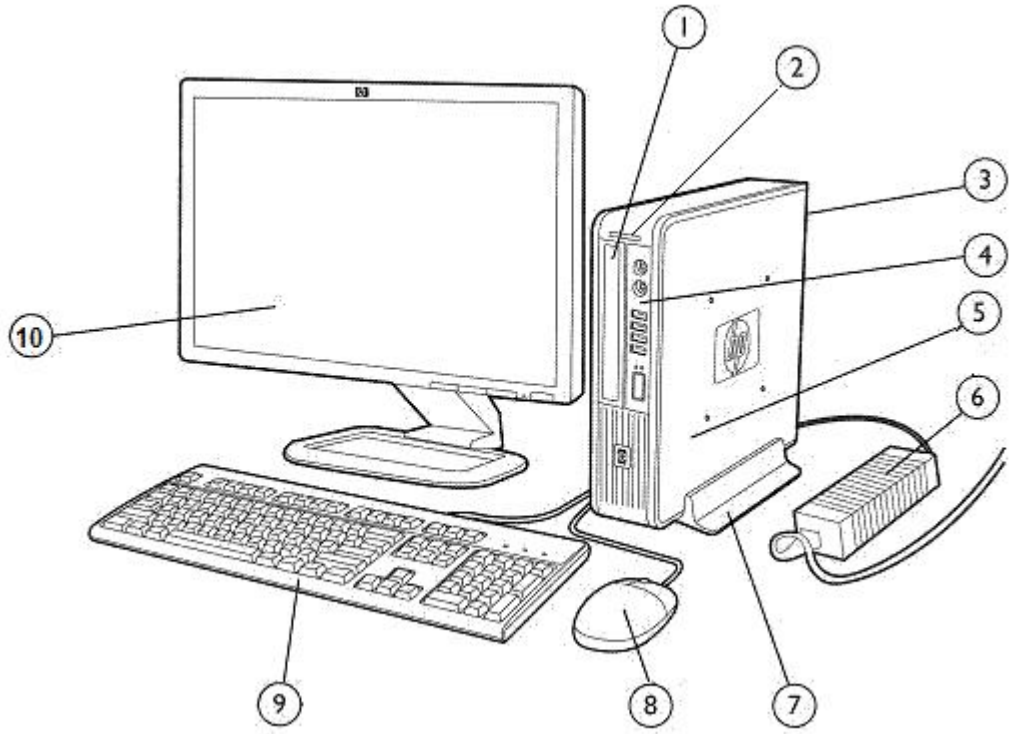
Overview

Ultra-slim Desktop



1. Optical Disc Drive

2. Optional Secure Digital (SD) Card Reader

3. Rear I/O includes (6) USB 2.0 ports, DisplayPort and VGA video interfaces, PS/2 mouse and keyboard ports, RJ-45 network interface, audio in/out jacks

4. Front I/O includes (4) USB 2.0 ports, dedicated headphone output, and a microphone/headphone jack

5. 2.5" internal hard disk drive bay

6. 135W 87% efficient external Power Adapter

7. HP USDT Tower Stand (sold separately)

8. HP Optical Mouse

9. HP Keyboard

10. HP Monitor (sold separately)

Overview

At A Glance

- Showcasing the newest environmental PC technology and features
- Free of brominated flame retardants (BFRs) and Polyvinyl Chloride (PVC) from the wall to the mouse
- All models ENERGY STAR qualified
- All models EPEAT Gold certified
- High efficiency (87%) external power adapter
- Designed for long-term deployment within medium to large commercial and institutional organizations
- Integrated dual independent monitor support via both a VGA and DisplayPort video interface
- Intel® Q45 Express chipset featuring integrated GMA 4500 integrated graphics
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- BIOS developed and engineered by HP for better security, manageability and software image stability
- Created using industry leading Design for Environment standards
- Intel Core 2 Processor with vPro Technology (on select models)
- Intel Standard Manageability (on all models)
- Protected by HP Services, including a standard 3-3-3 warranty (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability features for easier upgrades and repairs

