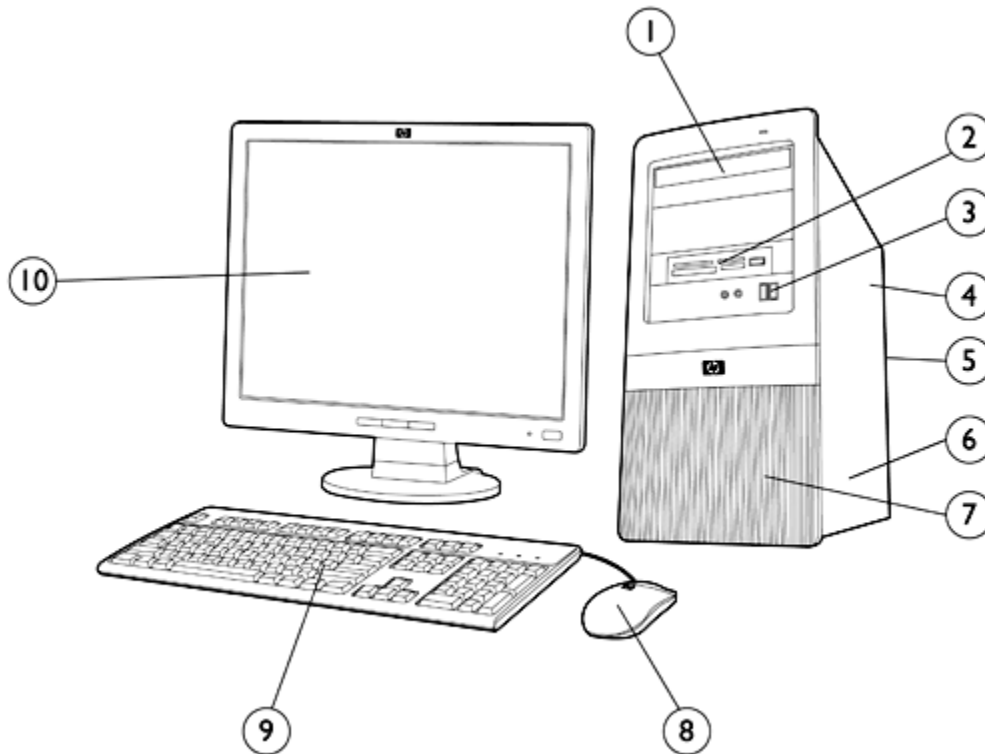


Overview

HP recommends
Windows Vista® Business

Microtower



- | | |
|--|---|
| 1. (2) external 5.25" drive bays for optional optical drives | 6. (1) full-height PCI 2.3 slot, (2) PCIe x1 slots, (1) PCIe x16 slot |
| 2. (1) external 3.5" drive bay for optional media reader or diskette drive | 7. (2) internal 3.5" drive bays |
| 3. (2) USB 2.0 ports, audio ports | 8. PS/2 Scroll Mouse |
| 4. 300-watt max power supply | 9. HP Standard Keyboard |
| 5. (4) USB 2.0 ports, (2) PS/2, (1) RJ-45, (1) VGA, (1) audio in – (1) audio out – (1) MIC | 10. Monitor (sold separately) |

Overview

At A Glance

- AMD Phenom™ Quad and Triple Core processors, AMD Athlon™ 64 X2 Dual Core processors, AMD Athlon 64 processors, and AMD Sempron™ processors
- Choice of operating systems:
 - Genuine Windows Vista Business 32
 - Genuine Windows Vista Home Basic 32
 - Genuine Windows Vista Ultimate 32 (English Only)
 - Genuine Windows Vista Business with Genuine Windows XP Professional custom pre-installed
 - FreeDOS
- NVIDIA nForce 430 Chipset
- PCI and PCI Express I/O buses
- Serial ATA controller
- USB 2.0 support
- NVIDIA Integrated MAC and Realtek 8211B Gigabit Ethernet
- Choice of hard drives and optical drives
- DDR2 SDRAM system memory
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

Standard Features and Configurable Components

Processor and Speed

One of the following

AMD Sempron Processors with HyperTransport™ Technology:

AMD Sempron LE-1200 Processor (2.1-GHz, 512K L2 cache, HT bus 1.0)

AMD Sempron LE-1250 Processor (2.2-GHz, 512K L2 cache, HT bus 1.0)

AMD Sempron LE-1300 Processor (2.3-GHz, 512K L2 cache, HT bus 1.0)

