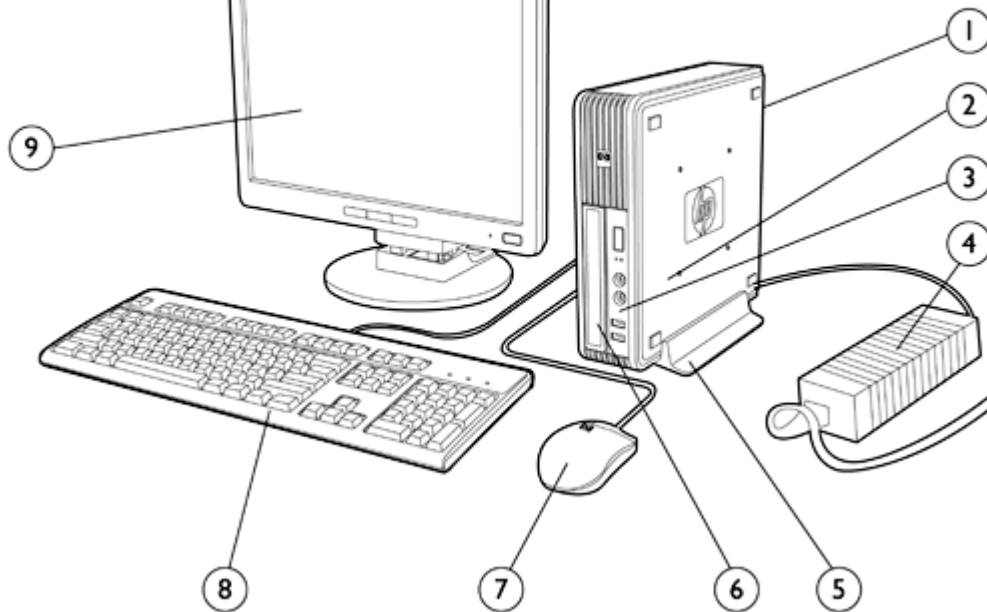


Overview

HP recommends
Windows Vista® Business

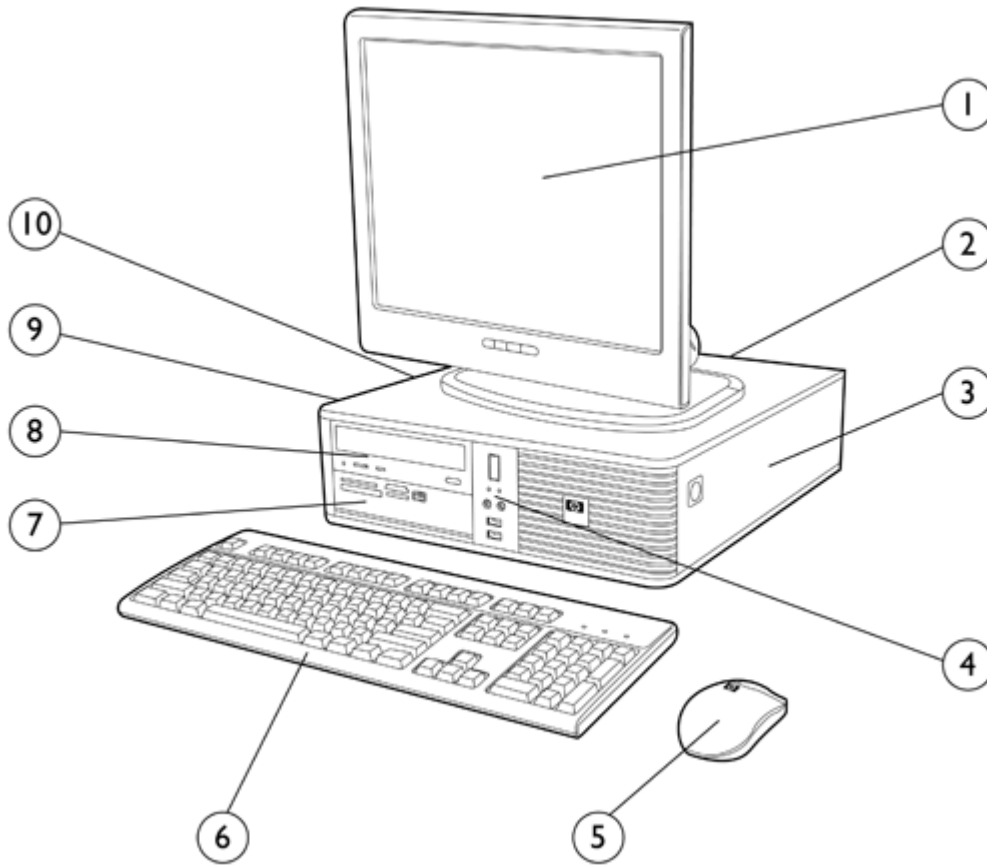
Ultra-slim Desktop



1. Rear I/O: (6) USB 2.0, (1) DisplayPort, (2) PS/2, (1) RJ-45, (1) VGA port, (1) audio in, (1) audio out
2. (1) 2.5" internal hard disk drive bay
3. Front I/O: (2) USB 2.0, headphone and microphone
4. 135W 87% efficient external power adapter
5. Tower stand (sold separately)
6. (1) Optical disk drive (slimline)
7. HP 2-button optical scroll mouse
8. HP keyboard
9. HP Monitor (sold separately)

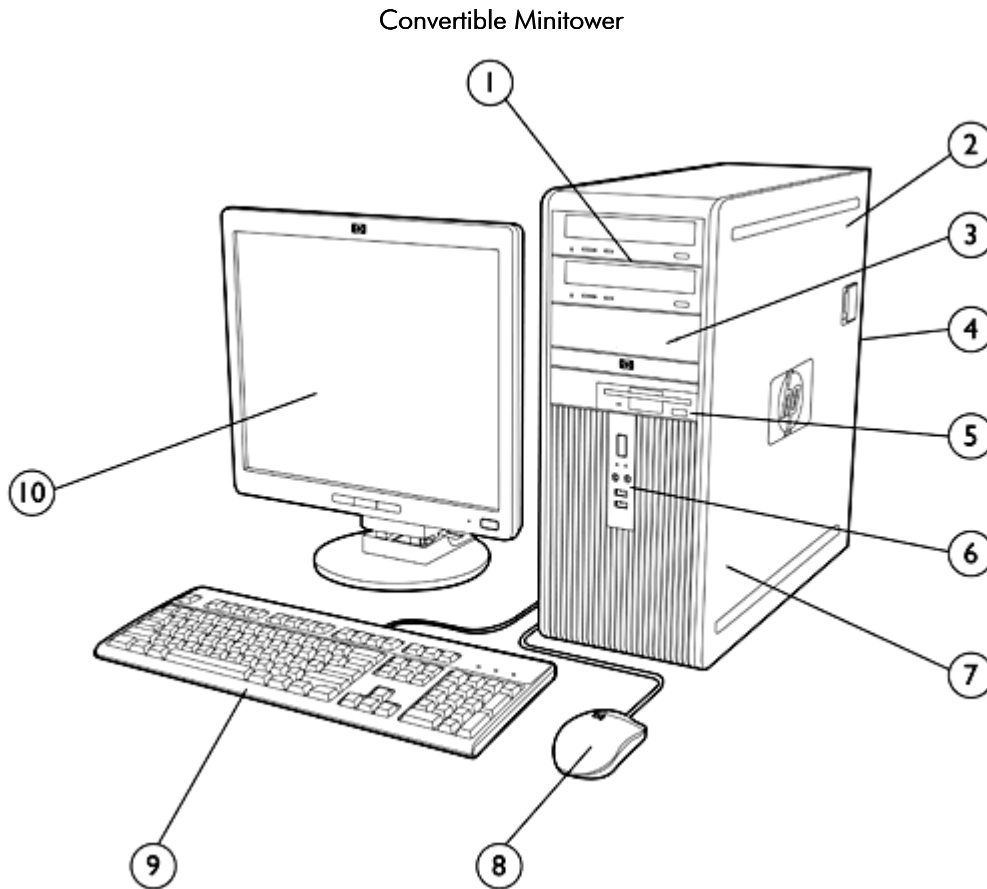
Overview

Small Form Factor



1. HP Monitor (sold separately)
2. Rear I/O: (6) USB 2.0, (1) serial port, (2) PS/2, (1) RJ-45, (1) VGA port, (1) DisplayPort, (1) audio in, (1) audio out
3. (1) low profile PCI slot, (1) low profile PCI Express x1 slot, (2) low profile PCI Express x16 slots
(NOTE: 2nd x16 slot has x4 connectivity.)
4. Front I/O: (2) USB 2.0, headphone and microphone
5. HP 2-button optical scroll mouse
6. HP keyboard
7. (1) 3.5-inch external drive bay supporting media card reader, diskette drive, or secondary hard disk drive
8. (1) Optical disk drive
9. (1) 3.5-inch internal drive bay supporting primary hard disk drive
10. 240-watt standard efficiency power supply
Optional: 85% efficient energy saving power supply

Overview



1. (2) Optical disk drives
(2) 3.5" internal hard disk drive bays
2. 365-watt standard efficiency power supply, Active Power Factor Correction (PFC)

Optional: 85% efficient energy saving power supply
3. (1) 5.25" removable media drive bay
4. Rear I/O: (6) USB 2.0, (1) serial port, (2) PS/2, (1) RJ-45, (1) VGA, (1) DisplayPort, (1) audio in, (1) audio out

Optional: 2nd serial port, (1) parallel port, (1) eSATA port
5. Media card reader or Floppy disk drive
6. Front I/O: (2) USB 2.0, headphone and microphone
7. (3) full-height PCI slots, (1) full-height PCI Express x1 slot, (2) full-height PCI Express x16 slots
(NOTE: 2nd x16 slot has x4 connectivity.)
8. HP 2-button optical scroll mouse
9. HP keyboard
10. HP Monitor (sold separately)

Overview

At A Glance

- Designed for long-term deployment within commercial and institutional organizations
- Guaranteed lengthy purchase lifecycles and image stability
- Integrated dual monitor support via both a VGA and DisplayPort monitor interface
- Optional 85% efficient power supplies
- ENERGY STAR qualification for dc7900e models
- Intel® Q45 Express chipset featuring Intel's Graphics Media Accelerator 4500
- Software image fully compatible across all models and form factors
- BIOS developed and engineered by HP for better security, manageability and software image stability
- Created using industry leading Design for Environment standards
- Supports industry standard management protocols including DASH, Intel Standard Manageability, and Intel Core 2 Processor with vPro Technology (on select models)
- CMT and SFF models can be configured with multiple hard disk drives in a RAID array
- Selected configurations with global availability easily set up and ordered through HP.com Business to Business portals (<http://h10019.www1.hp.com/business-site/index.html>)
- Tailored HP Factory Express deployment and lifecycle services available (<http://h71028.www7.hp.com/enterprise/cache/97688-0-0-225-121.aspx>)
- Protected by HP Services, including standard warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability features for easier upgrades and repairs
- Choice of professional chassis form factors to accommodate the desired mix between expandability and size

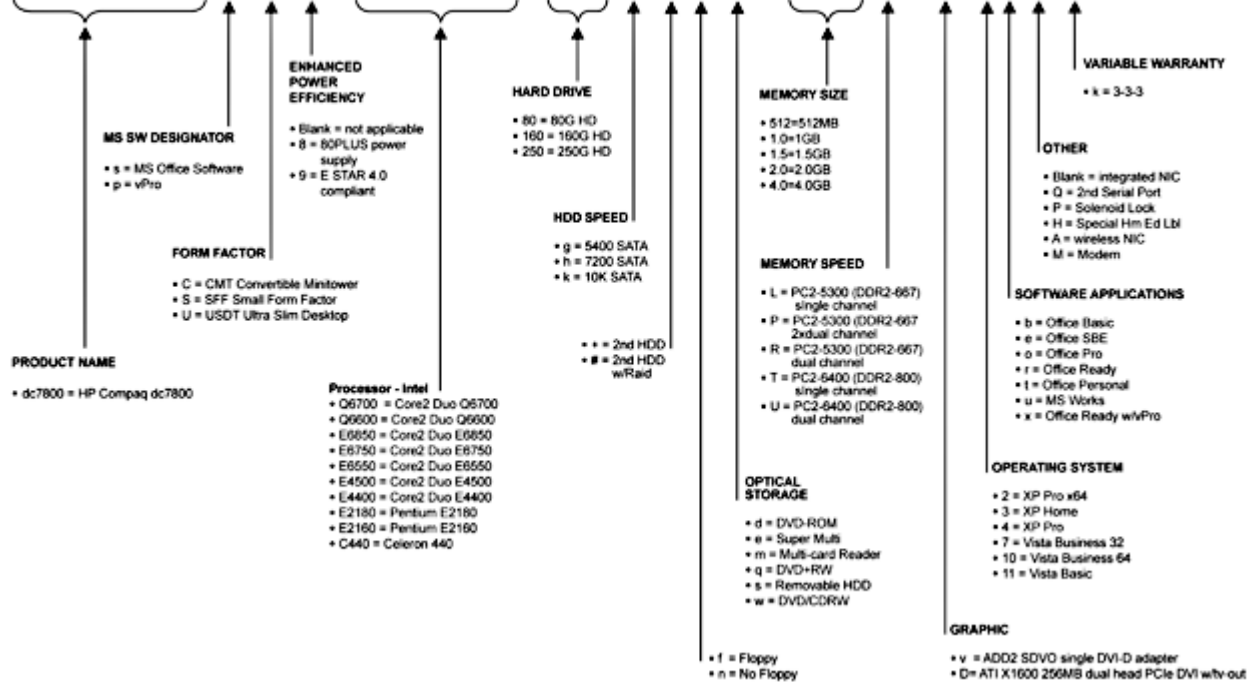
* TPM module and cryptographic software disabled where use is restricted by law; for example, Russia and China.

