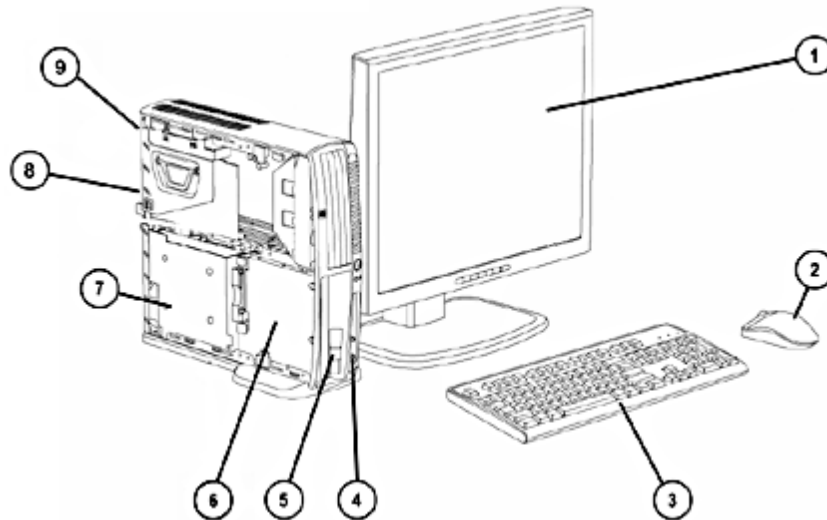


### Overview

**HP recommends  
Windows Vista™ Business**

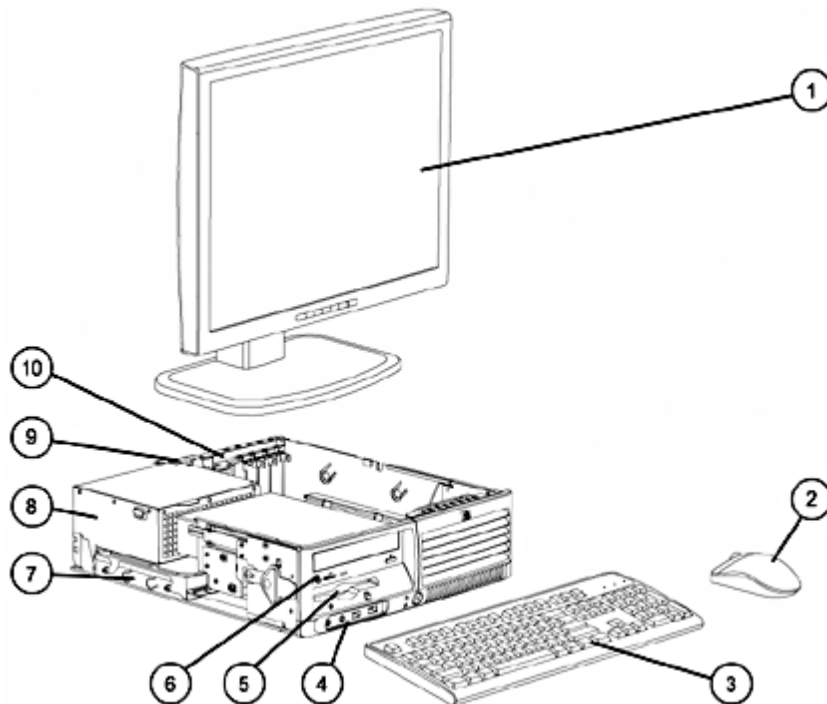
#### Ultra-slim Desktop



1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2 or USB)
3. HP Standard Keyboard (PS/2 or USB)
4. Front I/O: 2 USB 2.0, headphone and microphone
5. 1 MultiBay Drive Bay
6. 1 3.5" internal bay
7. 200-watt power supply with power harness cable incorporating 1 SATA device power connector
8. 1 full-height PCI slot (optional)
9. Rear I/O: 6 USB 2.0, 1 optional serial port (available via adapter), 1 optional parallel port (available via adapter), 1 optional DVI graphics port (available via DVI ADD2 adapter), 2 PS/2, 1 RJ-45, 1 VGA, audio in/out