AMD Athlon Single-Core Processors with HyperTransport Technology:

AMD Athlon LE-1640B Processor (2.7-GHz, 512K L2 cache, HT bus 2.0)

AMD Athlon Dual-Core Processors with HyperTransport Technology:

AMD Athlon X2 4450B Processor (2.3-GHz, 1MB L2 cache, HT bus 2.0)

AMD Athlon X2 5000B Processor (2.6-GHz, 1MB L2 cache, HT bus 2.0)

AMD Athlon X2 5200B Processor (2.7-GHz, 1MB L2 cache, HT bus 2.0)

AMD Athlon X2 5400B Processor (2.8-GHz, 1MB L2 cache, HT bus 2.0)

AMD Phenom Triple-Core Processors with HyperTransport Technology:

AMD Phenom X3 8600B Processor (2.3-GHz, 1.5 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)

AMD Phenom Quad-Core Processors with HyperTransport Technology:

AMD Phenom Quad-Core 9550 Processor (2.2-GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, 2GT/s)

AMD Phenom X4 9600B Processor (2.3-GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)

Operating Systems and Application Software

(availability varies by region)

Genuine Windows Vista Ultimate 32 (English Only) *

Genuine Windows Vista Business 32*

Genuine Windows Vista Home Basic 32*

Genuine Windows Vista Business with Genuine Windows XP Professional custom pre-installed*†

Free DOS

* Certain Windows Vista product features require advanced or additional hardware. See:

<http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx> and:

<http://www.microsoft.com/windowsvista/getready/capable.mspx> for details. 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>.

† This Windows Vista Business licensed product will ship to you with Genuine Windows XP Professional custom installed on the hard drive. Customers buying these downgraded systems are expected to purchase at least 25 licenses annually.

Microsoft Office 2007 Basic

Microsoft Office 2007 Small Business

Microsoft Office 2007 Professional

Microsoft Works 8.5

Roxio Easy Media Creator 9.x**

Intervideo WinDVD Player 5.x**

McAfee Total Protection Service

Sun Java Runtime Environment

AOL Toolbar

** Supporting software available with certain optical drive configurations

Standard Features and Configurable Components

Hard Drives

80-GB Serial ATA 3.0-Gb/s NCQ, Smart IV (7200 rpm)
160-GB Serial ATA 3.0-Gb/s NCQ, Smart IV (7200 rpm)
250-GB Serial ATA 3.0-Gb/s NCQ, Smart IV (7200 rpm)
500-GB Serial ATA 3.0-Gb/s NCQ, Smart IV (7200 rpm)

System Memory

512-MB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (1 x 512MB)
1-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (1 x 1GB)
2-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (2 x 1GB)
2-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (1 x 2GB)
3-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (3 x 1GB)
4-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (4 x 1GB)
4-GB DDR2 Synch DRAM PC2-6400 (800-MHz) Non-ECC (2 x 2GB)

Storage –

One or more of the following (see Storage section below)

Diskette Drive

1.44-MB Diskette Drive

Media Reader

HP 16-in-1 Media Reader and additional USB 2.0 port

Optical Drives (Serial ATA)

SATA DVD-ROM Drive
SATA CD-RW/DVD-ROM Combo Drive
SATA SuperMulti LightScribe DVD Writer Drive

Input Devices**Keyboard –** One of the following

HP PS/2 Standard Keyboard
HP USB Standard Keyboard

Mouse – One of the following

PS/2 2-Button Optical Scroll Mouse
USB 2-Button Optical Scroll Mouse
USB 2-Button Laser Mouse

Audio

Realtek ALC888S High Definition audio codec
3D audio compliant and HD Audio compatible
Internal PC speaker

Communication

Integrated Realtek RTL8211B Gigabit Ethernet Controller
Intel PRO/1000 PT Gigabit PCIe Controller (full height) – optional
Agere 56K PCI Modem – optional
HP Wireless A+G PCI Card (full height) – optional

Standard Features and Configurable Components

Graphics

NVIDIA GeForce 6150SE Graphics – integrated

NVIDIA GeForce 8400 GS (256MB) Single Head PCIe x16 – optional*

ATI Radeon HD 2400XT (256MB DH) PCIe x16 – optional

ATI Radeon HD 3650 (512MB DH) PCIe x16 – optional

* 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.