Configurable Components - Select Models (localized by Regions)

Model Key and Example

NOTE: This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.

dc7800sC8/E6700/80h+fw/1.0L/v4tPK



Standard Features and Configurable Components

Operating System - One of the following	Preinstalled	Genuine Windows Vista Business 32* Genuine Windows Vista Business 64* Genuine Windows Vista Home Basic 32* Genuine Windows Vista Ultimate 32* Genuine Windows Vista Business with downgrade to Windows XP Professional custom installed * † FreeDOS †
	Supported	Genuine Windows XP Home Edition Genuine Windows XP Professional
	Certified	SUSE Linux Enterprise Desktop †

* Certain Windows Vista product features require advanced or additional hardware. See: www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and www.microsoft.com/windowsvista/getready/capable.mspx for details. WindowsVista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: www.windowsvista.com/upgradeadvisor.

† Windows Vista Business disk may be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order at least 25 customer systems with the same custom image.

† The following features are not supported on Linux certified systems:

- HP 22-in-1 Media Card Reader
- HP 1.44-MB External USB Diskette Drive
- TPM 1.2 Security Chip
- Intel Pro 1000 PT PCIe x1 Gigabit NIC
- Broadcom NetXtreme Gigabit Ethernet Plus PCIe NIC
- HP 802.11b/g/n Wireless PCIe x1 Card (SFF and MT)
- Intel WiFi Link 5100 a/b/g/n (USDT) Wireless NIC
- Agere PCI 56K International SoftModem
- LSI PCIe x1 56K International SoftModem
- ATI Radeon 3470 256MB SH PCIe x16 graphics card
- ATI Radeon HD 2400XT 256MB DH PCIe x16 graphics card
- ATI Radeon HD 3650 512MB DH PCIe x16 graphics card
- NVIDIA Quadro NVS 290 256MB dual head graphics adapter
- HP USB Smartcard Keyboard
- HP 2nd Serial Port
- Parallel port adapter
- eSATA port adapter
- HP FireWire / IEEE 1394 PCI Card

Value-added Software (included with all models; not included with FreeDOS)

HP ProtectTools Security Suite †	HP Software Management Agent
HP Backup and Recovery Manager	PDF Complete
HP Insight Diagnostics	Computrace for Desktops (in the HP BIOS)*

† Not included on models configured with less than 1 GB system memory.

* Computrace agent is in HP BIOS. For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.

Standard Features and Configurable Components

Value-added Software (included with select models; not included with FreeDOS)

Computer Setup Utility
 McAfee Total Protection Anti-Virus†*
 Sonic/Roxio Easy Media Creator 9
 or
 Roxio Business Creator 10
 HP Power Manager v2.0
 HP Total Care Advisor†
 Microsoft Office 2007 Basic

Microsoft Office 2007 Personal
 Microsoft Office 2007 Professional
 Microsoft Office 2007 Small Business

Microsoft Works 8.5
 Firefox-HP Virtual Browser
 Corel WinDVD 8

† Not included on models configured with less than 1 GB system memory.

* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.

HP Client Management Solutions (available for free download from the Web <http://www.hp.com/go/easydeploy>)

HP Client Configuration Manager Basic Edition
 HP Client Manager for Altiris
 HP SoftPaq Download Manager
 HP Client Catalog for Microsoft SMS

HP Out-of-Band Management Console
 (for Intel management technology enabled models)
 Altiris Out-of-Band Management Solution (for Intel AMT enabled models)
 HP Systems Software Manager

Value-added Services and Features

HP Stable Platform Program
 Business-to-Business Portals
 HP Global Series Services
 TPM 1.2 security module*

Factory Express Deployment and Lifecycle Services
 Intel Standard Manageability
 Intel Core 2 processor with vPro Technology

* TPM module disabled where use is restricted by law; for example, Russia.

Service and Support

On-site Warranty and Service¹: This three-year (3-3-3), limited warranty and service offering delivers three years of parts, labor and on-site repair. Response time is next business-day² and includes free telephone support³ 24 x 7. Global coverage² ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor.

¹ Terms and conditions may vary by country. Certain restrictions and exclusions apply.

² On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

³ Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Dimensions			
Chassis Dimensions (H x W x D)	2.60 x 9.90 x 10 in (66.0 x 251.5 x 254 mm)	3.95 x 13.3 x 14.9 in (100.3 x 337.8 x 378.5)	17.63 x 7.0 x 17.8 in (447.8 x 177.8 x 452.12 mm)
Optional Tower Stand Dimensions (H x W x D)	1.26 x 4.82 x 6.69 in (32.0 x 122.3 x 170.0 mm)	1.05 x 6.95 x 7.83 in (26.75 x 176.46 x 198.87 mm)	N/A
System weight*	7.0 lb (3.18 kg)	18.75 lb (8.50 kg)	26.2 lb (11.89 kg)



Standard Features and Configurable Components

System volume	4.21 liters	13 liters	36 liters
Shipping weight*	14.34 lb (6.52 kg)	26.10 lb (11.86 kg)	34.60 lb (15.72 kg)
Maximum supported weight (desktop orientation)	77.1 lb (35 kg)	77.1 lb (35 kg)	77.1 lb (35 kg)
Shipping box dimensions (H x W x D)	8.60 x 15.68 x 19.68 in (218.4 x 398.3 x 499.9 mm)	9.00 x 19.68 x 23.38 in (228.6 x 499.9 x 593.85 mm)	24.25 x 12.33 x 22.13 in (616.0 x 313.2 x 562.1 mm)
* Configured with 1 hard drive, 1 optical drive, no diskette drive, and no PCI card.			
	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Standard Efficiency Power Supply	N/A	240W active PFC	365W active PFC
Energy Efficient Power Supply	135W active PFC 87% efficient	240W active PFC 85% efficient	365W active PFC 85% efficient
	External power supply dimensions: 6.7 x 2.6 x 1.5 in Total length of external power supply and power cord: 12 feet 8 inches		
Ports			
USB 2.0	(8) Total (2) front, (6) rear		
Serial	N/A	(1) Standard Optional 2 nd port available	
Parallel	N/A	Optional (1)	
eSATA	N/A	Optional (1)	
PS/2	(1) keyboard; (1) mouse		
Video	(1) VGA; (1) DisplayPort		
DVI output	available via optional DisplayPort to DVI adapter		
Support for Multi-Monitor	Dual monitor support standard; > 2 via optional graphics cards		
Audio	Front – mic and headphone Rear – input (supports microphone or line input), line out		
NIC (RJ-45)	Integrated Intel 82567LM GbE Network Connection		
Slots			
Type and quantity	(1) mini PCI Express	(1) PCI (1) PCI Express x1 (2) PCI Express x16	(3) PCI (1) PCI Express x1 (2) PCI Express x16
Slot specifications		<ul style="list-style-type: none"> Accommodates low profile cards only Graphics slots support 35W cards 2nd PCIe x16 slot functions electrically as a x4 	<ul style="list-style-type: none"> Accommodates full height cards 1st graphics slot supports 75W card; 2nd graphics slot support 35W card 2nd PCIe x16 slot functions electrically as a x4

Chipset	Intel Q45 Express chipset featuring Intel GMA 4500 DirectX 10 graphics	USDT	SFF	CMT
		X	X	X

Standard Features and Configurable Components

Processor and Speed* One of the following	Intel Celeron Dual-Core Processors: Intel Celeron dual-core E1200 processor 1.6 GHz, 512 KB L2 cache, 800 MHz FSB	X	X	X
	Intel Celeron dual-core E1400 processor 2.0 GHz, 512 KB L2 cache, 800 MHz FSB	X	X	X
	Intel Pentium dual-core Processors: Intel Pentium dual-core E5200 processor 2.5 GHz, 2 MB L2 cache, 800 MHz FSB	X	X	X
	Intel Core 2 Duo Processors: Intel Core 2 Duo E7200 processor 2.53 GHz, 3 MB L2 cache, 1066 MHz FSB			
	Intel Core 2 Duo E7300 processor 2.66 GHz, 3 MB L2 cache, 1066 MHz FSB	X	X	X
	Intel Core 2 Duo E8400 processor 3.0 GHz, 6 MB L2 cache, 1333 MHz FSB Featuring Core 2 Processor with vPro Technology	X	X	X
	Intel Core 2 Duo E8500 processor 3.16 GHz, 6 MB L2 cache, 1333 MHz FSB Featuring Core 2 Processor with vPro Technology	X	X	X
	Intel Core 2 Duo E8600 processor 3.33 GHz, 6 MB L2 cache, 1333 MHz FSB Featuring Core 2 Processor with vPro Technology	X	X	X
	Intel Core 2 Quad Processors: Intel Core 2 Quad Q8200 processor 2.33 GHz, 4 MB L2 cache, 1333 MHz FSB		X	X
	Intel Core 2 Quad Q9400 processor 2.66 GHz, 6 MB L2 cache, 1333 MHz FSB Featuring Core 2 Processor with vPro Technology		X	X
	Intel Core 2 Quad Q9550 processor 2.83 GHz, 12 MB L2 cache, 1333 MHz FSB Featuring Core 2 Processor with vPro Technology		X	X
	Intel Core 2 Quad Q9650 processor 3.0 GHz, 12 MB L2 cache, 1333 MHz FSB Featuring Core 2 Processor with vPro Technology		X	X

Intel Core 2 Processor with vPro Technology	All dc7900 Series models featuring this technology include processors which are part of the Intel 2008 Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the HP Compaq dc7900 Series business desktop, thus making these model the most stable, secure, and manageable platforms available to enterprises today.	X	X	X
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The 2008 SIPP processors are:

- Core 2 Duo E8400, E8500, E8600
- Core 2 Quad Q9400, Q9550, Q9650

Intel's Core 2 Processor with vPro Technology suite of features includes:



Standard Features and Configurable Components

- **Intel Active Management Technology**
an advanced set of remote management features and functionality which provides network administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. Intel Active Management Technology includes all features described as part of Intel Standard Manageability plus the following advanced management functions:
 - **Fast Call for Help** – a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection
 - **Remote Scheduled Maintenance** – pre-schedule when the PC connects to the IT or service provider console for maintenance. Remote PCs can get required patches, be inventoried, etc by connecting to their IT console or Service Provider when it's convenient
 - **Remote Alerts** – automatically alert IT or service provider if issues arise
 - **Access Monitor** – Provides oversight into Intel® AMT actions to support security requirements
- **Microsoft NAP Support**
Allows Intel Active Management Technology to gain access to a Microsoft NAP enabled 802.1x network OOB to enable OOB SW updates, inventories, remote diagnostics, etc. NAP is a new platform and solution that controls access to network resources based on a client computer's identity and compliance with corporate governance policy. NAP allows network administrators to define granular levels of network access based on who a client is, the groups to which the client belongs, and the degree to which that client is compliant with corporate governance policy. If a client is not compliant, NAP provides a mechanism to automatically bring the client back into compliance and then dynamically increase its level of network access.