### Overview

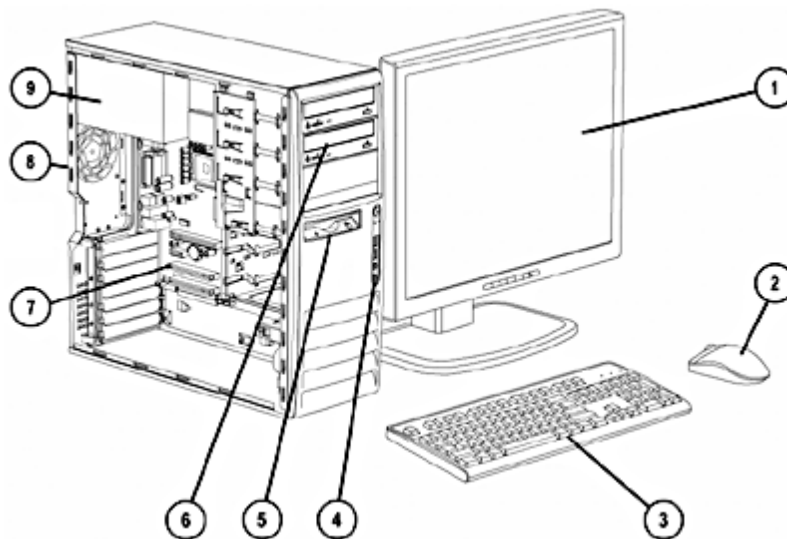
#### Small Form Factor



1. Monitor (sold separately)
  2. 2-Button Scroll Mouse (PS/2 or USB)
  3. HP Standard Keyboard (PS/2 or USB)
  4. Front I/O: 2 USB 2.0, headphone and microphone
  5. 1 3.5" external bay for optional diskette drive, HP 16-in-1 Media Card Reader, or other 3.5" device
  6. 1 5.25" external bay for optional optical drive, or other 5.25" device (bay tilts up for device removal and insertion)
  7. 1 3.5" internal bay
  8. 240-watt power supply with power harness cable incorporating 2 SATA, 1 PATA and 1 FDD device power connectors
  9. Rear I/O: 6 USB 2.0, 1 standard serial port, 1 optional serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, audio in/out
  10. 2 low profile PCI slots, 1 low profile PCI Express x1 slot, 1 low profile PCI Express x16 slot standard\*; 2 full-height PCI slots optional
- \*NOTE:** With riser card option, express x1 and x16 slots are inaccessible.

### Overview

#### Convertible Minitower



1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2 or USB)
3. HP Standard Keyboard (PS/2 or USB)
4. Front I/O: 2 USB 2.0, headphone and microphone
5. 1 3.5" external bay for optional diskette drive, HP 16-in-1 Media Card Reader, or other 3.5" device
6. 3 5.25" external bays and 2 3.5" internal bays
7. 2 full-height PCI slots, 1 full-height PCI Express x1 slot, 1 full-height PCI Express x16 slot, 2 additional full-height PCI slots optional
8. Rear I/O: 6 USB 2.0, 1 standard serial port, 1 optional serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, audio in/out, mic in
9. 365-watt power supply with power harness cable incorporating 4 SATA, 3 PATA and 1 FDD device power connectors

\* **NOTE:** HP supplied configuration with 5.25" PATA optical device provides 1 additional spare PATA device data-connector on ribbon cable.

### At A Glance

- Designed for long-term, networked deployment within medium and large organizations in commercial business, finance and public sector industries
- Choice of operating systems
- Value-added software available pre-installed:
  - HP ProtectTools Embedded Security (purchased separately)
  - HP Client Manager (<http://h18000.www1.hp.com/im/index.html>)
  - Altiris Local Recovery
  - Norton AntiVirus with 60 day Live Update Subscription
- Fully compatible software OS image across all three models (Ultra-slim Desktop, Small Form Factor, and Convertible Minitower)
- HP BIOS for security, manageability and software image stability
- Standard 3-years parts, 3-years labor and 3-years on-site warranty services (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability, HP Insight Diagnostics software, and HP Restore Plus ! CD for fast repair
- 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>)
- Intel technologies introduced in 2005: 945G Express chipset, Pentium 4, Pentium D and Celeron processors