Miscellaneous

HP FireWire / IEEE 1394 PCI Card (full height)

HP Serial/Parallel PCI Card (full height)

System Details

Base Unit

- Micro ATX microtower chassis, including power supply and front bezel
- Five (5) drive bays and four expansion slots
- Microsoft operating system CD – optional
- Active type heatsink
- 92 x 92 x 25 mm chassis fan
- System board NVIDIA MCP61P, Realtek RTL8211B GbE Ethernet PHY, and Realtek ALC888S audio, (1) full-height PCI 2.3 slot, (2) PCI Express x1 slots, (1) PCI Express x16 slot, (4) DDR2 DIMM memory slots, (4) Serial ATA data connectors
- Product documentation on CD
- HP system restore CD – optional
- Power cord

Slots	PCI	One (1) full-height PCI 2.3 slot on PCA Two (2) full-height PCI Express x1 slots on PCA One (1) full-height PCI Express x16 slot on PCA (for graphic cards)
	Memory Expansion	Four (4) DDR2 SDRAM DIMM slots (4 GB maximum memory support)

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.

Bays	Internal	Two (2) 3.5"
	External	Two (2) 5.25" One (1) 3.5"

USB Support	EHCI high-speed USB 2.0 controller Two (2) front ports; Four (4) rear ports, Two (2) internal ports on motherboard
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Interfaces (Legacy)	One (1) PS/2 keyboard port One (1) PS/2 mouse port One (1) analog VGA video port One (1) line in; one (1) line out; one (1) mic in One (1) RJ45 network port
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Weight & Dimensions	Chassis Dimensions (H x W x D)	15.16 x 7.28 x 16.38 in. with bezel (385 x 185 x 416 mm) 14.88 x 6.50 x 16.10 in. without bezel (378 x 165 x 409 mm)
	Packaged Dimensions (L x W x H)	19.13 x 21.875 x 10.13 in 490 x 556 x 257 mm
	System Weight	22.4 lb (10.2 kg)
	Shipping Weight	30.8 lb (14.0 kg)

System Details

Technology and Features	Memory Type	PC2-6400 DDR2 SDRAM (800MHz) non-ECC Up to 4-GB maximum system memory supported
	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.	
	Hard Drive Interfaces Supported	Serial ATA

Chassis	Front Panel	Power button Power On LED HDD Activity LED
	Cooling Solutions Supported	Power Supply Fan (variable speed) Active heatsink (variable speed) Chassis fan
	Slots Supported	Four (4) full-height expansion slots
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard Micro ATX I/O connectors, including four (4) USB 2.0 ports
	Drive Bays	Two (2) 5-1/4" external One (1) 3-1/2" external Two (2) 3-1/2" internal
	Internal Speaker	Standard
	Security	Padlock loop Kensington Lock Support
	Power Supply	300-watt ATX Power Supply – PFC/non-PFC with a 115v/230v line switch (varies by country/region)

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 4 in (10.2 cm) 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 (9000 m)

NOTE: Operating temperature is de-rated 1.0 deg C per 1000 ft (300 m) to 10,000 ft (3000 m) 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.

System Details

System Board	Processor	Socket AM2 and AM2+ Support AMD Sempron, Athlon 64, Athlon 64 X2, Phenom 3C or Phenom 4C
	PWM	ST L6740 – 3 phase
	Chipset	NVIDIA nForce 430
	Super I/O	ASUS F8000
	Front Side Bus Frequency	HT2, 1GHz x 16 up and down links
	Memory	DDR2 SDRAM 4 x DIMM slots
	Clock Generator	Integrated in chipset
	Integrated Graphics	NVIDIA GeForce 6150SE
	Audio	Realtek ALC888S HD Audio compatible codec with two channel audio 3D audio
	LOM	Integrated NVIDIA MAC and Realtek RTL8211B Gigabit Ethernet
	Storage	Four Serial ATA interfaces
	Expansion Slots	1 x PCI 2.3 slot 2 x PCI Express x1 slots 1 x PCI Express x16 slot
	BIOS	SPI EEPROM
	Industrial Standard	PCI 2.3 compliant USB 2.0
	Rear Side I/O Ports	1 x PS/2 keyboard port 1 x PS/2 mouse port 4 x USB 2.0 ports 1 x RJ-45 10/100/1000 port 1 x D-sub 15 pin analog VGA port 3 x audio ports
	On Board I/O Interfaces	1 x ATX power connector 1 x +12V power connector 1 x Floppy connector 1 x Front panel connector, Switch, LED (ON/Flash/OFF) 2 x Fan headers for CPU, chassis, with voltage/fan speed control 1 x header to support 2 USB 2.0 ports at front side 1 x header to support 2 front (Headphone/Mic) audio ports 1 x header to support USB media reader
	Board Size	Micro-ATX, PCB Size: 9.6 x 9.0 in (24.38 x 22.86 cm) 4-layer PCB with green color
	Additional Features	Bootable without keyboard, mouse or monitor Keyboard/mouse/USB wake up Support S1, S3, S4 and S5 ACPI status Hardware monitor capability CPU fan speed control