When a client attempts to access the network or communicate on the network, it must present its system health state or proof of health compliance. If a client cannot prove it is compliant with system health requirements (for example, that it has the latest operating system and antivirus updates installed), its access to the network or communication on the network can be limited to a restricted network containing server resources so that health compliance issues can be remedied. After the updates are installed, the client requests access to the network or attempts the communication again. If compliant, the client is granted unlimited access to the network or the communication is allowed.

Memory

DDR2 SYNCH DRAM NON-ECC MEMORY

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The HP Compaq dc7900 business desktop supports non-ECC DDR2 PC2-5300 (667-MHz) and PC2-6400 (800-MHz) memory.

CAUTION: You must shut down the computer and disconnect the power cord before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system

Standard Features and Configurable Components

board.

HP recommends dual-channel symmetric configurations for maximum performance.

For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

RAID

Redundant Array of Independent Drives

Flexible implementation:

- DriveLock is supported while in RAID mode. Users can manage DriveLock password from within F10 Setup. Locked drives will be displayed as such in the RAID option ROM interface.
- Hard drive information can be viewed within F10 Setup while in RAID mode. Previously, the hard drives will not appear in Drive Configuration when switching to RAID mode.
- DPS Self Test can be executed on physical hard drives while in RAID mode.
- The RAID Setup Utility (accessed through CTRL-I) can be protected by the F10 Setup password.

NOTE: RAID 1 is the only RAID configuration that HP Compaq dc7900 Business PC products offer as factory configurations. The pre-configured systems:

- Are only available on the CMT and SFF form factors. The USDT does not support RAID as it does not allow for more than one hard disk drive.
- Are complete RAID systems and have both drives installed.
- Have the necessary Option ROM configuration.
- Are pre-loaded and pre-installed with all required Intel software.
- Include a preinstalled operating system that is mirrored mode out of the box.

Please refer to the HP White Paper titled "Advanced Host Controller Interface (AHCI) and Redundant Array of Independent Disks (RAID) on HP Compaq dc7900 Business PCs" at <http://www.hp.com> for more information and instructions.

Ultra-slim Desktop

Maximum Memory*

Supports up to 8 GB of DDR2 SYNCH DRAM using SO-DIMM modules. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements.

SO-DIMM Size	Slot	
	Channel A	Channel B
	1 (black)	2 (white)
512-MB	512-MB	
1-GB	1-GB	
2-GB (dual-channel symmetric)	1-GB	1-GB
4-GB (dual channel symmetric)	2-GB	2-GB
8-GB maximum (dual channel symmetric)	4-GB	4-GB

Standard Features and Configurable Components

* The Intel Q45 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the PC contains a single SO-DIMM, 16 MB of memory is pre-allocated for it at system startup. If the PC contains two SO-DIMMs, 32 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.

Small Form Factor and Convertible Minitower

Maximum Memory*

Supports up to 16 GB of DDR2 SYNCH DRAM using DIMM modules. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

DIMM Size	Slot			
	Channel A		Channel B	
	1 (black)	2 (white)	3 (white)	4 (white)
512-MB	512-MB			
1-GB	1-GB			
2-GB (dual-channel symmetric)	1-GB		1-GB	
4-GB (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB
8-GB (dual-channel symmetric)	2-GB	2-GB	2-GB	2-GB
16-GB maximum (dual-channel symmetric)	4-GB	4-GB	4-GB	4-GB

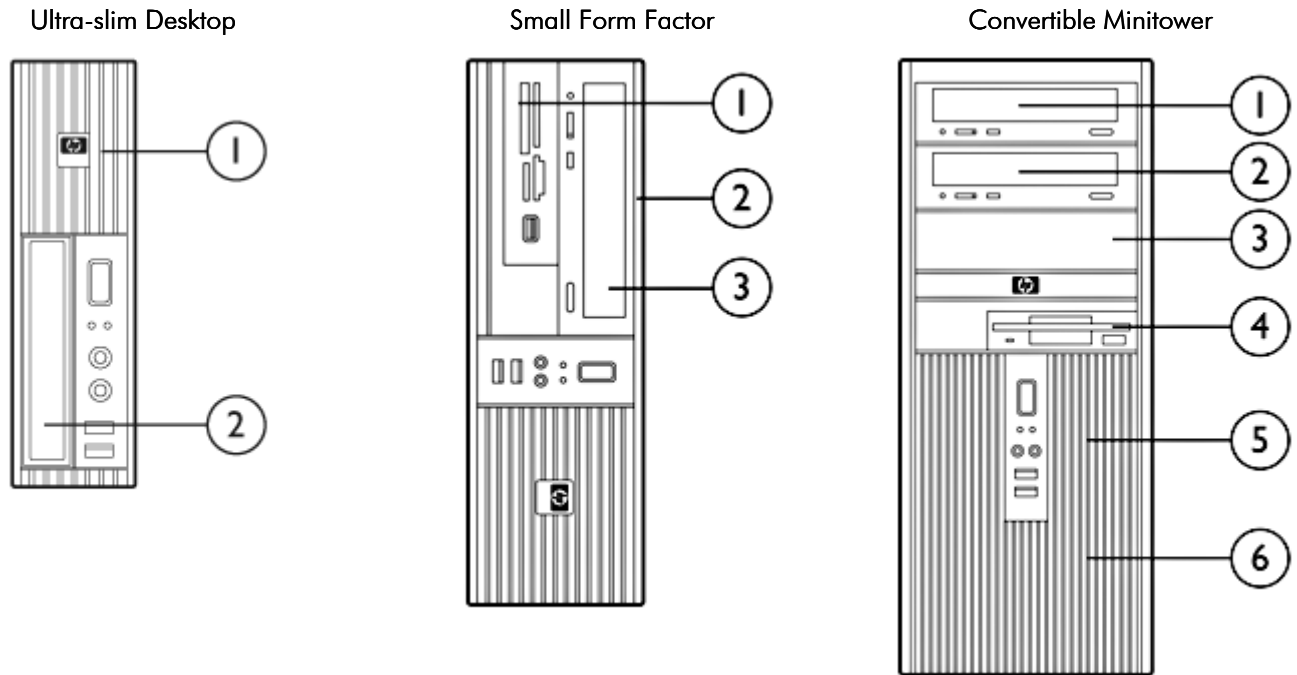
* The Intel Q45 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the PC contains a single DIMM, 16 MB of memory is pre-allocated for it at system startup. If the PC contains two DIMMs, 32 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.

Memory Configurations –	USDT	SFF	CMT
512-MB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 512)	X	X	X
One of the following			
1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 1GB)	X	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 2GB)	X	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 1GB)	X	X	X
3-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (3 x 1GB)		X	X
4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 1GB)		X	X
4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 2GB)	X	X	X
8-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 2GB)		X	X
16-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 4GB)		X	X

Standard Features and Configurable Components

Expandability	USDT	SFF	CMT
PCI slots	N/A	(1) LP (2.5"), length (6.6") standard; (2) FH (4.2"), length (6.875") via optional riser card. NOTE: With optional riser card, PCIe x1 and PCIe x16 slots are not accessible.	(3) FH (4.2"), length (10.5")
Max power per slot	N/A	25W	25W
PCI Express x16 slot	N/A	(2) LP (2.5"), length (6.6")	(2) FH (4.2"), full-length
Max power per slot	N/A	35W	75W max if 1 16x slot, 35W each if both PCIe 16 slots
PCI Express x1 slot	N/A	(1) LP (2.5"), length (6.6")	(1) FH (4.2"), full-length
Max power per slot	N/A	10W	10W
External Bays	(1) Total	(2) Total	(4) Total
3.5"	N/A	(1) unless used for a secondary hard drive	(1)
5.25"	N/A	(1) 8.189" length	(2) 8.189" length (1) 5.71" length
Slimline	128w x 127d x 12.7h mm	N/A	N/A
Internal 2.5" HDD Bays	(1)	N/A	N/A
Internal 3.5" HDD Bays	N/A	(1) for primary hard drive NOTE: Secondary hard drive can be installed in 3.5" external bay if not used for external device.	(2) dedicated for HDDs NOTE: A third hard drive can be installed in 3.5" external bay if not used for external device.
Hard Drive Controller (PCI) Supported	Serial ATA support for SATA 1.5-Gb/s and 3.0-Gb/s hard drives		
Hard Drive and Optical SATA Interfaces Supported	(1) Serial ATA interface	(3) Serial ATA interfaces (1) Serial ATA for eSATA	(4) Serial ATA interfaces (1) Serial ATA for eSATA
Host Controller for SATA	Advanced Host Controller Interface (AHCI) Revision 1.2. The specification includes a description of the hardware/software interface between system software and the host controller hardware.		

Standard Features and Configurable Components



Storage - Drive Support

	USDT		SFF			CMT		
	Slimline Optical Drives	2.5" Hard Disk Drive or Solid State Drive (right angle, no cable)	Diskette Drive or Media Card Reader	5.25" Optical Drives	Hard Disk Drives	Diskette Drive or Media Card Reader*	5.25" Optical Drives	Hard Disk Drives
Quantity Supported	1	1	1	1	2	1	2	3
Position Supported	②	①	①	②	①, ③	④	①, ②	②, ⑤, ⑥
Controller	SATA	SATA	Diskette Controller or USB header on PCA	SATA	SATA	Diskette Controller or USB header on PCA	SATA	SATA

* To have both a diskette drive and a media card reader in the Convertible Minitower, it is necessary to order it with a diskette drive in position 4 and then purchase a media card reader as an after-market option kit (which contains a 5.25" bracket) and install it in position 3.

Standard Features and Configurable Components

		USDT	SFF	CMT
Hard Drives (SATA)	<u>80 GB Hard Drive (2.5")</u> 8MB cache, 7200 RPM, 3.0 GB/s, NCQ, Smart IV	X		
	<u>160 GB Hard Drive (2.5")</u> 8MB cache, 7200 RPM, 3.0 GB/s, NCQ, Smart IV	X		
	<u>250 GB Hard Drive (2.5")</u> 8MB cache, 7200 RPM, 3.0 GB/s, NCQ, Smart IV	X		
	<u>80 GB Hard Drive</u> 8MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X
	<u>80 GB Hard Drive</u> 16MB cache, 10,000 RPM, 3.0 GB/s, NCQ, Smart III		X	X
	<u>80 GB Hard Drive (removable)</u> 8MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X
	<u>160 GB Hard Drive</u> 8MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X
	<u>160 GB Hard Drive</u> 16MB cache, 10,000 RPM, 3.0 GB/s, NCQ, Smart III		X	X
	<u>160 GB Hard Drive (removable)</u> 8MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X
	<u>250 GB Hard Drive</u> 8MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X
	<u>250 GB Hard Drive (removable)</u> 8MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X
	<u>500 GB Hard Drive</u> 16MB cache, 7,200 RPM, 3.0 GB/s, NCQ, Smart IV		X	X

Removable Storage –
One or more of the following depending on form factor (see Storage – Drive Support section above)

Diskette Drives

1.44-MB Diskette Drive

X X

5.25" Optical Drives (SATA)

DVD-ROM Drive

X X

SuperMulti LightScribe DVD Writer Drive^{1,2,3}

X X

Slimline Optical Drives (SATA)

DVD-ROM Drive¹

X

SuperMulti LightScribe DVD Writer Drive^{1,2,3}

X

¹ For playing DVDs, Corel WinDVD 8

² For writing CDs, choice of Sonic/Roxio Easy Media Creator 9 or Roxio Business Creator 10

³ For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio Easy Media Creator 9

or

Roxio Business Creator 10

Standard Features and Configurable Components

Media Card Reader – One of the following	HP 22-in-1 Media Card Reader	X	X
	HP 22-in-1 Media Card Reader with 1394 port	X	X

Security	TPM 1.2 TPM Security Chip*	X	X	X
	TPM Pre-Boot Authentication (via BIOS)	X	X	X
	Smartcard Pre-boot Authentication (via BIOS)	X	X	X
	Stringent Security** (via BIOS)	X	X	X
	SATA port disablement (via BIOS)	X	X	X
	Drive Lock	X	X	X
	RAID configurations		X	X
	HP ProtectTools Embedded Security Software	X	X	X
	Serial, Parallel, USB Enable/Disable (via BIOS)	X	X	X
	Optional USB Port Disable at factory (user configurable via BIOS)	X	X	X
	Removable Media Write/Boot Control	X	X	X
	Power-On Password (via BIOS)	X	X	X
	Setup Password (via BIOS)	X	X	X
	Solenoid Hood Lock / Sensor	X	X	X
	HP Security Lock Kit	X	X	X
Support for chassis padlocks and cable lock devices	X	X	X	

* TPM module disabled where use is restricted by law; for example, Russia.