### Overview

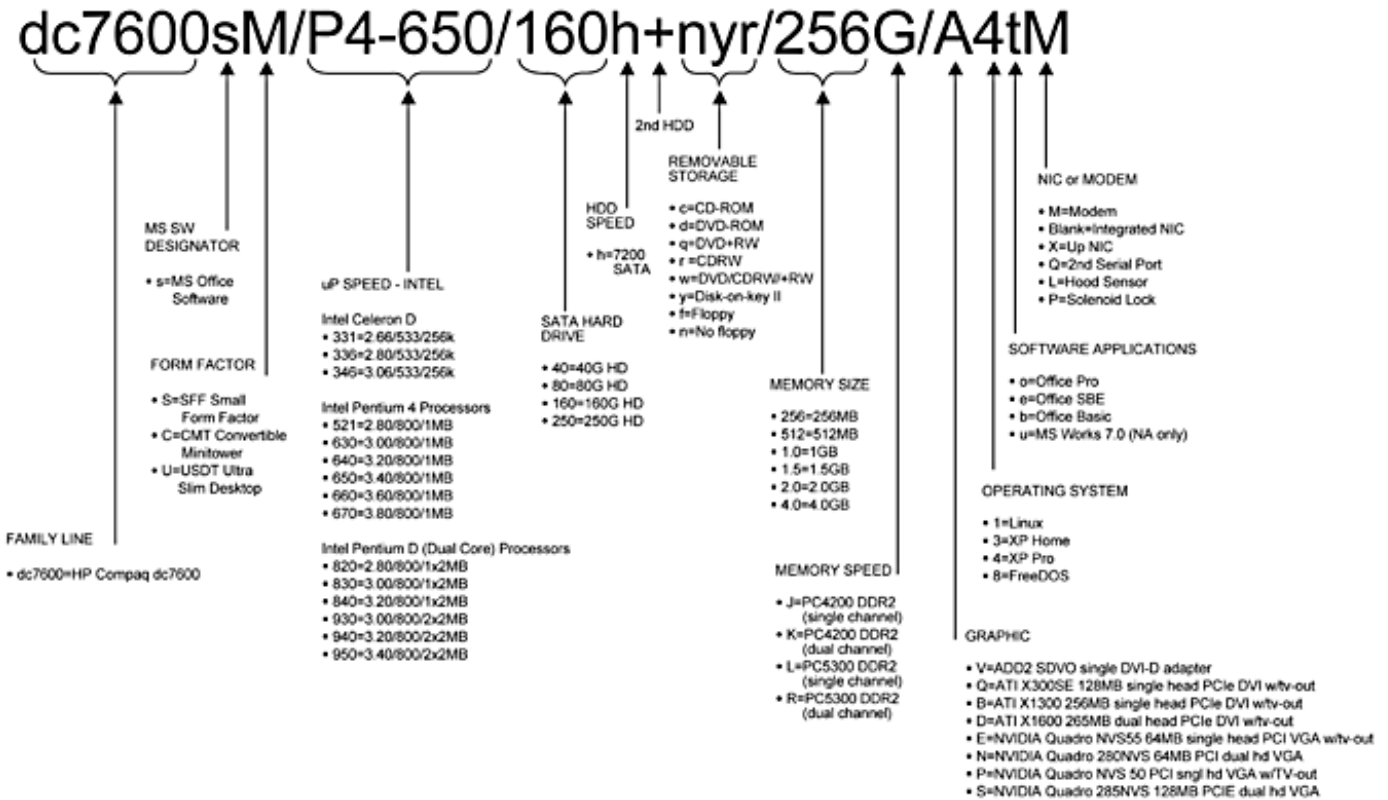
- Embedded TPM1.2 compliant security module (requires HP ProtectTools Embedded Security software)
- Support for SMART III 1.5Gb/s and 3.0Gb/s Serial ATA hard drives
- In compliance with the IEEE 1680 (EPEAT) standard at the SILVER level, see <http://www.epeat.net/>