System Details

Network Interface	Integrated Realtek 8211B Gigabit Ethernet Controller	Hardware Highlights Features	PCIe x1 interface 10-Mbps, 100-Mbps and 1000-Mbps operation Crossover detection and auto-correction Wake-on-Lan and remote Wake-up
	Intel PRO/1000 PT Gigabit PCIe Adapter	Hardware Highlights Features	PCI Express interface 10-Mbps, 100-Mbps and 1000-Mbps operation

Wireless Wireless A+G PCI Card (full height bracket) – optional

- Power Supply**
- ATX Power Supply – Passive PFC/non-PFC with a 115v/230v line switch
 - Passive Power Factor Correction (PFC) – with line switch set to 230V – No PFC in 115V line switch position
 - 90 to 140VAC, or 180 to 264VAC operating voltage range
 - 100 to 127VAC, or 200 to 240VAC rated voltage range
 - 50-60 Hz rated line frequency
 - 47-63 Hz operating line frequency range
 - 300 watt maximum rated power
 - 80-mm power supply fan – variable speed for optimum acoustics

- Power Conservation 'Energy Saver'**
- APM 1.2 support
 - Screen blanking
 - Hard drive 'Idle' mode
 - System Idle mode
 - ~2 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC)
 - Processor/Cache memory power-down (S3)

- System Environmental Specs**
- Values are subject to change without notification and are for reference only.
 - Performance of system, options, and ancillary equipment will vary depending on the system configuration.
 - Levels presented do not account for non-HP/Compaq installed hardware.

Ambient Air Temperature	Operating	50° to 95°F (10° to 35°C) at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8000 ft (2500 m), no direct sustained sunlight. Maximum rate of change is 77°F/Hr (25°C/Hr). The upper limit may be limited by the type and number of options installed.
	Storage	-22° to 140°F (-30° to 60°C) – Maximum rate of change: 410°F/Hr (210°C/Hr).
Humidity	Operating	10% to 90% relative humidity (Rh), 86°F (30°C) maximum wet bulb temperature, non-condensing
	Storage	10% to 95% relative humidity (Rh), 101.66°F (38.7°C) maximum wet bulb temperature, non-condensing
Altitude	Operating	0 to 10,000 feet (0 to 3048 meters) – This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8

System Details

		m/min).
	Non-Operating	0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min).
Shock		Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during a 2 to 3 ms half-sine shock pulse, 11 ms trapezoidal shock pulse.
	Non-Operating	35G's (Half-sine Shock) 35G's (Trapezoidal Shock)
Vibration		Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range.
	Operating	Random vibration at 5Hz@0.00025G ² /Hz, 10Hz@0.01G ² /Hz, 100Hz@0.01G ² /Hz, 300Hz@0.00001G ² /Hz 5Hz to 300Hz, (0.25G's nominal).
	Non-Operating	Random vibration at 0.008G ² /Hz, 10Hz to 500Hz, (2 Grms nominal).
Acoustic Noise		Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 73.4°F (23°C) ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).
	IDLE (Fixed disk drive spinning)	LWAd = 4.3 Bels, Desktop Average LpAm = 32 dBA
	FIXED DISK (Random write)	LWAd = 4.8 Bels, Desktop Average LpAm = 37dBA
	CD-ROM (Sequential Reads)	LWAd = 5.0 Bels, Deskside Average LpAm = 39dBA

Service and Support

On-site Warranty¹: One-year (1-1-1) limited warranty delivers one year of on-site, next business-day² service for parts and labor 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. One-year onsite and labor are not available in all countries.

¹Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region

²On-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.