Standard Features and Configurable Components (availability may vary by country)

Operating Systems

Preinstalled

Genuine Microsoft Windows 7 Professional Edition (32-bit)*
Genuine Microsoft Windows 7 Home Premium Edition (32-bit)*

Supported

Genuine Microsoft Windows 7 Enterprise Edition*
Genuine Microsoft Windows 7 Ultimate Edition*

* System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

+ Windows XP Professional is preinstalled on this system and includes end user rights and media for Windows 7 Professional. You may only use one version at a time. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

Value Added Software (included with all models)

- HP ProtectTools Security Suite
- HP Software Management agent
- Computrace for Desktops agent*
- HP Insight Diagnostics
- PDF Complete
- HP Power Assistant

* Computrace available as an optional aftermarket service; separate software and subscription are required

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Value Added Software (included with select models; not included when configured with FreeDOS)

- Computer Setup Utility
- Antivirus software*
- Roxio Creator Business
- HP Total Care Advisor
- Microsoft Office Trial Version
- Firefox HP Virtual Browser
- Corel WinDVD

* May be Norton or McAfee antivirus software. First 60 days included. Subscription required for live updates thereafter. Internet access required.

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

- HP Client Automation Starter
- HP SoftPaq Download Manager
- HP Client Catalog for Microsoft SMS
- HP Out-of-Band Management Console (for Intel management technology enabled models)
- HP Systems Software Manager

Value Added Services and Features

- HP Stable Platform Program
- Intel Stable Platform Program
- Business-to-Business Portals
- HP Global Series Services
- Factory Express Deployment and Lifecycle Services
- Intel Standard Manageability
- Intel Core 2 Processor with vPro Technology
- Trusted Platform Module (TPM) v1.2
  TPM module disabled where restricted by law; for example, Russia

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Service and Support

Standard Features and Configurable Components (availability may vary by country)

On-site warranty and service[1]: 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 day[2] and includes free telephone support[3] 24 x 7. Global coverage[2] ensures 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 services 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.

Chipset

Intel Q45 Express supporting Intel Graphics Media Accelerator 4500 and Intel® Core™ 2 processor with vPro™ technology

Processors

Intel Core 2 Duo Processors:

Intel Core 2 Duo E7600 Processor
3.06 GHz, 3M L2 cache, 1066 MHz FSB

Intel Core 2 Duo E8400 Processor
3.0 GHz, 6M L2 cache, 1333 MHz FSB with vPro Technology

DDR3 Synchronous DRAM NON-ECC System 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 8000f Elite Series PC supports non-ECC DDR3 PC3-10600 (1333 MHz)* and PC3-8500 (1066 MHz)* memory.

* Memory bus speed is dependent on processor.

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 board.

Supports up to 8 GB of DDR3 SDRAM 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.

NOTE: The Q45 chipset Graphics Memory Controller Hub (GMCH) supports DDR3 memory technology up to a maximum of 1066 MHz. Therefore, systems configured with PC3-10600 (1333 MHz) memory DIMMs will operate at 1066 MHz.

Standard Features and Configurable Components (availability may vary by country)

SO-DIMM Size	Slot	
	Channel A	Channel B
	1 (black)	2 (white)
1 GB	1 GB	None
2 GB (dual channel symmetric)	1 GB	1 GB
2 GB	2 GB	None
4 GB (dual channel symmetric)	2 GB	2 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 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.