## 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.



### Smart Buy Promotion Models

#### Ultra-slim Desktop

EN257UT#ABA	PROMO dc7600U/P4-820/80hnc/512Kv4 US
EN262UT#ABA	PROMO dc7600U/P4-820/80hnw/512K US (NVS55)
EN264UT#ABA	PROMO dc7600U/PD-945/80hnw/1.0K4 US

#### Small Form Factor

EN256UT#ABA	PROMO dc7600S/PD-820/80hnd/512K4P US
EN258UT#ABA	PROMO dc7600S/P4-945/80hnr/512K4 US
EN265UT#ABA	PROMO dc7600S/P4-945/80hnw/1.0Kv4 US (ADD2)

#### Convertible Minitower

EN261UT#ABA	PROMO dc7600C/PD-820/80hnd/512K4P US
EN259UT#ABA	PROMO dc7600C/P4-945/80hnr/512K4 US

### Configurable Components - Select Models (localized by Regions)

EN268UT#ABA	PROMO dc7600C/P4-945/80hnrw1.0Kv4 US (ADD2)
EN290UT#ABA	PROMO dc7600C/PD-820/160hnrw/1.0R US (x1300)
EN263UT#ABA	PROMO dc7600C/P4-945/160hnrq/1.0K US (x1300)
EN260UT#ABA	PROMO dc7600CPD-945/250hnrq1.0KS4 US (NVS285)
EN266UT#ABA	PROMO dc7600CPD-945/250hnrq/1.0K/D4 US (x1600)

#### **Standard Models**

##### **Small Form Factor**

WW-AF854AW#ABA	dc7600S/C336/40hnc/256J/4 US
AG156AW#ABA	dc7600S/P4-630/40hnc/512K/4 US
AF878AA#ABA	dc7600S/P4-521/40hnc/512K/4 US
AF879AA#ABA	dc7600S/P4-521/40hnd/512K/4 US
WW-AF850AW#ABA	dc7600S/P4-630/80hnc/512K/4 US
WW-AF851AW#ABA	dc7600S/P4-630/80hnd/512K/4 US
WW-AF852AW#ABA	dc7600S/P4-630/80hnrw/512K/4 US
AF877AA#ABA	dc7600S/P4-640/80hnrw/512K/4 US
WW-AF853AW#ABA	dc7600S/P4-640/80hnrw/1.0K/4 US
EN130UA#ABA	dc7600S/P4-630/80hnc/1.0K/4 US
EN312UA#ABA	dc7600S/P4-541/80hnd/1.0k/4 US
EN313UA#ABA	dc7600S/P4-820/80hnd/1.0k/4 US
EN314UA#ABA	dc7600S/P4-820/80hnrw/1.0k/4 US
EN315UA#ABA	dc7600S/P4-945/80hnrw/1.0K/4 US

##### **Convertible Minitower**

AF873AA#ABA	dc7600C/P4-521/40hnc/512K/4 US
AF874AA#ABA	dc7600C/P4-521/40hnr/512K/4 US
AG155AW#ABA	dc7600C/P4-630/40hnc/512K/4 US
WW-AF842AW#ABA	dc7600C/P4-630/80hnd/512K/4 US
WW-AF843AW#ABA	dc7600C/P4-630/80hnc/512K/4 US
WW-AF845AW#ABA	dc7600C/P4-630/80hnrw/512K/4 US
WW-AF844AW#ABA	dc7600C/P4-640/80hnd/512K/4 US
AF872AA#ABA	dc7600C/P4-640/80hnrw/512K/4 US
WW-AF846AW#ABA	dc7600C/P4-640/80hnrw/1.0K/4 US
EN132UA#ABA	dc7600C/P4-630/80hnc/1.0K/4 US
EN316UA#ABA	dc7600C/P4-541/80hnd/1.0k/4 US
EN317UA#ABA	dc7600C/P4-820/80hnd/1.0k/4 US
EN318UA#ABA	dc7600C/P4-820/80hnrw/1.0k/4 US
EN319UA#ABA	dc7600C/P4-945/80hnd/1.0k/4 US
EN320UA#ABA	dc7600C/P4-945/80hnrw/1.0k/4 US