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

After-Market Options

Communication	NICs		
		Intel PRO/1000 PT Gigabit PCIe Controller (full height)	EH352AA
	Wireless LAN		
		HP Wireless A+G PCI Card (North America only)	EA118AA
		HP Wireless A+G PCI Card (WW except North America)	PZ928AA
	Modems		
		Agere 2006 PCI High-Speed 56K International SoftModem	EK694AA
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Hard Disk Drives		HP 500-GB SATA 3.0-Gb/s Hard Drive	PV943A
		HP 250-GB SATA 3.0-Gb/s Hard Drive	PY278AA
		HP 160-GB SATA 3.0-Gb/s Hard Drive	PY277AA
		HP 80-GB SATA 3.0-Gb/s Hard Drive	PY276AA
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Removable Storage Devices	Diskette Drive		
		HP 1.44-MB Internal Diskette Drive	AH053AA
		HP 1.44-MB USB Diskette Drive – External	DC141B
		16-in-1 Media Reader	EM718AA
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Input Devices	Keyboards		
		HP PS/2 Standard Keyboard	DT527A
		HP USB Standard Keyboard	DT528A
	Mice		
		HP USB 2-Button Laser Mouse	GW405AA
		HP PS/2 2-Button Optical Scroll Mouse	EY703AA
		HP USB 2-Button Optical Scroll Mouse	DC172B
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Memory		HP 2-GB PC2-6400 (DDR2-800 MHz) DIMM	AH060AA
		HP 1-GB PC2-6400 (DDR2-800 MHz) DIMM	AH058AA
		HP 512-MB PC2-6400 (DDR2-800 MHz) DIMM	AH056AA
<hr/>			
Audio		HP Satellite Speakers	ZD929AA
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Graphics		NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card*	GJ119AA
		ATI Radeon HD 2400 XT 256MB DH PCIe x16 Graphics Card	KD060AA
		ATI Radeon HD 3650 (512MB DH) PCIe x16	KS505AA
		* 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.	
<hr/>			
Optical Drives		HP SATA DVD-ROM Drive	AH047AA
		HP SATA SuperMulti LightScribe DVD Writer Drive	GF343AA

After-Market Options

Security	HP Business PC Security Lock Kit	PV606AA
Miscellaneous Accessories	HP FireWire / IEEE 1394 PCI Card	PA997A
Monitors*	CRTs	
	HP s7540 17" (16.0" vis) CRT Monitor	PF997AA#XXX
	HP v7650 17" (16.0" vis) Flat-face CRT Monitor	PF996AA#XXX
	TFTs	
	HP L1506 15" TFT Flat Panel Monitor – Analog only	PX848AA#XXX
	HP L1706 17" TFT Flat Panel Monitor – Analog only	PX849AA#XXX
	HP L1740 17" TFT Flat Panel Display – Analog/Digital	PL766AA#XXX
	HP L1755 17" TFT Flat Panel Display – Analog/Digital	PL777AA#XXX
	HP L1906 19" TFT Flat Panel Display – Analog only	PX850AA#XXX
	HP L1940T 19" TFT Flat Panel Display – Analog/Digital	EM869AA#XXX
	HP L1955 19" TFT Flat Panel Display – Analog/Digital	PD974AA#XXX
	HP L2065 20" TFT Flat Panel Display – Analog/Digital	EF227A4#XXX
	HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital	EF224A4#XXX
	GSA Monitors	
	HP L717g 17" GSA Flat Panel Monitor	EE191AA#XXX
	HP L919g 19" GSA Flat Panel Monitor	EE192AA#XXX
	Options	
	HP Flat Panel Speaker Bar	EE418AA
	HP CRT Monitor Multimedia Base	PM552AA

*This is only representative, not an exhaustive list.

Memory

DDR SYNCH DRAM NON-ECC MEMORY

Non-ECC DDR2 memory up to PC2-6400 (800-MHz). 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.

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.

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.

STANDARD MEMORY

512-MB, 1-GB, 2-GB, or 4-GB DDR2 SYNCH DRAM

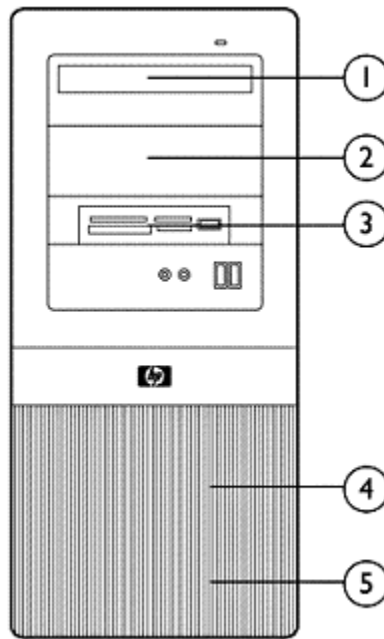
OPTIONAL MEMORY UPGRADES

Supports up to 4-GB of DDR2 SYNCH DRAM. 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.