Memory Configurations

2-GB DDR3 SDRAM PC3-10600 (1,333MHz) Non ECC (1 x 2GB)

4-GB DDR3 SDRAM PC3-10600 (1,333MHz) Non ECC (2 x 2GB)

Storage Drives (2.5")

250GB Hard Disk Drive
7,200 rpm, 8MB cache, 3.0 GB/s

64GB Solid State Drive

Optical Drive (slim)

SuperMulti DVD Writer Drive[1,2,3]

[1]For playing DVDs, Corel WinDVD 8
[2]For writing CDs, choice of Sonic/Roxio Easy Media Creator 9 orRoxio 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

Media Reader

Secure Digital (SDHC) Reader

Standard Features and Configurable Components (availability may vary by country)

Security

Trusted Platform Module (TPM) 1.2[1]
Stringent Security (via BIOS)[2]
SATA Port Disablement (via BIOS)
Drive Lock
HP ProtectTools Embedded Security Software
Serial, Parallel, USB enable/disable (via BIOS)
Optional USB Port Disable at factory (user configurable via BIOS)
Removable Media Write/Boot Control
Power-On Password (via BIOS)
Setup Password (via BIOS)
Hood Lock/Sensor
Support for chassis padlocks and cable lock devices

[1]TPM module disabled where use is restricted by law; for example, Russia.
[2]This setting is defaulted to disable, but when enabled, the PW jumper will not clear the BIOS pre-boot authentication passwords.

Network Interface Connection

Intel 82567LM GbE Network Connection (integrated)

Graphics

Intel Graphics Media Accelerator 4500 (integrated)

Audio/Visual

High Definition Audio with Realtek ALC261 codec (all ports are stereo)
Microphone/Headphone* and dedicated headphone front ports
Line-out and Line-In rear Ports*
Multi-streaming capable*
Internal Speaker (standard)

* The front Microphone/Headphone port is re-taskable as a Line-in, Microphone-in or Headphone . 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 Realtek 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

HP USB Standard Keyboard
HP USB Optical Scroll Mouse

Miscellaneous

Standard Features and Configurable Components (availability may vary by country)

HP USDT PC Tower Stand
HP USDT Rear Port/Cable Control Cover

After-Market Options (availability may vary by region)

Graphics	Part Number
HP DisplayPort To DVI-D adapter	FH973AA
HP DisplayPort To DL DVI-D adapter	NR078AA
HP DisplayPort to VGA Adapter	AS615AA
HP DisplayPort Cable Kit	VN567AA

Input/Output Devices	Part Number
HP USB Standard Keyboard	DT528A
HP USB Optical Scroll Mouse	DC172B

System Memory – DDR3 SDRAM	Part Number
2 GB SO-DIMM	VH640AA
4GB SO-DIMM	VH641AA

Multimedia Devices	Part Number
HP Thin USB Powered Speakers	KK912AA
DVD-ROM Drive (Slimline)	FH967AA
SuperMulti Drive (Slimline)	KV843AA

Removable Media Storage	Part Number
HP USB External Diskette Drive	DC141B

Monitors*	Part Number
HP Compaq LA22f 22-inch Widescreen LCD Monitor*	VU893AA

* This is only representative, not an exhaustive list. All HP monitors are supported that accept a graphics output provided by this PC.

Security Devices	Part Number
HP/Kensington MicroSaver Cable Lock	PC766A
HP Business PC Security Lock	PV606AA
HP (2009) USDT Rear Port Controller Cover	VN571AA
HP USB SmartCard Keyboard	ED707AA

After-Market Options (availability may vary by region)

Software Solutions	Part Number
HP Client Configuration Manager, Premium Edition	T3488AA (use T3489AA for 1000 licenses)

Stands and Accessories	Part Number
HP Integrated Work Center Stand	GN783AA
HP (2009) USDT Tower Stand	VN568AA