### Configurable Components - Select Models (localized by Regions)

#### Ultra-slim Desktop

WW-AF918AW#ABA	dc7600U/C336/40hnc/256J/4 US
AF880AA#ABA	dc7600U/P4-521/40hn/256J/4 US
AF881AA#ABA	dc7600U/P4-521/40hnc/512K/4 US
AG157AW#ABA	dc7600U/P4-630/40hn/256J/4 US
AG158AW#ABA	dc7600U/P4-630/40hnc/512K/4 US
WW-AF857AW#ABA	dc7600U/P4-630/80hnd/512K/4 US
EN131UA#ABA	dc7600U/P4-630/80hnc/1.0K/4 US
EB307UA#ABA	dc7600U/P4-541/80hn/1.0k/4 US
EB309UA#ABA	dc7600U/P4-820/80hn/1.0k/4 US
EB308UA#ABA	dc7600U/P4-541/80hnc/1.0k/4 US
EB310UA#ABA	dc7600U/P4-820/80hnc/1.0k/4 US
EB311UA#ABA	dc7600U/P4-820/80hnd/1.0k/4 US

### Configurable Components

**Operating System -** One of the following

- Genuine Windows XP Professional SP2
- Genuine Windows XP Home SP2
- SuSE Linux Personal 9.3 OEM (delivered on CDs with system, not pre-installed)- WW except Asia
- FreeDOS

**NOTE:** Microsoft Windows NT 4.0 and Microsoft Windows 2000 are not available on these systems. Some drivers for Windows 2000 are available for download from [hp.com](http://hp.com).

<b>Value-added Software</b> (not included with FreeDOS)	HP ProtectTools Embedded Security software	Microsoft Office 2003 Professional
	HP Client Management Solutions (visit <a href="http://www.hp.com/go/easydeploy">http://www.hp.com/go/easydeploy</a> )	Microsoft Office 2003 Small Business
	HP Restore CD	Microsoft Works 7.0
	HP Insight Diagnostics	Microsoft Internet Explorer
	Computer Setup Utility	Dantz Retrospect and Roxio DigitalMedia Plus (supplied with CD-RW drive, Combo drive or DVD+/-RW drive)
	Altiris Local Recovery	Roxio Cineplayer (supplied with DVD-ROM drive)
	Norton AntiVirus 2005 with 60 day Live Update Subscription	QuickBooks Simple Start
	Microsoft Office 2003 Basic	
Microsoft Office 2003 Personal		

<b>Value-added Services and Features</b>	HP Stable Platform Program	Factory Express Deployment and Lifecycle Services
	Business-to-Business Portals	TPM 1.2 Security
	HP Global Series Services	Tool-less Serviceability

**Service and Support** On-site Warranty and Service [Note 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 [Note 2](#) and includes free telephone support [Note 3](#) 24 x 7. Global coverage [Note 2](#) 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.

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

**NOTE 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.

**NOTE 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.

	<b>Ultra-slim Desktop</b>	<b>Small Form Factor</b>	<b>Convertible Minitower</b>
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### Configurable Components

<b>Dimensions</b>			
Chassis Dimensions (H x W x D)	2.95 x 12.4 x 13.18 in (7.49 x 31.50 x 33.48 cm)	3.95 x 13.3 x 14.9 in (10.03 x 33.78 x 37.85 cm)	17.65 x 6.6 x 17.8 in (44.83 x 16.76 x 45.21 cm)
System weight	13.2 lb (5.99 kg)	19.5 lb (8.85 kg)	32.5 lb (14.74 kg)
System volume	7.9 liters	12.8 liters	33.8 liters
Shipping weight	19 lb (8.62 kg)	30 lb (13.61 kg)	43 lb (19.50 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)	12.63 x 18.75 x 20 in (32.08 x 47.63 x 50.8 cm)	12.63 x 18.75 x 20 in (32.08 x 47.63 x 50.8 cm)	23.38 x 13.06 x 22.88 in (59.39 x 33.17 x 58.12 cm)
<b>Power Supply</b>			
	190W power supply – Active PFC	240W power supply – Active PFC	365W power supply - Active PFC
<b>Ports</b>			
USB 2.0	8 (2 front, 6 rear)	8 (2 front, 6 rear)	8 (2 front, 6 rear)
Serial	1 optional via Serial & parallel I/O adapter	1 standard with 2nd optional	1 standard with 2nd optional
Parallel	1 optional via Serial & parallel I/O adapter	1	1
PS/2	1 keyboard, 1 mouse	1 keyboard, 1 mouse	1 keyboard, 1 mouse
Video	analog for integrated graphics	analog for integrated graphics	analog for integrated graphics
DVI output	available via ADD2 card or PCI card	available via ADD2 card, PCI-E x16 card, or PCI card	available via ADD2 card, PCI-E x16 card, and PCI card
Support for Multi-Monitor	available via ADD2 card or PCI card	available via ADD2 card, PCI-E x16 card, or PCI card	available via ADD2 card, PCI-E x16 card, and PCI card
Audio	Front - mic and headphone Rear - line in, line out	Front - mic and headphone Rear - line in, line out	Front - mic and headphone Rear - line in, line out, mic in
NIC (RJ-45)	Integrated Broadcom NetXtreme Gigabit Ethernet for HP	Integrated Broadcom NetXtreme Gigabit Ethernet for HP	Integrated Broadcom NetXtreme Gigabit Ethernet for HP