	Channel A	Channel B	Channel A	Channel B
DIMM Size	Slot 1	Slot 2	Slot 3	Slot 4
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
4-GB (dual-channel symmetric)	2-GB	2-GB		

Storage



HP Compaq dx2450 Microtower Business PC

Drive Support	Maximum Quantity Supported	Position Supported	Controller
Diskette Drives	1	3	SIO
Media Reader	1	3	Internal USB 2.0 port
DVD-ROM Drives	2	1, 2	SATA
CD-RW/Combo Drives	2	1, 2	SATA
SuperMulti LightScribe DVD Writer Drives	2	1, 2	SATA
3.5" Serial ATA Hard Drives	2	4,5	SATA

Technical Specifications - Audio

Integrated Realtek ALC888S Audio	Type	Integrated
	HD Audio compatible codec	Yes
	Sampling	Supports 48/96 KHz
	Audio Jacks	Mic-In
		Line-In
		Line-Out / Headphone Out
	Power Support	Digital: 3.3V Analog: 5V
Other	Meets performance requirements for audio on PC99/2001 systems High-performance DACs with 97dB SNR(A-Weighting) ADCs with 90dB NR(A-Weighting)	

Technical Specifications - Communications

Integrated Realtek 8211B GbE Ethernet Controller	Controller	8211B-GR
	Memory	N/A
	Data rates supported	1 GHz data rate with X1 link width
	Compliance	IEEE802.3, IEEE 802.3u, IEEE 802.3ab
	Bus architecture	PClexpress 1.1
	Data transfer mode	Hal/Full Duplex Operation
	Hardware certifications	MS NDIS5, NDIS6, IPv4, IPv6, TCP, UDP
	Power requirement	1000 Base-T : 761.4 mW 100 Base-T: 270 mW 10 Base-T: 324.6 mW Power Savings: W link: 135 mW Link Down: 345 mW S3: 288.6 mW
	Boot ROM support	Yes, EEPROM, 1Kb, 2Kb
	Network transfer rate	10/100/1000Mbps over CAT.5 10Mbps over CAT.3 RGMII (1000Mbps) MII (100Mbps) MII (10MBps)
	Dimensions	9mm x 9mm
	Management capabilities	ACPI rev 2.0, PM rev 1.1, ASPM v1.0a
	<hr/>	
Intel PRO/1000 PT Gigabit PCIe Controller	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 Express 1.0a
	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	ASF, WOL, PXE, DMI, WFM 2.0.	

Technical Specifications - Communications

HP Wireless A+G PCI	Dimensions	4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm)
	Weight	0.268 lb (65 g)
	Controller system interface	Atheros AR5414X chipset PCI Spec 2.2
	Network standard	IEEE 802.11a/b/g
	Frequency band	5.1500 to 5.8500 GHz 2.4000 to 2.4835 GHz 2.4465 to 2.4835 GHz (Europe, Middle East, Asia and Asia Pacific – excluding Japan) 2.4000 to 2.4697 GHz (Japan)
	Operating Temperature	32° to 140° F (0° to 60° C), operating
	Storage temperature	-4° to 176° F (-20° to 80° C), non-operating
	Humidity	10% to 85% non-condensing
	Operating voltage	5V ± 5%
	Power consumption	Tx/Rx peak 560/250mA @ 3.3V (max.)
	Output power (approximately)	15 dBm ±2dB
	Receive sensitivity	-90dBm at 11 Mbps (typical)
	Data transfer rate	Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps
	Spreading	DSSS (Direct Sequence Spread Spectrum)
	Security	64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP, TKIP, WEP
	Antenna	External 5dBi antenna
	Throughput	108 Mbps (only with Belkin 54G or 200 ft (60.96 m) – Indoor above router that supports 108 Mbps speed) 54 Mbps 200 ft (60.96 m) – Indoor 11 Mbps 200 ft (60.96 m) – Indoor
	Certifications	Wi-Fi certified
	Certifications for use by country	North America: United States, Canada Europe: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom Australia, New Zealand

Technical Specifications - Communications

Agere 56K PCI Modem Data Transmission	56,000 Kbps maximum downstream data 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	14,400/12,000/9,600/7,200/4,800/2,400/300 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 Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
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 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, 3rd 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, 3rd 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