** This setting is defaulted to disable, but when enabled, the PW jumper will not clear the BIOS pre-boot authentication passwords.

NIC	Intel 82567LM GbE Network Connection (integrated on system board)	X	X	X
	Intel Gigabit CT Desktop NIC *		X	X
	Broadcom NetXtreme Gigab Ethernet + NIC AV FS601AV			

NOTE: The integrated network connection is required to support the vPro technology features.

* Available after initial product release; use of this network card disables the vPro technology features.

Wireless	HP 802.11 b/g/n PCIe x1 Wireless card		X	X
	Intel WiFi Link 5100 a/b/g/n (USDT) Wireless NIC	X		

NOTE: These wireless network solutions disable the vPro technology features.

Modem	Agere 2006 PCI 56K International SoftModem		X	X
	LSI PCIe x1 Hi-Speed 56K International SoftModem		X	X

Standard Features and Configurable Components

Graphics	Intel Graphics Media Accelerator 4500 (integrated on chipset)	X	X	X
	ATI Radeon 3470 256MB SH PCIe x16 graphics card		X	X
	ATI Radeon HD 2400XT 256MB DH PCIe x16 graphics card		X	X
	ATI Radeon HD 3650 512MB DH PCIe x16 graphics card			X
	NVIDIA Quadro NVS 290 256MB DH PCIe x16 graphics card		X	X

Audio	Integrated HD audio with AD1884A codec (all ports are stereo)	X	X	X
	Microphone and Headphone front ports	X	X	X
	Line-out and Line-In rear ports*	X	X	X
	Multistreaming capable*	X	X	X
	Internal Speaker (standard)	X	X	X
	HP Thin USB Powered Speakers	X	X	X

* Rear audio input ports are re-taskable as Line-in or Microphone-in. External speakers must be powered externally. Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks. This allows for different audio applications to use separate audio ports on the system. For example, the front jacks could be used with a headset for a communications application while the rear jacks are being used with external speakers and a multimedia application.

Input Devices	Keyboard			
	HP PS/2 Standard Keyboard	X	X	X
	HP USB Standard Keyboard	X	X	X
	HP USB Smartcard Keyboard	X	X	X
	Mouse - One of the following			
	HP PS/2 2-button Optical Scroll Mouse	X	X	X
	HP USB 2-button Optical Scroll Mouse	X	X	X
HP USB 2-Button Laser Scroll Mouse	X	X	X	

Miscellaneous	HP FireWire (IEEE 1394) PCI Card		X	X
	PCI riser card for SFF - adds 2 full-height PCI slots		X	
	NOTE: Low profile slots are unusable with riser card installed.			
	Serial port adapter		X	X
	Parallel port adapter		X	X
	eSATA port adapter		X	X
	Tower stand	X	X	
	Configure dc7900 CMT in desktop orientation			X
Rear Port Control Cover	X			

After-Market Options (availability may vary by region)

		USDT	SFF	CMT	After-Market Options Part Number
Office 2007 Media-less License Kits (MLKs)	MS Office Basic Edition 2007 – Media-less License Kit	X	X	X	RZ361A#ABA
	MS Office Small Business Edition 2007 – Media-less License Kit	X	X	X	RZ365A#ABA
	MS Office Professional Edition 2007 – Media-less License Kit	X	X	X	RZ363A#ABA
<hr/>					
Communications	Wireless				
	HP Wireless 802.11 b/g/n PCIe x1		X	X	FH971AA
	NICs				
	Broadcom NetXtreme Gigabit Ethernet Plus PCIe NIC		X	X	FS215AA
	Intel PRO/1000 CT Network Connection (GbE PCIe x1 NIC)		X	X	FH969AA (launching 3/30/09)
	Modem				
	LSI PCIe x1 Hi-Speed 56K International SoftModem		X	X	FH970AA
Connectivity					
Bundle Connectivity Starter Kit – Surge Protector/LAN cable/Printer cable		X	X	RT174AA	
* available after initial product release					
NOTE: The use of a PCI Express network card (wired or wireless) will disable the vPro technology features.					
<hr/>					
Graphics	Single head solutions				
	ATI Radeon 3470 256MB SH PCIe x16		X	X	FH972AA
	Multi head solutions				
	ATI Radeon HD 2400XT 256MB DH PCIe x16		X	X	KD060AA
	ATI Radeon HD 3650 512MB DH PCIe x16			X	KS505AA
ATI HD 4550 PCIe x16 (256GB/DDR3) Dual Head Graphics Card		X	X	AT042AA (launching May 09)	
<hr/>					

After-Market Options (availability may vary by region)

Hard Disk Drives	Serial ATA Hard Drives				
	HP 80-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	X	X		PY276AA
	HP 160-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	X	X		PY277AA
	HP 250-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	X	X		PY278AA
	HP 320-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	X	X		FH963AA
	HP 500-GB SATA (NCQ/Smart IV) 3.0-Gb/s HDD	X	X		KW347AA
	HP eSATA Adapter	X	X		FH966AA
	HP Removable SATA Hard Drive Enclosure (Frame & Carrier)	X	X		RY102AA
	HP Removable SATA Hard Drive Enclosure (Carrier Only)	X	X		RY103AA
Input/Output Devices	Wireless Keyboard and Mouse				
	2.4 GHz Wireless Keyboard and Mouse	X	X	X	NB896AA
	Keyboards				
	HP PS/2 Standard Keyboard	X	X	X	DT527A
	HP USB Standard Keyboard	X	X	X	DT528A
	HP USB Mini Keyboard	X	X	X	AS601AA (launching 3/30/09)
	Pointing Devices				
	HP PS/2 2-Button Optical Scroll Mouse	X	X	X	EY703AA
	HP USB 2-Button Optical Scroll Mouse	X	X	X	DC172B
	HP USB 2-Button Laser Mouse	X	X	X	GW405AA
Memory (non-ECC)	PC2-6400 (DDR2, 800 MHz) DIMM				
	Promo - 2GB (2 x 1GB) PC2-6400 DDR2-800	X	X	X	NQ604AT
	Promo - 4GB (2 x 2GB) PC2-6400 DDR2-800	X	X	X	NQ605AT
	HP 1 GB PC2-6400 (DDR2 800 MHz) DIMM		X	X	AH058AA
	HP 2 GB PC2-6400 (DDR2 800 MHz) DIMM		X	X	AH060AA
	HP 4 GB PC2-6400 (DDR2 800) DIMM		X	X	FH977AA
	PC2-6400 (DDR2, 800 MHz) SODIMM				
	HP 1 GB PC2-6400 (DDR2 800 MHz) SODIMM	X			GM254AA
	HP 2 GB PC2-6400 (DDR2 800 MHz) SODIMM	X			GV576AA
	HP 4 GB PC2-6400 (DDR2 800 MHz) SODIMM	X			FH978AA
Monitors	CRTs				
	3PO Offering				
	Business LCD Monitors				
	HP L1506 15-inch LCD Monitor				PX848AA#ABA
	HP w15v 15-inch Widescreen LCD Monitor				FM745AA#ABA
	HP w17e 17-inch LCD Monitor				GV537AA#ABA
	HP L1710 17-inch LCD Monitor				GS917AA#ABA
HP L1910 19-inch LCD Monitor				GS918AA#ABA	

After-Market Options (availability may vary by region)

HP L1910i 19-inch LCD Monitor with Integrated Work Stand	GS581AA#ABA
HP L1908w 19-inch Widescreen LCD Monitor	GP536AA#ABA
HP L1908wm 19-inch Widescreen LCD Monitor with multimedia	KA214AA#ABA
HP L1908wi 19-inch Widescreen LCD Monitor with Integrated Work Stand	GP537AA#ABA
HP L2208w 22-inch Widescreen LCD Monitor	GX007AA#ABA
Advantage Series Monitors	
HP L1745 17-inch LCD Monitor	GE178AA#ABA
HP L1750 17-inch LCD Monitor	GF904AA#ABA
HP L1750 17-inch LCD Monitor - TAA Compliant	GF904A2#ABA
HP L1950g 19-inch LCD Monitor	KR145AA#ABA
HP L1950g TAA 19-inch LCD Monitor - TAA Compliant	KR145A2#ABA
HP L1945w 19-inch Widescreen LCD Monitor	KD286AA#ABA
HP L2045w 20-inch Widescreen LCD Monitor	RD125AA#ABA
HP L2245wg 22-inch Widescreen LCD Monitor	FL472AA#ABA
HP L2445w 24-inch Widescreen LCD Monitor	KT931AA#ABA
Performance Series Monitors	
HP LP1965 19-inch LCD Monitor	RA373AA#ABA
HP LP2065 20-inch LCD Monitor	EF227A4#ABA
HP LP2275 22-inch Widescreen LCD Monitor	KE289A4#ABA
HP LP2275 22-inch Widescreen LCD Monitor Bulk Pack (6 baseless units)	KD289A6#ABA
HP LP2475w 24-inch Widescreen LCD Monitor	KD911A4#ABA
HP LP2480zx 24-inch DreamColor Widescreen LCD Monitor	GV546A4#ABA
HP LP3065 30-inch Widescreen LCD Monitor	EZ320A4#ABA
Digital Signage	
HP LD4200 42-inch LCD Monitor	NH322AA#ABA (launching March 9th)
Touchscreen Monitor	
HP L5006tm 15-inch Touch Screen LCD Monitor	RB146AA#ABA
Options	
HP Flat Panel Speaker Bar	EE418AA
HP Quick Release Kit	EM870AA
HP Integrated Work Stand (stand alone)	GN783AA
HP DreamColor Advanced Profiling Solution (aka Puck)	KZ300AA
HP LCD Hood Kit	KZ301AA
3M 17-in Privacy Screen Filter	KM218AA
3M 19-in Privacy Screen Filter	KZ310AA
Digital Signage Speaker	NK352AA (launching March 9th)
Digital Signage Stand	NK353AA (launching March 9th)

After-Market Options (availability may vary by region)

Multimedia	HP Thin USB Powered Speakers	X	X	X	KK912AA
	Wired Premium Headset (VoIP and Overture Conf)	X	X	X	AQ704AA
Slimline Optical Drives	DVD-ROM Drive				
	HP Slim 8X SATA DVD-ROM Drive	X			FH967AA
	Combo Drive				
	HP Slim 24X SATA CD-RW/DVD-ROM Combo Drive	X			KV842AA
DVD Writer					
	HP Slim 8X SATA SuperMulti LightScribe Drive	X			KV843AA
Standard Optical Drives	DVD-ROM Drive				
	HP SATA DVD-ROM Drive		X	X	AH047AA
	DVD Writer				
	HP SATA SuperMulti LightScribe DVD Writer Drive		X	X	GF343AA
Removable Storage	Diskette and Digital Drives				
	HP 1.44-MB External USB Diskette Drive	X	X	X	DC141B
	HP 1.44-MB Standard Internal Diskette Drive		X	X	AH053AA
	Multimedia				
	HP 22-in-1 Media Card Reader with FireWire (IEEE 1394)		X	X	KN518AA
Security	Kensington Lock	X	X	X	PC766A
	HP Business PC Security Lock	X	X	X	PV606AA
	HP Chassis Security Kit	X	X	X	AR639AA
	HP Rear Port Controller Cover (USDT)	X			GJ121AA
	HP (SFF) Solenoid Lock/Hood Sensor		X		GJ116AA
	HP (CMT) Solenoid Lock/Hood Sensor			X	DE618A
	HP 2008 Wall Mount/Security Sleeve (SFF)			X	GF344AA
	HP ProtectTools Version 4.0 (1 User)	X	X	X	FH974AA
	HP USB Smartcard Keyboard	X	X	X	ED707AA