		USDT	SFF	CMT
<b>Processor and Speed*</b> One of the following	<b>Intel Celeron D Processors:</b>			
	Intel Celeron D 331 Processor (2.66-GHz, 256K L2 cache, 533-MHz FSB)	X	X	X
	Intel Celeron D 336 Processor (2.80-GHz, 256K L2 cache, 533-MHz FSB)	X	X	X
	Intel Celeron D 336 Processor (3.0-GHz, 256K L2 cache, 533-MHz FSB)	X	X	X
	Intel Celeron D 346 Processor (3.06-GHz, 256K L2 cache, 533-MHz FSB)	X	X	X
	<b>Intel Pentium 4 Processors with HT Technology:</b>			
	Intel Pentium 4 521 Processor (2.8-GHz, 1-MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium 4 524 Processor (3.06-GHz, 1-MB L2 cache, 533-MHz FSB)	X	X	X
	Intel Pentium 4 541 Processor (3.2-GHz, 1-MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium 4 620 Processor (2.8-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium 4 630 Processor (3.0-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium 4 631 Processor (3.0-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium 4 640 Processor (3.2-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium 4 641 Processor (3.2-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium 4 650 Processor (3.4-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X	

### Configurable Components

Intel Pentium 4 651 Processor (3.4-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium 4 660 Processor (3.6-GHz, 2-MB L2 cache, 800-MHz FSB)			X
Intel Pentium 4 661 Processor (3.6-GHz, 2-MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium 4 670 Processor (3.8-GHz, 2-MB L2 cache, 800-MHz FSB)			X
<b>Intel Pentium D Dual Core Processors:</b>			
Intel Pentium D 805 Dual Core Processor (2.66-GHz, 2x1MB L2 cache, 533-MHz FSB)	X	X	X
Intel Pentium D 820 Dual Core Processor (2.8-GHz, 2x1MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium D 830 Dual Core Processor (3.0-GHz, 2x1MB L2 cache, 800-MHz FSB)			X
Intel Pentium D 840 Dual Core Processor (3.2-GHz, 2x1MB L2 cache, 800-MHz FSB)			X
Intel Pentium D 915 Dual Core Processor (2.8-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium D 925 Dual Core Processor (3.0-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium D 930 Dual Core Processor (3.0-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium D 940 Dual Core Processor (3.2-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium D 945 Dual Core Processor (3.4-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
Intel Pentium D 950 Dual Core Processor (3.4-GHz, 2x2MB L2 cache, 800 MHz FSB)	X	X	X

**\*NOTE:** Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

### Memory

#### 945G Express chipset

#### 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 Intel 945G Express chipsets support non-ECC DDR2 PC2-4200 (533-MHz) and PC2-5300 (667-MHz) memory.