Technical Specifications - Graphics

Integrated NVIDIA GeForce 6150SE Graphics	3D/2D Controller	DX9 Graphics Processor
	VGA Controller	Single Display with Integrated DAC
	Bus Type	PCIex16
	RAMDAC	300 MHz RAMDAC
	Memory	Up to 256MB of System Memory
	Controller Clock Speed	Internal 400MHz
	Maximum Color Depth	1920 x 1440
	Maximum Vertical Refresh Rate	75Hz
	Multi-display Support	Yes
	Graphics/Video API Support	Microsoft DirectX9, DirectXVA, OpenGL 1.4

Resolutions Supported ¹	Resolution	Maximum Refresh Rate (Hz)	
		Analog Monitor	Digital Monitor
	800 x 600	75	60
	1024 x 768	75	60
	1280 x 1024	75	60
	1600 x 1200	75	60
	1920 x 1080	75	60
	1920 x 1200	75	60
	1920 x 1440	75	60
	2048 x 1536		60

¹Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).

NOTE: Other resolutions and refresh rates may be selectable but are not recommended.

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller	Bus type	PCI Express (x16 lanes)		
	Maximum vertical refresh rate	85 Hz		
	Display support	Integrated 400 MHz RAMDAC		
	Display max resolution	2048 x 1536 (analog), 2560 x 1600 (digital)		
	Input/Output connectors	DVI-I (DVI port supports dual-link and HDCP) TV-out (4 pin S-video)		
	Board display options	DVI-I + TV DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector) DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) TV connector is a 4-pin mini-DIN S-video connector		
	Board configuration	Specification	Description	
		Graphics Chip	NVIDIA GeForce 8400 GS	
		Core clock	460 MHz	
		Memory clock	200 MHz	
	Frame buffer	256 MB DDR2		

Technical Specifications - Graphics

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	25 W (Max board power)

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller 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.

Analog Resolution	Maximum Refresh Rate
640 x 480	85 Hz
800 x 600	85 Hz
1024 x 768	85 Hz
1280 x 1024	85 Hz
1600 x 1200	85 Hz
1920 x 1080	85 Hz
1920 x 1200	85 Hz
1920 x 1440	85 Hz
2048 x 1536	85 Hz
Digital Resolution	Maximum Refresh Rate
640 x 480	60 Hz
800 x 600	60 Hz
1024 x 768	60 Hz
1280 x 1024	60 Hz
1600 x 1200	60 Hz
1920 x 1200*	60 Hz
1920 x 1440**	60 Hz
2560 x 1600**	60 Hz

* Reduced blanking timings used when connected to a single-link DVI monitor

** Requires a dual-link DVI capable monitor

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	2560 x 1600 digital, 2048 x 1536 analog										
	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	<table> <thead> <tr> <th>Specification</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Graphics Chip</td> <td>RV610</td> </tr> <tr> <td>Core clock</td> <td>650 MHz</td> </tr> <tr> <td>Memory clock</td> <td>500 MHz</td> </tr> <tr> <td>Frame buffer</td> <td>256 MB DDR2, 128 bit wide</td> </tr> </tbody> </table>	Specification	Description	Graphics Chip	RV610	Core clock	650 MHz	Memory clock	500 MHz	Frame buffer	256 MB DDR2, 128 bit wide
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										

Technical Specifications - Graphics

Compliance standards

EMC Emissions:

- 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 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

Analog Resolution

640 x 480

800 x 600

1024 x 768

1280 x 768

1280 x 1024

1600 x 1024

1600 x 1200

1920 x 1080

1920 x 1200

1920 x 1440

2048 x 1536

Maximum Refresh Rate

85 Hz

85 Hz

85 Hz

85 Hz

85 Hz

85 Hz

85 Hz

85 Hz

75 Hz

85 Hz

75 Hz

Digital Resolution

640 x 480

800 x 600

1024 x 768

1280 x 768

1280 x 1024

1600 x 1024

1600 x 1200

1920 x 1200

Maximum Refresh Rate

60 Hz

60 Hz

60 Hz

60 Hz

60 Hz

60 Hz

60 Hz

60 Hz

Technical Specifications - Graphics

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
Board display options	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:	
	<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.