Technical Specifications

Dimensions	
Chassis (H x W x D)	2.6 x 9.9 x 10 in 66 x 251.5 x 254 mm
System Volume	257.5 cu in 4.22 L
Tower Stand (H x W x D)	1.07 x 4.92 x 6.69 in 27.2 x 124.9 x 169.9 mm
Packaging (H x W x D)	8.60 x 15.68 x 19.68 in 218.4 x 398.3 x 499.9 mm
System Weight*	6.75 lb 3.07 kg
Shipping Weight*	14.42 lb 6.54 kg
Max Supported Weight (desktop orientation)	77 lb 35 kg
*Configured with 1 hard drive, 1 optical drive, no diskette drive, and no PCI card.	
I/O Ports	
USB 2.0	Front – four (4) ports Rear – six (6) ports
PS/2	color coded support for keyboard (purple) and mouse (green)
Video	VGA and DisplayPort provide integrated dual independent monitor support
DVI output	available via an HP DisplayPort to DVI Adapter aftermarket option
Audio	Front – microphone & headphone Rear – line input (supports microphone or line input), line out
NIC	Industry standard RJ-45 port accesses the integrated network interface controller
Drive Controller	
Serial ATA (SATA) supporting 1.5GB/s and 3.0GB/s	
(1) SATA interface	
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.	

Technical Specifications

Unit Environment and Operating Conditions	
General Unit Operating Guidelines • 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	
Type	135W 87% efficient active PFC
Operating Voltage Range	90 – 264 VAC
Rated Voltage Range	100 – 240 VAC
Rated Line Frequency	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz
Rated Input Current	N/A
Rated Input Current with Energy Efficient* Power Supply	2.4A
Current Leakage (NFPA 99)	< 250 μA
System Heat Dissipation	Typical 133 btu/hr (33.5 kg-cal/hr) Maximum 549 btu/hr (132 kg-cal/hr)
FEMP Standby Power Compliant (<2W in S5 – Power Off)*	X
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	< 2.7W
Dimensions	6.7 x 2.6 x 1.5 in
Total Cord Length	12 ft 8 in

ROM BIOS Information

- The HP BIOS provides several technologies that help integrate the HP Compaq 8000f Elite USDT PC into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages
- Supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification
- Includes the Computrace agent for tracking and tracing services; available in select countries, separate software and purchase of a subscription is required
- The HP BIOS enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Compaq 8000f Elite Business Desktop computer in any enterprise environment.
- 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.
- Power-On password – Helps prevent an unauthorized user from powering on the system.
- 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) – allowing operating systems and applications to manage power based on activity and usage. 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.

Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 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 recovery mode
    - 9 – system not fetching code
    - 10 – system hang while loading an option ROM
- System/Emergency ROM & Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Clear Password Jumper
- DIMM Connectors for easy upgrade
- Clear CMOS Button
- NIC LEDs (integrated): green & amber
- Dual Color Power and HD LED - indicates normal operations and fault conditions
- Color coordinated cables and connectors
- Tool-less access cover, hard disk drive and optical drive removal
- Green pull tabs and quick release latches

Additional Features
• Product can be oriented in either desktop or tower mode
• 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 Protection System
  ○ Access through F10 Setup during boot
  ○ A diagnostic hard drive self test; scans critical physical components and every sector of the hard drive for physical faults; reports any faults to the user
  ○ Runs independently of the operating system, can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure; 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

Technical Specifications - Audio

High Definition Audio	Type	Integrated
	High Definition Stereo Codec	Yes - Realtek 4-channel ALC261 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) Front Microphone/Headphone jack is re-task able to provide Microphone input, line-in or Headphone output to support connecting two headphones to the front of the system. When configured as a second front headphone output, both front headphone outputs are always driven with the same signal.
	Internal Speaker Amplifier is for the internal speaker only. External speakers need to be powered externally. Rear Line-In audio port is re-task able as Line-In or Microphone-In.	
	Multistreaming Capable	Multistreaming can be enabled in the Realtek 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