After-Market Options (availability may vary by region)

Software	HP Client Configuration Manager, Premium Edition	X	X	X	T3488AA (use T3489AA for 1000 licenses)
	Altiris Client Management Suite Level 1 Includes: Altiris Deployment Solution Altiris Inventory Solution Altiris Application Metering Solution Altiris Carbon Copy Solution Altiris Software Delivery Solution Altiris Application Management Solution Altiris Patch Management Solution	X	X	X	DR605A (use DR606A for 1000+ licenses)
Brackets/Stand	HP Compaq Integrated Work Center Stand	X			GN783AA
	HP Tower Stand for USDT	X			GJ117AA
	HP Tower Stand for SFF		X		GJ118AA
Miscellaneous Accessories	HP USB Graphics Adapter	X	X	X	NL571AA
	DisplayPort TO VGA Adapter	X	X	X	AS615AA (launching 3/30/09)
	DisplayPort TO DVI-D Dual Link Adapter (WKS offering)	X	X	X	NR078AA (launching May 09)
	HP DMS59 DVI Dual-head Connector Cable		X	X	DL139A
	HP DVI to DVI Cable		X	X	DC198A
	HP DisplayPort To DVI-D Adapter	X	X	X	FH973AA
	HP Serial Port adapter kit		X	X	PA716A
	HP Parallel Port Adapter		X	X	KD061AA
	Belkin USB to Serial Adapter	X	X	X	EM449AA
	SFF PCI Riser Card		X		AR954AA
	HP 5.25" Blank Bezel Kit (50 pack)		X	X	DC177B
	HP FireWire (IEEE 1394) PCI Card		X	X	PA997A
	Cat5e Patch Cable	X	X	X	AH122AA
	Firewire (1394) Cable	X	X	X	AH123AA
	7-outlet Surge Protector	X	X	X	AG290AA#ABA
HP 1TB Media Vault Pro MV5140	X	X	X	GX667AA#ABA	
HP 1.5 TB Media Vault Pro MV 5150	X	X	X	GX668AA#ABA	

Technical Specifications

Unit Environment and Operating Conditions	Ultra-slim Desktop	Small Form Factor	Convertible Minitorer
General Unit Operating Guidelines			
<ul style="list-style-type: none"> Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow. Never restrict airflow into the computer by blocking any vents or air intakes. Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air. Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow. If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply. 			
Temperature Range	Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F (-30° to 60° C)		
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)		
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)		
* Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.			

Power Supply	Ultra-slim Desktop	Small Form Factor	Convertible Minitorer
Standard Efficiency	N/A	240W standard efficiency active PFC	365W standard efficiency active PFC
Energy Efficient	135W 87% efficient active PFC (external)	240W 85% efficient active PFC	365W 85% efficient active PFC
Operating Voltage Range	90 – 264 VAC	90 – 264 VAC	90 – 264 VAC
Rated Voltage Range	100 – 240 VAC	100 – 240 VAC	100 – 240 VAC
Rated Line Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz
Rated Input Current	N/A	4A	6A
Rated Input Current with Energy Efficient* Power Supply	1.5A	3.5A	5A
Current Leakage (NFPA 99)	< 275 μ A	< 275 μ A	< 450 μ A
System Heat Dissipation	N/A	Typical 198 btu/hr (50 kg-cal/hr) Maximum 1260 btu/hr (318 kg-cal/hr)	Typical 222 btu/hr (56 kg-cal/hr) Maximum 1916 btu/hr (483 kg-cal/hr)
System Heat Dissipation with Energy Efficient* Power Supply	Typical 133 btu/hr (33.5 kg-cal/hr) Maximum 549 btu/hr (132 kg-cal/hr)	Typical 150 btu/hr (38 kg-cal/hr) Maximum 1024 btu/hr (258 kg-cal/hr)	Typical 171 btu/hr (43 kg-cal/hr) Maximum 1557 btu/hr (392 kg-cal/hr)
	Ultra-slim Desktop	Small Form Factor	Convertible Minitorer
Power Supply Fan	N/A	80mm variable speed	92mm variable speed

Technical Specifications

FEMP Standby Power Compliant (<2W in S5 – Power Off)*	X	X	X
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	< 2.7W	< 2.7W	< 2.7W
* Energy efficient power supply is a requirement for ENERGY STAR qualification in conjunction with a select range of processors and modules; ENERGY STAR models branded HP Compaq dc7900e			

ROM BIOS Information

Key features of the HP BIOS in the dc7900 include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Business desktop computer into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Select models feature either Intel Standard Manageability or Core 2 processor with vPro Technology.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Security – HP BIOS Configuration for ProtectTools offers a robust and flexible set of security features to help the system administrator secure their systems from removal of sensitive data, and help prevent access by unauthorized users.
- Computrace agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Business Desktop computer in any enterprise environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash, SSM), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.

Additional HP BIOS Features

- Power-On password – Helps prevent an unauthorized user from powering on the system. After a TPM Basic User password is established in windows, the user or admin can require TPM hardware based authentication during the power-on process.
- Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP Compaq dc7900 models use ACPI to provide power conservation features.

Technical Specifications

Other Features	Description
ACPI-Ready Hardware	Advanced Configuration and Power Management Interface (ACPI). <ul style="list-style-type: none"> • Allows the system to wake from a low power mode. • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
SMBIOS Ver. 2.5	System Management BIOS, for system management information
Wired for Management Support	Intel-driven, industry-wide initiative to make Intel architecture-based PCs, servers and mobile computers more inherently manageable right out of the box and over the network
Dual-State Power Button	Power button acts as both an on/off button and suspend-to-sleep button

Serviceability Features of System		
Dual Color Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)		
Diagnostic LED Explanation Table	Number of 1-second red LED blinks followed by 2-second pause, then repeats: 2-processor thermal protection activated 3-processor not installed 4-power supply failure 5-memory error 6-video error 7-PCA failure (ROM detected failure prior to video) 8-invalid ROM, bootblock recover mode	
• System/Emergency ROM	• Flash ROM	• CMOS Battery Holder for easy Replacement
• Flash Recovery with Video Configuration Record SW	• 5 Aux Power LED on System PCA	• Processor ZIF Socket for easy Upgrade
• Over-Temp Warning on Screen (Requires IM Agents)	• Clear Password Jumper	• DIMM Connectors for easy Upgrade
• HP Backup and Recovery Manager	• Clear CMOS Button	• NIC LEDs (integrated) (Green & Amber)

Serviceability Features of Chassis		
• Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions	• Color coordinated cables and connectors	• Tool-less Hood Removal
• Front power switch	• System memory can be upgraded without removing the system board or any internal components	• Tool-less Hard Drive, CD & Diskette Removal
• Green Pull Tabs, and Quick Release Latches for easy Identification		

NOTE: [Thumb screw release mechanism is used with the Ultra-slim Desktop chassis cover.](#)

Additional Features	Description
Intel Standard Manageability NOTE: Requires the utilization of the integrated network connection.	Select models feature Intel's Standard Manageability technology including the following: DASH 1.0 DASH compliance for support of industry standards. Support for profile updates. Host VPN*



Technical Specifications

	Support for local management VPN tunneling
Intel Core 2 Processor with vPro Technology NOTE: Requires the utilization of the integrated network connection.	Select models feature Intel's Core 2 Processor with vPro Technology including the following: Intel Advanced Management Technology (AMT) 5.0 <ul style="list-style-type: none"> • All Intel Standard Manageability technologies • Fast call for help – client outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection • Audit Logs – policy based log of AMT actions to deter rogue administrator actions • Microsoft NAP Support – allows AMT to gain access to a Microsoft NAP enabled 802.1x network OOB to enable OOB SW updates, inventories, remote diagnostics, etc.
DASH 1.0 support (Desktop and Mobile Architecture for System Hardware)	A standards initiative for representing out-of-band management capability for computer systems. It is a secure, web-services based successor to ASF.
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments
TXT (Trusted Execution Technology) and VT-d (Virtualized devices)	<ul style="list-style-type: none"> • TXT allows for secure management (via TPM) and measured launch of VMM, as well as teardown of secrets in unexpected reset case. TXT support provided in select Intel processors. • VT-d is a chipset technology that virtualizes directed I/O <p>Together, TXT and VT-d may be used to support verified launch of a known trusted VMM that also may protect VMs from accessing each other's memory.</p>
Computrace	Computrace agent support standard
Tower	Product can be oriented as a tower (in addition to desktop orientation)
Drive Lock	Implementation of the industry standard ATA Security feature set. When enabled, it prevents software access to user data on the drive until one or two user-defined passwords are provided.
Drive Self Tests (DPS)*	<ul style="list-style-type: none"> • Drive Protection System • A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. • Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced. • The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.
DPS Access through F10 Setup during Boot	
SMART Technology* (Self-Monitoring, Analysis and Reporting Technology)	<p>Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted</p> <ul style="list-style-type: none"> • Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count • By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure • IOEDC: I/O Error Detection Circuitry • Detects errors in Read/Write buffers on HDD cache RAM • Interface in F10 setup for all dc7900 platforms provides confirmation of SMART IV support.
SMART I – Drive Failure Prediction	
SMART II – Off-Line Data Collection	
SMART III – Off-Line Read Scanning with Defect Reallocation	
SMART IV – End-to-End CRC for hard drives	

Technical Specifications

* This feature is inoperable when a RAID (Redundant Array of Independent Disks) configuration is enabled.

Technical Specifications - Audio

High Definition Audio	Type	Integrated
	High Definition Stereo Codec	Yes – ADI 4-channel ADI 1884 codec
	Audio Jacks	Front microphone-In (150-K ohm Input Impedance) Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out * (190 ohms Output Impedance, expects at least a 10-K ohm load) Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load)
	* Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally. Rear Line in audio port is re-taskable as Line-in or Microphone-in.	
	Multistreaming Capable	Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks.
	Sampling	8 kHz – 192 kHz
	Wavetable Syntheses (software)	Yes – Uses OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
Internal Speaker	Yes	
External Speaker Jack (Line-Out)	Yes	

HP Thin USB Powered Speakers	On/Off/Volume Controls	Right side of right speaker
	Power LED	Front of right speaker (green)
	Frequency response	FO to 20kHz
	Watts	2/3 watt (normal/maximum)
	Dimensions (H x W x D)	Speakers: 5.72 x 3.74 x 0.96 in (14.52 x 9.50 x 2.45 cm) per speaker
	Net weight	0.68 lbs (0.31kg)
	Environmental (all conditions non-condensing)	Temperature (operating) 14° to 104° F (-10° to 40° C) Relative Humidity (operating) 40% to 90%
	Speaker cable length	Input cord: 5.91 ft (1800mm±35mm) L-channel cord: 3.28 ft (1000mm±35mm) USB cord: 5.91 ft (1800mm±35mm)
	Color	HP Carbonite

Technical Specifications - Communications

Integrated Intel 82567LM Gigabit Network Connection	Connector	RJ-45
	Controller	Intel 82567LM Gigabit platform LAN Connect Networking Controller
	Memory	Integrated 96KbB on chip buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3 ab and 802.3u compliant
	Bus architecture	GLCI, LCI interface. Intel specific MAC to PHY interface
	Data transfer mode	At gigabit GLCI (802.3 serdes) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	Require 3.3Vaux, 1.8V and 1.0V or just 3.3V with integrated regulators Power consumption 1.16 Watts for 82566, whole LOM 2.53 Watts
	ACBS	Intel Auto Connect Battery Saving feature
	Boot ROM support	Yes
	Network transfer mode	Full-duplex
		Half-duplex (not available for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps
10BASE-T (full-duplex) 20 Mbps		
100BASE-TX (half-duplex) 100 Mbps		
100BASE-TX (full-duplex) 200 Mbps		
1000BASE-T (full-duplex) 2000 Mbps		
Environmental	Operating temperature	32° to 131°F (0° to 55° C) To 70° C for external regulator
	Operating humidity	85% at 131° F (55° C)
Management capabilities	WOL, auto MDI crossover, PXE, Multi-port teaming, RSS, Advanced cable diagnostic.	
Alerting	ASF 2.0 support, AMT 3.0 support	