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

HP PS/2 or 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)
	Electrical	Weight	2 lb (0.9 kg) minimum
		Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
	Mechanical	MicrosoftPC 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
	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

Technical Specifications - Input Devices

HP USB 2-Button Laser	Scroll Wheel	24	
	Maximum Rotation Speed	48 rats/sec	
	Switch Type	wheel	
	Switch Life	Button – 3,000,000	
		Wheel – 1,000,000 times	
		Tilt switch – 500,000 times	
	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	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	
Electrical		Operating Voltage	+ 5VDC ± 5%
		Power Consumption	
	MTBF	> 150,000 hrs	
	ESD	IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV	
	EMI-RFI	FCC Class B	
	PC98	PC 99 Compliant	
	Mechanical	Resolution	800dpi
Tracking Speed		25 cm/sec	
Acceleration		0.5mm	
Switch Actuation		0.6N (60gf)	
Switch Life		Button – 3,000,000	
		Wheel – 1,000,000 times	
		Tilt switch – 500,000 times	
Cable Length		1850mm	
PC98-99	PC99 compliant		
Regulatory Approvals	UL60950-1, UL 94, UL 746 (A-E), UL 796		
	TUV/GS: EN 60950-1, EN 60825-1		
	FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL		

Technical Specifications - Input Devices

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	
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	
Regulatory approvals	Mechanical life	Minimum 200,000 revolutions	
	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)

Technical Specifications - Hard Drives

Serial ATA Hard Drives 80 GB (7200 rpm)

Capacity	80,026,361,856 bytes	
Height	1 in (2.54 cm)	
Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
Interface	Serial ATA (3.0 Gb/s)	
Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
Buffer	8 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	156,301,488	
Operating Temperature	32° to 140° F (0° to 60° 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)	
Interface	Serial ATA (3.0 Gb/s)	
Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
Buffer	8 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	312,581,808	
Operating Temperature	32° to 140° F (0° to 60° 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)	3.0 Gb/s	
Buffer	8 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	488,397,168	
Operating Temperature	41° to 131° F (5° to 55° C)	

500 GB

Capacity	500,107,862,016 bytes	
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Technical Specifications - Hard Drives

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)	3.0 Gb/s	
Buffer	8 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)	

Technical Specifications - Optical Storage

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

Technical Specifications - Optical Storage

SATA CD-RW/DVD-ROM Combo Drive	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	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)		
	Write speeds	CD-R	Up to 48X	
		CD-RW	Up to 32X	
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X	
		DVD-ROM	Up to 16X	
		CD-ROM, CD-R	Up to 48X	
		CD-RW	Up to 32X	
		Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	Full Stroke		DVD: < 250 ms (typical), CD: < 210 ms (typical)	
	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)		

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	
	Read speeds	CD-R	Up to 48X	
		CD-RW	Up to 32X	
		DVD-RAM	Up to 12X	
		DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X	

Technical Specifications - Optical Storage

	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 times (typical reads, including setting)	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
	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)

Technical Specifications - Removable Storage

1.44-MB Diskette Drive	Size	3.5 in (8.89 cm)	
	LED Indicators (front panel)	Green	
	Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
	Drive Height	One-third	
	Drive Rotation	300 rpm	
	Transfer Rate (high/low)	500/250 KB/s	
	Bytes/Sector	512	
	Sectors/Track (high/low)	18/9	
	Tracks/Side (high/low)	80/80	
	Access Times	Track-to-Track (high/low)	3/6 ms
		Average (high/low)	94/173 ms
		Settling Time	15 ms
		Latency Average	100 ms
Cylinders (high/low)	80/80		
Read/Write Heads	Two		

HP 16-in-1 Media Card Reader	USB interface	USB 2.0 High-speed device via PCI card or pass-through via internal USB port of system board	
	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 SD 4-bit parallel transfer mode • Supports high-speed 50 MHz SD 4-bit card (version 1.1) • Support high-speed 52 MHz MMC 8-bit card (version 4.x) 	
	Supported media types	<ul style="list-style-type: none"> • Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II), MicroDrive (MD) • Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), xD-Picture Card (xD) • Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC Mobile) • Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo) 	
	Mechanical	Length (3.5")	124.7 cm
		Width (3.5")	101.6 cm
		Height (3.5")	25.4 cm
		Length (5.25")	171.6 cm
		Width (5.25")	148.9 cm
		Height (5.25")	42.7 cm
	Environmental	Operational environmental extremes	Test Parameters/Conditions – Power applied, unit operating on system ±5% nominal supply voltage.

Technical Specifications - Removable Storage

10°C 10% R.H. ≥ 24 hours
10°C 90% R.H. ≥ 24 hours
20°C 90% R.H. ≥ 24 hours
30°C 90% R.H. ≥ 24 hours
40°C 90% R.H. ≥ 24 hours
50°C 90% R.H. ≥ 24 hours
50°C 10% R.H. ≥ 24 hours

Storage environmental extremes Test Parameters/Conditions
60°C @ 80% R.H. for 96 hours
-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

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. 1.2
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:

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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