Technical Specifications - Communications

Intel 82567LM Gigabit Network Connection (integrated)	Connector	RJ-45	
	Controller	Intel 82567LM Gigabit platform LAN Connect Networking Controller	
	Memory	24 KB FIFO packet 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 (Intel proprietary 802.3 series-based interface) 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	Requires 3.3V,1.9/1.8V and 1.0V or just 3.3V with integrated regulators Power consumption 1.3 Watts for 82567 whole LOM	
	ACBS	Intel Auto Connect Battery Saving feature	
	Boot ROM support	Yes	
	Network transfer mode	Full-duplex	
		Half-duplex (not supported 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, Muti-port teaming, RSS, Advanced cable diagnostic.	
	Alerting	ASF 2.0 support, AMT 3.0 support	

Integrated Intel Graphics Media Accelerator (GMA) 4500	3D/2D Controller	Microsoft DirectX® 10 based with support for Pixel Shader 3.0
	VGA Controller	Integrated
	DisplayPort	Integrated, Multimode capable; supports HDCP
	Bus Type	PCI Express™ x16
	RAMDAC	Integrated, 350 MHz
	Memory	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
2GB & 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.

	Shared System Memory: Memory dynamically allocated for Graphics use
HW Video Decode	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	Integrated dual independent 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 the may not have been tested and qualified by HP.

	Maximum Refresh Rate (Hz)	
Resolution	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.

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)	
Solid State Drive	64 GB	**Capacity**	64 GB	
		NAND Flash Memory	Multi Level Cell (MLC) with wear leveling controller	
		Interface type	SATA 3Gb/sec	
		Dimensions-external (W x H x D)	2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm)	
		Weight	0.14 lb (65 g)	
		Internal transfer rate	**Write speed**	Up to 220 MB/s
			Read speed	Up to 120 MB/s
		Host transfer rate	**Ultra DMA mode**	Up to 150 MB/s
		Power	**DC power requirement**	5 VDC 5%-100 mV ripple p-p
			Total power consumption	<1.12Watt
		Environmental (all conditions, non-condensing)	**Temperature** (operating)	32° to 158° F (0° to 70° C)
			Relative Humidity (operating)	5% to 95%
			Maximum Wet Bulb Temperature (operating)	84° F (29° C)
		Regulations	UL, CSA, EN 60950-2000, CISPR Pub 22 Class B, CNS 13438, AS/NZS CISPR 22:2002 Class B, R1113 and C1172 Class B	

NOTE: For solid state disk drives, GB means 1 billion bytes. 16GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity varies by content and will be less than 15.8GB.

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 ± 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
		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	
	Kit contents	Keyboard, installation guide, warranty card, safety and comfort guide	
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 Slim SuperMulti DVD Writer Drive	Height	12.7mm height	
	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 ± 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)
		Total Drive Power (standby mode)	< 2.5 Watt

Technical Specifications - Optical Storage

Audio output	Line-Out	0.7 VRMS
	Signal-to-Noise Ratio	74 dB
	Channel Separation	65 dB
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)

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 Gold where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.

Energy Consumption (typically configured)	115 VAC	230 VAC	100 VAC
Normal Operation	25.35 W	25.83 W	25.32 W
Sleep (Energy Star low power mode)	3.435 W	3.457 W	3.443 W
Off	1.345 W	1.385 W	1.351 W

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	87 BTU/hr	88 BTU/hr	87 BTU/hr
Sleep	12 BTU/hr	12 BTU/hr	12 BTU/hr
Off	5 BTU/hr	5 BTU/hr	5 BTU/hr

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

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

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.9	32
Fixed Disk (random writes)	3.9	32

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

Battery size: CR2032 (coin cell)
Battery type: Li-metal

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 where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.
- Plastics parts weighing over 25 grams used in the product are marked

per ISO 11469 and ISO1043.

- This product contains 0.225% post consumer recycled plastic (by wt.)
- This product is 90% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
  - Corrugated 1460.5 g
- Internal:
  - EPE - Expanded Polyethylene 177 g
  - Polyethylene low density solid 30 g
- The EPE - Expanded Polyethylene packaging material is made from 100% recycled content.
- The corrugated packaging materials contains at least 70% recycled content.
- The Polyethylene low density solid packaging material is made from 100% recycled content.

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
- 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