Technical Specifications - Communications

Intel Pro 1000 PT PCIe Gigabit NIC	Connector	RJ-45	
	Controller	Intel 82572EI Gigabit Ethernet Controller	
	Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers	
	Data rates supported	10/100/1000 Mbps	
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	Bus architecture	PCI-E 1.0a	
	Data path width	X1, 250 MB/s, Bi-directional interface	
	Data transfer mode	Bus-master DMA	
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
	Power requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T	
	Boot ROM support	Yes	
	Network transfer rate	10BASE-T (half-duplex)	10 Mbps
		10BASE-T (full-duplex)	20 Mbps
		100BASE-TX (half-duplex)	100 Mbps
		100BASE-TX (full-duplex)	200 Mbps
		1000BASE-T (full-duplex)	2000 Mbps (actual rate limited by PCI Bus)
	Environmental	Operating temperature	32° to 131°F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Dimensions	6.4 x 2.6 x 0.8 in (16.3 x 6.6 x 1.9 cm)	
	Management capabilities	WOL, PXE, DMI, WFM 2.0	

HP 802.11b/g/n Wireless PCIe x1 Card	Dimensions (L x H)	3.3 x 4.7 inches (8.5 x 12 cm)		
	Weight	0.08 pounds (40 g)		
	Controller	Ralink RT2790		
	System interface	PCIExpress x1		
	Network standard	802.11 b/g/n		
	Frequency band	2.400 - 2.497 GHz		
	Operating temperature	14° to 149°F, operating (-10° to 65°C, operating)		
	Storage temperature	-40° to 176°F, non-operating (-40° to 80°C, non-operating)		
	Humidity	10-90% operating		
		5-95% non-operating		
	Operating voltage	3.3V +/- 9%		
		12V +/- 8%		
	Power consumption	Platform/WLAN Mode	Power Consumption	
		Maximum Power Consumption	10 Watts	
		Transmit Only	4 Watts maximum averaged power over 1 second	
Transmit Packet or Active Scanning		1000 mA peak current for 100 microseconds or longer		

Technical Specifications - Communications

	Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second	
	Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second	
	Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second	
	Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second	
Output power (approximately)	802.11b modes	802.11g modes	EWC modes
	+19 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum (total power in all transmit chains)
Receive sensitivity	Mode	Data rate	Sensitivity
	802.11b	1 Mbps	-94 dBm
	802.11b	11 Mbps	-85 dBm
	802.11g	6 Mbps	-91 dBm
	802.11g	18 Mbps	-85 dBm
	802.11g	48 Mbps	-75 dBm
	802.11g	54 Mbps	-72 dBm
	EWC (2.4 GHz)	6.5 Mbps	-87 dBm
	EWC (2.4 GHz)	54 Mbps	-82 dBm
	EWC (2.4 GHz)	81 Mbps	-78 dBm
	EWC (2.4 GHz)	162 Mbps	-74 dBm
	EWC (2.4 GHz)	270 Mbps	-68 dBm
	EWC (2.4 GHz)	300 Mbps	-64 dBm
Data transfer rate	Data Rate (MCS)	Minimum Throughput	
	1 Mbps (802.11 b)	700 kbps	
	2 Mbps (802.11 b)	1.4 Mbps	
	5.5 Mbps (802.11 b)	3.5 Mbps	
	11 Mbps (802.11 b)	5.9 Mbps	
	12 Mbps (802.11 g)	6 Mbps	
	18 Mbps (802.11 g)	9 Mbps	
	24 Mbps (802.11 g)	12 Mbps	
	36 Mbps (802.11 g)	18 Mbps	
	48 Mbps (802.11 g)	21 Mbps	
	54 Mbps (802.11 g)	22.5 Mbps	
	6.5 Mbps (20 MHz EWC)	4.5 Mbps	
	13 Mbps (20 MHz EWC)	9 Mbps	
	19.5 Mbps (20 MHz EWC)	13.5 Mbps	
	26 Mbps (20 MHz EWC)	18 Mbps	

Technical Specifications - Communications

39 Mbps (20 MHz EWC)	27 Mbps
52 Mbps (20 MHz EWC)	36 Mbps
58.5 Mbps (20 MHz EWC)	40 Mbps
65 Mbps (20 MHz EWC)	45 Mbps
78 Mbps (20 MHz EWC)	54 Mbps
104 Mbps (20 MHz EWC)	72 Mbps
117 Mbps (20 MHz EWC)	81 Mbps
130 Mbps (20 MHz EWC)	91 Mbps
13.5 Mbps (40 MHz EWC)	8 Mbps
27 Mbps (40 MHz EWC)	16 Mbps
40.5 Mbps (40 MHz EWC)	24 Mbps
54 Mbps (40 MHz EWC)	32 Mbps
81 Mbps (40 MHz EWC)	48 Mbps
108 Mbps (40 MHz EWC)	64 Mbps
121.5 Mbps (40 MHz EWC)	72 Mbps
135 Mbps (40 MHz EWC)	81 Mbps

Security

- IEEE and WiFi compliant 64 / 128 bit WEP encryption
- AES: CCM
- 802.1x authentication
- WPA: 802.1x, WPA-PSK and TKIP
- WPA2 certification
- IEEE 802.11i
- Cisco Certified Extensions, all versions through V5

Antenna

HP part number 497792-001

Certifications

Wi-Fi certified

Certifications for use by country

United States, Canada, Peru, Taiwan

Intel WiFi Link 5100
a/b/g/n (USDT) Wireless
NIC

Wireless LAN Standards

IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n (draft 2.0)*

* The specifications for 802.11n draft 2.0 are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11n WLAN devices. In countries where n draft 2.0 is not allowed, this capability is not enabled.

Interoperability

Wi-Fi certified (802.11abg only)
Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows Vista and XP
Tested with wireless access points from several major manufacturers

Technical Specifications - Communications

Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 90% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility⁵	Microsoft Windows XP	Choice of Configuration Utility:
		<ul style="list-style-type: none"> • Microsoft Windows XP Wireless Network Connection Manager • Intel PROSet for Microsoft Windows XP (required for Cisco Compatible Extensions support)
	Microsoft Windows Vista	<ul style="list-style-type: none"> • Microsoft Windows Vista Wireless Network Connection Manager. • Intel IHV extensions for Windows Vista available to support Cisco Compatible Extensions.

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. In Power Save Polling mode and on battery power.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Agere 2006 PCI 56K International SoftModem	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless
		NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set
	Operating Temperature	Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal 32° to 158° F (0° to 70° C)

Technical Specifications - Communications

Operating Humidity	20% to 90%, non-condensing
Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3 rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3 rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Health	Bare PCB material compliant to 94V-0 or better (marked as such)
Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

LSI PCIe x1 56K International SoftModem

Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/ 16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
Power Management	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.
Upgradeability	Driver upgradeable for future enhancements
Video	ITU-T V.80 video ready interface
Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal

Technical Specifications - Communications

Operating Temperature	32° to 158° F (0° to 70° C)
Operating Humidity	20% to 90%, non-condensing
Power	Requires a 3.3-V auxiliary power rail on PCI express bus Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	LSI SV92EX – Integrated PCI interface with 3.3-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI express low profile specifications—6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3 rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)
EMC	FCC Part 15, IC ES003, EN 55022, 3 rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Other	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

Technical Specifications - Hard Drives

2.5" 7200 RPM Serial ATA Hard Drives	250 GB	Capacity	250,059,350,016 bytes		
		Height (Nominal)	0.374 in (9.5 mm)		
		Width (Nominal)	Media diameter: 2.5 in (63.5 mm) Physical size: 2.75 in (70 mm)		
			Interface	Serial ATA (3.0 Gb/s)	
			Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
			Cache	8 MB	
			Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
				Average	12 ms
				Full-Stroke	22 ms
			Rotational Speed	7,200 rpm	
			Logical Blocks	488,397,168	
			Operating Temperature	41° to 131° F (5° to 55° C)	
		160 GB	Capacity	160,041,885,696 bytes	
	Height (Nominal)		0.374 in (9.5 mm)		
	Width (Nominal)		Media diameter: 2.5 in (63.5 mm) Physical size: 2.75 in (70 mm)		
			Interface	Serial ATA (3.0 Gb/s)	
			Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
			Cache	8 MB	
			Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
				Average	12 ms
				Full-Stroke	22 ms
			Rotational Speed	7,200 rpm	
			Logical Blocks	312,581,808	
			Operating Temperature	41° to 131° F (5° to 55° C)	
	80 GB		Capacity	80,026,361,856 bytes	
		Height (Nominal)	0.374 in (9.5 mm)		
		Width (Nominal)	Media diameter: 2.5 in (63.5 mm) Physical size: 2.75 in (70 mm)		
			Interface	Serial ATA (3.0 Gb/s)	
			Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
			Cache	8 MB	

Technical Specifications - Hard Drives

Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
	Average	12 ms
	Full-Stroke	22 ms
Rotational Speed	7,200 rpm	
Logical Blocks	156,301,488	
Operating Temperature	41° to 131° F (5° to 55° C)	

3.5" 7200 RPM Serial ATA Hard Drives

500 GB	Capacity	500,107,862,016 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
	Buffer	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 RPM	
	Logical Blocks	976,773,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
250 GB	Capacity	250,059,350,016 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
		Average	8.5 ms
		Full-Stroke	18 ms
	Rotational Speed	7,200 RPM	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
160 GB	Capacity	160,041,885,696 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	

Technical Specifications - Hard Drives

Interface	Serial ATA (3.0 Gb/s)	
Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
Buffer	8 MB	
Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.9 ms
	Average	9.3 ms
	Full-Stroke	18 ms
Rotational Speed	7,200 RPM	
Logical Blocks	312,581,808	
Operating Temperature	41° to 131° F (5° to 55° C)	

80 GB

Capacity	80,026,361,856 bytes	
Height	1 in (2.54 cm)	
Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
Interface	Serial ATA (3.0 Gb/s)	
Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
Buffer	8 MB	
Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
	Average	9.3 ms
	Full-Stroke	21 ms
Rotational Speed	7,200 RPM	
Logical Blocks	156,301,488	
Operating Temperature	41° to 131° F (5° to 55° C)	

10,000 RPM Serial ATA Hard Drives 160 GB

Capacity	160,041,885,696 bytes	
Height	1 in (2.54 cm)	
Width	Media diameter: 3.0 in (7.62 cm) Physical size: 4 in (10.2 cm)	
Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
Synchronous Transfer Rate (Maximum)	Up to 3.0 Gb/s	
Cache	16 Mbytes	
Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.3 ms
	Average	4.6 ms
	Full-Stroke	10.2 ms
Rotational Speed	10,000 RPM	
Logical Blocks	312,581,808	
Operating Temperature	41° to 131° F (5° to 55° C)	

Technical Specifications - Hard Drives

80 GB	Capacity	80,026,361,856 bytes
	Height	1 in (2.54 cm)
	Width	Media diameter: 3.0 in (7.62 cm) Physical size: 4 in (10.2 cm)
	Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled
	Synchronous Transfer Rate (Maximum)	Up to 3.0 Gb/s
	Cache	16 Mbytes
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track 0.3 ms Average 4.6 ms Full-Stroke 10.2 ms
	Rotational Speed	10,000 RPM
	Logical Blocks	156,301,488
	Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Graphics

Integrated Intel
Graphics Media
Accelerator 4500

3D/2D Controller
VGA Controller
DisplayPort
Bus Type
RAMDAC
Memory

Microsoft DirectX® 10 based with support for Pixel Shader 3.0

Integrated

Integrated, Multimode capable; supports HDCP

PCI Express™ x16

Integrated, 350 MHz

Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed, BIOS settings, operating system, and system load. 32 MB is pre-allocated for graphics use at system boot time. Additional memory can be allocated at boot time by the BIOS for PAVP (Protected Audio Video Playback) support for playback of protected video content. For Vista, use of PAVP heavy mode preallocates an additional 96MB.

Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use.

Windows XP Memory Usage:

Total System Memory	Pre-Allocated (MB)	DVMT (MB)
.5GB	32	128
1.0GB	32	512
1.5GB	32	768
2 GB & more	32	1024

Windows Vista Memory Usage:

(Assumes Management Engine , VT-d enabled and other memory allocated for other BIOS usage)

System Memory	PVAP	Avail System Memory (MB)	Total Avail GFX Memory (MB)	Dedicated Video Memory (MB)	System Video Memory (MB)	Shared System Memory (MB)
1 GB	Lite	952	252	32	96	124
	Heavy	856	294	122	6	166
2 GB	Lite	1976	764	32	96	636
	Heavy	1880	806	122	6	678
4 GB	Lite	4024	1759	32	96	1631
	Heavy	3928	1759	122	6	1631
6 GB	Lite	6072	1759	32	96	1631
	Heavy	5976	1759	122	6	1631
8 GB	Lite	8120	1759	32	96	1631
	Heavy	8024	1759	122	6	1631

Total Available GFX Memory: Total graphics memory available to the system as reported by the OS.

Dedicated Video Memory: Memory owned and locked for graphics use as reported by the OS. (Preallocated)

System Video Memory: System memory locked and dedicated for graphics use.

Technical Specifications - Graphics

HW Video Decode	Shared System Memory: Memory dynamically allocated for Graphics use Hardware Accelerated decode for MPEG2 encrypted video; support for PAVP Lite (default) and Heavy (or Paranoid) modes
Maximum Color Depth	32 bits/pixel
Maximum Vertical Refresh Rate	85 Hz at up to 1920x1440, 75 Hz at 2048x1536. Varies with mode and configuration. See table below.
Multi-display Support	Dual monitor support facilitated via one VGA port and one DisplayPort integrated on the back plane of the system board and presented as part of the rear I/O set of interfaces. DVI supported via optional HP DisplayPort to DVI-D adapter.
Graphics/Video API Support	Microsoft DirectX® 10, OpenGL® 1.5 (OpenGL® 2.0 available in a driver update)

Resolutions Supported

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a DisplayPort connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	1900 x 1200 digital, 2048 x 1536 analog

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

Technical Specifications - Graphics

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

Board display options	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output	
Board configuration	Specification	Description
	Graphics Chip	RV610
	Core clock	650 MHz
	Memory clock	500 MHz
	Frame buffer	256 MB DDR2, 128 bit wide
Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish	
Core power	21 W	
Compliance standards	EMC Emissions:	
	<ul style="list-style-type: none"> a. FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use b. CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c. Canadian Standard ICES-003 is equivalent to CISPR22 d. Taiwanese Standard BSMI e. Japanese VCCI f. Australian C-Tick g. Korean (MIC) 	

EMC Immunity:
 CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.

Technical Specifications - Graphics

ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2560x1600 digital, 2048 x 1536 analog

ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

Board display options	Supports two displays via the DisplayPort and DVI connectors	
Board configuration	Specification	Description
	Graphics Chip	RV620
	Core clock	750 MHz
	Memory clock	500 MHz
	Frame buffer	256 MB DDR2, 64 bit wide
Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish	
Operating systems support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32*.	

* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: <http://www.windowsvista.com/upgradeadvisor>. For Windows Vista system requirements, visit: <http://www.windowsvista.com/systemrequirements>.

Linux x86 and x86 64 distributions using XFree86 or X.Org**.

Technical Specifications - Graphics

** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: <http://www.hp.com/wwsolutions/linux/products/clients/> for support information.

Core power	22 W (max)
Dimensions (H x D)	2.71 in x 6.60 in (68.90 mm x 167.65 mm)
Weight	0.30 lb (134.3 g)
Option kit contents	<ul style="list-style-type: none"> • ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card with full height bracket attached • DVI to VGA adapter • Software CD with graphics drivers • Low profile bracket to convert the card for using in a low profile chassis • Warranty documentation
Compliance standards	<p>EMC Emissions:</p> <ol style="list-style-type: none"> FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment Canadian Standard ICES-003 is equivalent to CISPR22 Taiwanese Standard BSMI Japanese VCCI Australian C-Tick Korean (MIC) <p>EMC Immunity: CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement.</p>

ATI Radeon HD 3650 (512MB DH) PCIe x16 Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2560 x 1600 digital, 1920 x 1440 analog Supports two displays via included two DisplayPort and one Dual Link DVI connectors.
Board configuration	Specification	Description
	Graphics Chip	RV635
	Core clock	600 MHz
	Memory clock	500 MHz
	Frame buffer	512 MB DDR2, 128 bit wide
Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish	
Core power	56 W	
Compliance standards	EMC Emissions:	

Technical Specifications - Graphics

- a. FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use
- b. CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment
- c. Canadian Standard ICES-003 is equivalent to CISPR22
- d. Taiwanese Standard BSMI
- e. Japanese VCCI
- f. Australian C-Tick
- g. Korean (MIC)

EMC Immunity:
 CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.

ATI Radeon HD 3650 (512MB DH) PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

Technical Specifications - Graphics

NVIDIA Quadro NVS 290	Form Factor	Low Profile
256MB PCIe Dual Head	Bus Type	PCIe x16
	Memory	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connector	DMS-59; includes one DMS-59 to Dual VGA cable. A DMS-59 to Dual DVI-I cable is available as an option.
	Display resolution support	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows
	RAMDAC	Integrated dual 400MHz
	Color planes	32-bit color buffer
	Overlay planes	Hardware supported
	nView architecture	Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows.
	Multi-Monitor support	Dual monitor support
	DVI support	DMS-59 (to dual DVI-SL)
	High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	Supported graphics APIs	OGL 2.1 & DX10 Support; Shader Model 4.0

Technical Specifications - Input/Output Devices

USB Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC \pm 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	USB Type A plug connector
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		Microsoft® PC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
	Environmental	Acoustics	43-dBA maximum sound pressure level
		Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals		UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC
	Ergonomic compliance		ANSI HFS 100, ISO 9241-4, and TUVGS
	Kit contents		Keyboard, installation guide, warranty card, safety and comfort guide

Technical Specifications - Input/Output Devices

PS/2 Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC \pm 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	PS/2 6-pin mini din connector
		ESD	CE level 4, 15-kV air discharge
		EMI - RFI	Conforms to FCC rules for a Class B computing device
	Mechanical	Microsoft PC 99 - 2001	Functionally compliant
		Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 - 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

HP USB Smartcard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Form factor	USB basic Smart Card keyboard
		Colors	Carbonite/Silver
		Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC \pm 5%

Technical Specifications - Input/Output Devices

	Power consumption	100-mA maximum (with four LEDs ON)	
	System interface	USB Type A plug connector	
	ESD	CE level 4, 15-kV air discharge	
	EMI - RFI	Conforms to FCC rules for a Class B computing device	
Mechanical	Microsoft PC 99 - 2001	Functionally compliant	
	Languages	30+ available	
	Keycaps	Low-profile design	
	Switch actuation	55 g nominal peak force with tactile feedback	
	Switch life	20 million keystrokes (using Hasco modified tester)	
	Switch type	Contamination-resistant membrane	
	Key-leveling mechanisms	For all double-wide and greater-length keys	
Environmental	Cable length	6 ft (1.8 m)	
	Microsoft PC 99 - 2001	Mechanically compliant	
	Acoustics	43-dBA maximum sound pressure level	
	Operating temperature	50° to 122° F (10° to 50° C)	
	Non-operating temperature	-22° to 140° F (-30° to 60° C)	
	Operating humidity	10% to 90% (non-condensing at ambient)	
	Non-operating humidity	20% to 80% (non-condensing at ambient)	
	Operating shock	40 g, six surfaces	
	Non-operating shock	80 g, six surfaces	
	Operating vibration	2-g peak acceleration	
	Non-operating vibration	4-g peak acceleration	
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence	
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence	
SMARTCARD function	Support	All ISO 7816 smart cards	
	Interface	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)	
	Chipset	SCM STCII	
	Standard APIs supported	PC/SC, EMV2000, SET	
	Power	USB Port	Short circuit detection (protects smart card and reader)
			Power supply compliant with ISO7816 and EMV (5V, 60 mA)
			Supports 3-V and 5-V cards
	Power consumption	250-mA maximum draw (50 mA for the keyboard with three LEDs ON and 200-mA maximum startup current using a high-current, 60-mA smart card)	

Technical Specifications - Input/Output Devices

Communication	From card	Programmable from 9,600 baud to 115,200 baud
	From computer	Up to 38,400 baud
Landing mechanism	Contact device	Friction contact
	Card insertions rating	Up to 100,000 insertion cycles
Interface modes	USB communications through USB port SCM protocol Automatic card insertion/removal detection	
Reader performance interface	USB connection	
Electro-magnetic standards	Europe	89/336/CEE guideline
	USA	USAFCC part 15

HP PS/2 Optical Scroll Mouse	Dimensions (H x L x W)	3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in)		
	Weight	4.44 oz (126 g)		
	Environmental	Operating temperature	-32° to 104°F (0° to 40° C)	
		Non-operating temperature	-4° to 140°F (-20° to 60° C)	
		Operating humidity	10% to 90% (non condensing at ambient)	
		Non-operating humidity	10% to 90% non condensing	
		Operating shock	40 g, 6 surfaces	
		Non-operating shock	80 g, 6 surfaces	
		Operating vibration	2 g peak acceleration	
		Non-operating vibration	4 g peak acceleration	
		Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face	
		Electrical	Operating voltage	5 VDC ± 10%
	Power consumption		100mA	
	System consumption		PS/2 mini-din connector	
	ESD		CE level 4, 15 kV air discharge	
	EMI-RFI		Conforms to FCC rules for a Class B computing device	
	Mechanical	Microsoft PC99 - 2001	Functionally compliant	
		Resolution	400 ± 20% DPI	
		Tracking speed	10 in/s (25.4 cm/s) maximum	
		Acceleration	100 in/s/s (2.54 m/s/s)	
Switch actuation		61 g nominal peak force		
Switch life		3,000,000 operations (using Hasco modified tester)		
Switch type		Low force micro-switches		

Technical Specifications - Input/Output Devices

	Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
	Cable length	6 ft (1.8 m)
	Microsoft PC99 - 2001	Mechanically compliant
Scroll wheel	Width	8 mm
	Diameter	1.01 in (25.6 mm)
	Maximum rotation speed	48 rats/sec
	Switch type	Light force micro-switch
	Switch life	1 million operations
	Mechanical life	Minimum 200,000 revolutions
Regulatory approvals	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

HP USB Optical Scroll Mouse	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)
	System requirements	Microsoft Windows 95, 98, 2000, Me, XP and Vista Available USB port

Technical Specifications - Optical Storage

HP SATA SuperMulti LightScribe DVD Writer Drive	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	8.5 GB DL or 4.7 GB standard		
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	Weight (max)	2.6 lb (1.2 kg)		
	Write speeds	DVD-RAM	Up to 12X	
		DVD+R	Up to 16X	
		DVD+RW	Up to 8X	
		DVD+R DL	Up to 8X	
		DVD-R DL	Up to 8X	
		DVD-R	Up to 16X	
		DVD-RW	Up to 6X	
		CD-R	Up to 48X	
		CD-RW	Up to 32X	
		Read speeds	DVD-RAM	Up to 12X
			DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
			DVD-ROM DL	Up to 8X
			DVD-ROM, DVD+R, DVD-R	Up to 16X
			CD-ROM, CD-R	Up to 48X
	CD-RW		Up to 32X	
Access time (typical reads, including settling)	Random		DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)		
Power	Source	SATA DC power receptacle		
	DC Power Requirement	5 VDC \pm 5%-100 mV ripple p-p		
		12 VDC \pm 5%-200 mV ripple p-p		
Environmental conditions (operating - non-condensing)	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)		
		12 VDC (< 600 mA typical, 1400 mA maximum)		
	Temperature	41° to 122° F (5° to 50° C)		
	Relative Humidity	10% to 90%		
	Maximum Wet Bulb Temperature	86° F (30° C)		

SATA DVD-ROM Drive	Height	5.25-inch, half-height, tray-load
	Orientation	Either horizontal or vertical
	Interface type	SATA/ATAPI

Technical Specifications - Optical Storage

Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
Weight (max)	2.6 lb (1.2 kg)		
Read speeds	DVD+R/-R/+RW/ -RW/+R DL /-R DL	Up to 8X	
	DVD-ROM	Up to 16X	
	DVD-RAM	Up to 4X	
	CD-ROM, CD-R	Up to 48X	
	CD-RW	Up to 32X	
Removable Storage - Media Compatibility - DVD-ROM	Media	Read	Write
	CD-ROM	Yes	No
	CD-R	Yes	No
	CD-RW	Yes	No
	DVD-ROM	Yes	No
	DVD-ROM DL	Yes	No
	DVD-RAM	Yes	No
	DVD+R	Yes	No
	DVD+R DL	Yes	No
	DVD+RW	Yes	No
	DVD-R	Yes	No
	DVD-RW	Yes	No
	DVD-R DL	Yes	No
Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	Cache Buffer	2 MB (minimum)	
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
Power	Source	SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
	DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC - < 600 mA typical, < 1400 mA maximum	
Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 90%	
	Maximum Wet Bulb Temperature	86° F (30° C)	

SATA Slim SuperMulti

Height

12.7mm height



Technical Specifications - Optical Storage

LightScribe DVD Writer Drive	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc recording capacity	Up to 8.5 GB DL or 4.7 GB standard		
	Dimensions (W x H x D)	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)		
	Weight (max)	0.42 lb (190 g)		
	Write speeds	DVD-RAM	Up to 5X	
		DVD-R DL	Up to 4X	
		DVD+R	Up to 8X	
		DVD+RW	Up to 4X	
		DVD+R DL	Up to 4X	
		DVD-R	Up to 8X	
		DVD-RW	Up to 6X	
		CD-R	Up to 24X	
		CD-RW	Up to 16X	
		Read speeds	DVD-RAM	Up to 5X
			DVD-RW, DVD+RW	Up to 8X
			DVD-R DL, DVD+R DL	Up to 6X
			DVD+R, DVD-R	Up to 8X
			DVD-ROM DL, DVD-ROM	Up to 8X
	CD-ROM, CD-R		Up to 24X	
	CD-RW		Up to 24X	
	Access time (typical reads, including settling)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
Stop Time		< 4 seconds		
Cache Buffer		2 MB (minimum)		
Data Transfer Modes		ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s - default)		
Power		Source	Four-pin, DC power receptacle	
	DC Power Requirement	5 VDC \pm 5%-100 mV ripple p-p		
		12 VDC \pm 5%-200 mV ripple p-p		
	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)		
		12 VDC (< 600 mA typical, 1400 mA maximum)		
Audio output	Total Drive Power (standby mode)	< 2.5 Watt		
	Line-Out	0.7 VRMS		
	Signal-to-Noise Ratio	74 dB		
	Channel Separation	65 dB		

Technical Specifications - Optical Storage

Environmental conditions (operating - non-condensing)	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	86° F (30° C)

SATA CD-RW/DVD-ROM Combo Slim Drive	Height	12.7mm height slim CD-RW		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM)		
	Dimensions (W x H x D)	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)		
	Weight (max)	0.42 lb (190 g)		
	Write speeds	CD-R	Up to 24X	
		CD-RW	Up to 24X	
		DVD+R/-R/+RW/ -RW/+R DL /-R DL	Up to 4X	
	Read speeds	DVD-ROM	Up to 8X	
		CD-ROM, CD-R	Up to 24X	
		CD-RW	Up to 24X	
		Random DVD	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
		Random CD	DVD: < 250 ms (typical), CD: < 210 ms (typical)	
	Access time (typical reads, including settling)	Cache Buffer	2 MB (minimum)	
		Data Transfer Modes	ATA PIO mode 4); ATA Multi-word DMA mode 2; ATA UltraDMA mode 0; ATA UltraDMA mode 1, mode 2; ATA UltraDMA Mode 3 (default)	
	Power	Source	Four-pin, DC power receptacle	
		DC Power Requirement	5 VDC \pm 5%-100 mV ripple p-p	
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)	
		Total Drive Power (standby mode)	< 2.5 Watt	
Audio output level	0.7 Vrms (typical)			
Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)		
	Relative Humidity	5% to 85%		
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)		

Technical Specifications - Optical Storage

SATA DVD-ROM Slim Drive	Height	12.7mm	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Dimensions (W x H x D)	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)	
	Weight (max)	0.42 lb (190 g)	
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 4X
		DVD-ROM	Up to 8X
		CD-ROM, CD-R	Up to 24X
		CD-RW	Up to 24X
	Access time (typical reads, including settling)	Random DVD	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Random CD	DVD: < 250 ms (seek), CD: < 210 ms (seek)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s)
	Power	Source	Four-pin, DC power receptacle
DC Power Requirement		5 VDC \pm 5%-100 mV ripple p-p	
DC Current		5 VDC - <1000 mA typical, < 1600 mA maximum	
Total Drive Power (standby mode)		< 2.5 Watt	
Audio output	Line-Out	0.7 VRMS	
	Signal-to-Noise Ratio	74 dB	
	Channel Separation	65 dB	
Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)	
	Relative Humidity	5% to 85%	
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)	

Technical Specifications - Removable Storage

HP 22-in-1 (with 1394) Media Card Reader	USB Interface	USB 2.0 High-speed interface	
		NOTE: Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.	
	1394 Interface	Two IEEE-1394a external ports; 1 IEEE-1394a internal port (connects to the pass through cable on the media card reader)	
	Advance protocol support	<ul style="list-style-type: none"> ● Supports hardware ECC (Error Correction Code) function ● Supports hardware CRC (Cyclic Redundancy Check) function ● Supports MS 4-bit parallel transfer mode ● Supports MS-PRO 4-bit parallel transfer mode ● Supports MS PRO-HG Duo 4-bit parallel transfer mode ● Supports SD 4-bit parallel transfer mode ● Supports high-speed 50Mhz SD 4-bit card (version 2.0) ● Supports high-speed 52Mhz MMC 8-bit card (version 4.2) ● Supports CF v4.0 with PIO mode 6 and Ultra DMA mode 	
	Supported media type	<ul style="list-style-type: none"> ● CompactFlash Type I ● CompactFlash Type II ● Microdrive ● MultiMediaCard (MMC) ● Reduced Size MultiMediaCard (RS MMC) ● MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) ● Reduced Size MultiMediaCard 4.2 (MMC Mobile, including MMC Mobile HC) ● Secure Digital Card (SD) ● Secure Digital High Capacity (SDHC) ● miniSD ● miniSD High Capacity ● Micro SD (T-Flash) ● Micro SD HC ● Memory Stick ● Memory Stick Select ● Memory Stick Duo (MS Duo) ● Memory Stick PRO (MS PRO) ● Memory Stick PRO Duo (MS PRO Duo) ● Memory Stick PRO-HG Duo ● MagicGate Memory Stick (MG) ● MagicGate Memory Stick Duo ● xD-Picture Card 	
	Supported media type with card adapter	<ul style="list-style-type: none"> ● Memory Stick Micro (M2) ● MMC Micro 	
	Environmental	Operational Environmental Extremes	Test Parameters/Conditions - Power applied, unit operating on system $\pm 5\%$ nominal supply voltage. 10°C 10% R.H. \approx 24 hours 10°C 90% R.H. \approx 24 hours 20°C 90% R.H. \approx 24 hours 30°C 90% R.H. \approx 24 hours 40°C 90% R.H. \approx 24 hours 50°C 90% R.H. \approx 24 hours 50°C 10% R.H. \approx 24 hours

Technical Specifications - Removable Storage

Storage Environmental Extremes	Test Parameters/Conditions 140°F (60°C) @ 80% R.H. for 96 hours -22°F (-30°C) @ 20% R.H. for 48 hours No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min
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Approvals

USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3
FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T

Technical Specifications - Environmental Data

Eco-Label Certifications & declarations This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US ENERGY STAR ®
- IT ECO declaration
- EPEAT – Gold¹

NOTE: This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

¹ EPEAT certification is conditional upon ENERGY STAR qualification. Only dc7900e models which qualify for ENERGY STAR will be certified EPEAT – Gold

Ultra-Slim Desktop

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Ultra-slim Desktop model is based on a typically configured product

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	40.68 W	40.07 W	39.94 W
Sleep (Energy Star low power mode)	2.95 W	2.96 W	2.96 W
Off	1.67 W	1.68 W	1.68 W

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	139 BTU/hr	137 BTU/hr	137 BTU/hr
Sleep	10 BTU/hr	10 BTU/hr	10 BTU/hr
Off	6 BTU/hr	6 BTU/hr	6 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.1	23
Fixed Disk (random writes)	3.1	24
Optical Drive (sequential reads)	4.8	42

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

Technical Specifications - Environmental Data

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level¹, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 90.6% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
 - Corrugated carton – 1476 g
 - Polyethylene low density – 105 g
 - Wood(pallet) – 13,000 g
- Internal:
 - The EPE foam packaging material is made from 100% recycled content.
 - The corrugated paper packaging materials contains at least 100% recycled content.

¹ EPEAT certification is conditional upon ENERGY STAR qualification. Only dc7900e models which qualify for ENERGY STAR will be certified EPEAT – Gold.

Small Form Factor

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Small Form Factor Desktop model is based on a typically configured product

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	55.58 W	56.06 W	58.60 W
Sleep (Energy Star low power mode)	2.47 W	2.76 W	2.51 W
Off	1.23 W	1.51 W	1.26 W
Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	190 BTU/hr	192 BTU/hr	200 BTU/hr
Sleep	8 BTU/hr	9 BTU/hr	8 BTU/hr
Off	4 BTU/hr	5 BTU/hr	4 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Technical Specifications - Environmental Data

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

“Typical Configuration” with 7200 rpm HDD

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	3.7	27
Fixed Disk (random writes)	3.8	28

Configuration with optional 10,000 rpm HDD

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	3.8	27
Fixed Disk (random writes)	4.2	32

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level¹, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 93.4% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
 - Corrugated – 1736 g
 - Polyethylene low density foam – 35 g
- Internal:
 - EPE-Expanded Polyethylene – 293 g
- The EPE foam packaging material is made from 0% recycled content.

Technical Specifications - Environmental Data

- The corrugated paper packaging materials contains at least 25% recycled content.

¹ EPEAT certification is conditional upon ENERGY STAR qualification. Only dc7900e models which qualify for ENERGY STAR will be certified EPEAT – Gold.

Convertible Minitower

System Configuration The configuration used for the Energy Consumption and Declared Noise Emissions data for the Convertible Mini tower Desktop model is based on a typically configured product

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	56.815 W	56.054 W	57.984 W
Sleep (Energy Star low power mode)	2.319 W	2.626 W	2.296 W
Off	1.097 W	1.31 W	1.075 W
Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	194 BTU/hr	192 BTU/hr	198 BTU/hr
Sleep	8 BTU/hr	9 BTU/hr	7 BTU/hr
Off	4 BTU/hr	5 BTU/hr	4 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	3.7	22
Fixed Disk (random writes)	3.8	22

Configuration with optional 10,000 rpm HDD

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	3.9	21
Fixed Disk (random writes)	4.4	25

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Technical Specifications - Environmental Data

Battery size: CR2032 (coin cell)

Battery type: Lithium

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level¹, see www.epeat.net
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 96.6% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
 - Corrugated carbon – 1687.37 g
 - Polyethylene low density solid – 63.5 g
- Internal:
 - EPE-Expanded Polyethylene – 308 g
- The EPE foam packaging material is made from 0% recycled content.
- The corrugated paper packaging materials contains at least 25% recycled content.

¹ EPEAT certification is conditional upon ENERGY STAR qualification. Only dc7900e models which qualify for ENERGY STAR will be certified EPEAT – Gold.

Ultra-Slim Desktop, Small Form Factor, Convertible Minitor

RoHS Compliance

Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances will be virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries

Technical Specifications - Environmental Data

- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

Eco-label certifications

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

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