**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.

### Ultra-Slim Desktop

#### Maximum Memory

Supports up to 3-GB of DDR2 SYNCH DRAM. *Not all memory configurations possible are represented below.*

### Configurable Components

DIMM Size	Slot		
	Channel A		Channel B
	1	2	3
256-MB	256-MB		
512-MB	512-MB		
512-MB (dual-channel symmetric)	256-MB		256-MB
1-GB	1-GB		
1-GB (dual channel symmetric)	512-MB		512-MB
1-GB (dual channel symmetric)	512-MB	256-MB	256-MB
2-GB (dual channel symmetric)	1-GB	512-MB	512-MB
3-GB maximum	1-GB	1-GB	1-GB

### Small Form Factor and Convertible Minitower

#### Maximum Memory

Supports up to 4-GB of DDR2 SYNCH DRAM. *Not all memory configurations possible are represented below.*

**NOTE:** Above 3-GB, all memory may not be available due to system resource requirements.

DIMM Size	Slot			
	Channel A		Channel B	
	1	2	3	4
256-MB	256-MB			
512-MB	512-MB			
512-MB (dual-channel symmetric)	256-MB		256-MB	
1-GB	1-GB			
1-GB (dual-channel symmetric)	512-MB		512-MB	
1-GB (dual-channel symmetric)	256-MB	256-MB	512-MB	
2-GB (dual-channel symmetric)	1-GB		512-MB	512-MB
2-GB (dual-channel symmetric)	512-MB	512-MB	512-MB	512-MB
4-GB maximum (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB

### Configurable Components

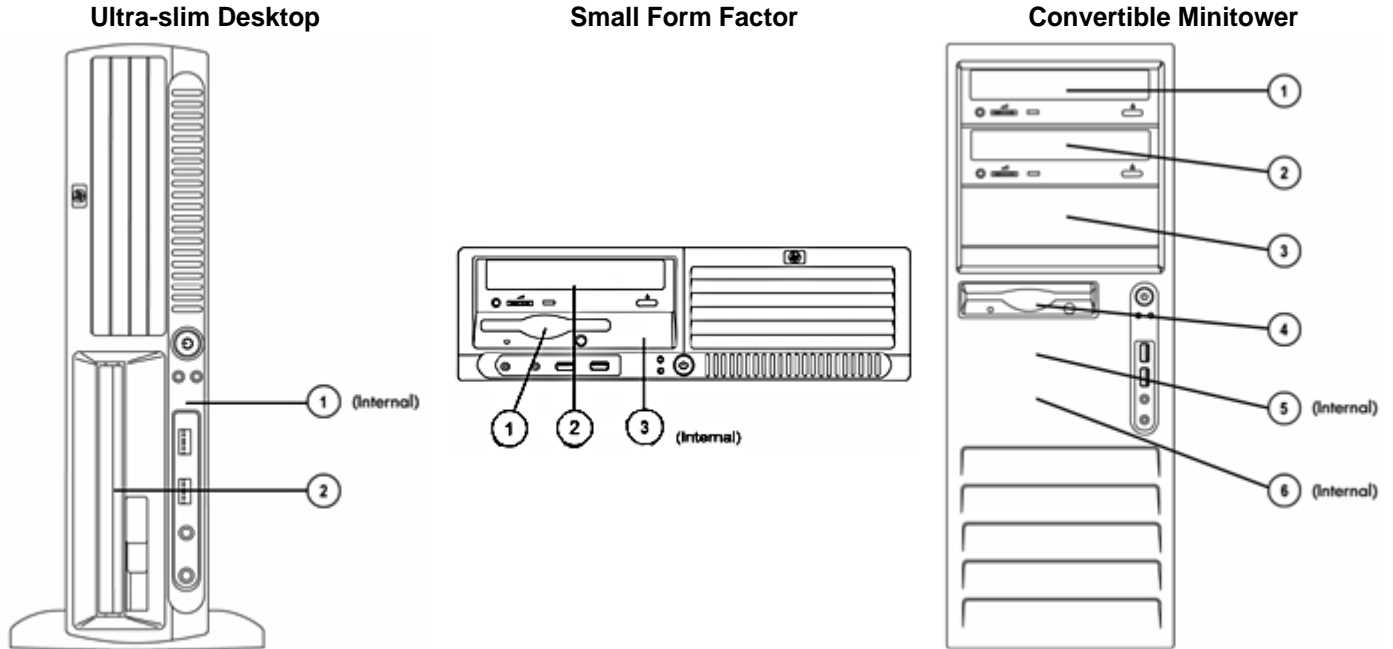
#### Memory Configurations

		USDT	SFF	CMT
– One of the following	256-MB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (1 x 256)	X	X	X
	512-MB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (1 x 512)	X	X	X
	512-MB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (2 x 256)	X	X	X
	1-GB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (1 x 1GB)	X	X	X
	1-GB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (2 x 512)	X	X	X
	2-GB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (4 x 512)		X	X
	3-GB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (3 x 1GB)	X		
	4-GB DDR2 Synch Dram PC2-4200 (533-MHz) Non ECC (4 x 1GB)		X	X
	256-MB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (1 x 256)	X	X	X
	512-MB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (1 x 512)	X	X	X
	512-MB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (2 x 256)	X	X	X
	1-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (2 x 512)	X	X	X
	2-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (4 x 512)		X	X

Expandability	USDT	SFF	CMT
PCI slots	Optional with riser card: 1 full-height (4.2"), length (6.6")	2 low-profile (2.5"), length (6.6") standard; 2 full-height (4.2"), length (6.875") via optional riser card. <b>NOTE: With riser card option, express x1 and x16 slots are not accessible.</b>	2 full-height (4.2"), length (13.4") standard; (2 additional full-height slots available via optional extender card)
Max power per slot	25W	25W	75W
PCI Express x16 slot	--	1 low-profile (2.5"), length (6.6")	1 full-height (4.2"), length (10.5")
Max power per slot	N/A	25W	75W
PCI Express x1 slot	--	1 low profile (2.5"), length (6.6")	1 full-height (4.2"), length (13.4")
Max power per slot	N/A	10W	10W
External Bays	0 (use MultiBay)	2	4
3.5"	N/A	1	1
5.25"	N/A	1 (length 8.189")	3 (2 - length 8.189", 1 - length 5.71")
MultiBay	1 standard	none	none
IDE	1 IDE for Multibay I (12 mm)	1 IDE connector for opticals	1 IDE connectors for opticals
Internal 3.5" HDD Bays	1	1	2
Hard Drive Controller (PCI) Supported	Serial ATA (support for SATA 1.5-Gb/s and 3.0-Gb/s hard drives)		
Hard Drive Interfaces Supported	1 Serial ATA interface	2 Serial ATA interfaces	2 Serial ATA interfaces

### Configurable Components

#### Storage Diagrams



#### Storage – Drive Support

	USDT			SFF			CMT	
	MultiBay Drive Bay	3.5" Serial ATA Hard Drive	Diskette Drive or Media Card Reader (optional)	Storage Drive Bay	3.5" Serial ATA Hard Drives	Diskette Drive or Media Card Reader	Storage Drive Bay	3.5" Serial ATA Hard Drives
Quantity Supported	1	1	1	1	2	1	2	2
Position Supported	(2)	(1)	(1)	(2)	(1), (3)	(4)	(1), (2), (3)	(4), (5), (6)
Controller	IDE	SATA	Diskette	IDE	SATA	Diskette	IDE	SATA

		USDT	SFF	CMT
Hard Drive One or two of the following	40-GB SATA 1.5-Gb/s Hard Drive (7200 rpm)	X	X	X
	80-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X	X
	160-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X	X
	250-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X	X
	2nd hard drive, 80-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)		X	X
	2nd hard drive, 160-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)		X	X
	2nd hard drive, 250-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)		X	X

### Configurable Components

<b>Removable Storage –</b> One or more of the following depending on form factor (see Storage section below)	<b>Diskette Drives</b>				
		1.44-MB Diskette Drive	X	X	
	<b>Media Reader</b>				
		HP 16-in-1 Media Reader (PCI card supplies internal USB connection)	X	X	
	<b>Optical Drives</b>				
		48X CD-ROM Drive	X	X	
		48X/32X/48X CD-RW Drive	X	X	
		48X/32X Combo CD-RW/DVD-ROM Drive	X	X	
		16X/48X DVD-ROM Drive	X	X	
		16X DVD+/-RW LightScribe Drive (Double Layer/Dual Format)	X	X	
		<b>MultiBay</b>			
		MultiBay 24X CD-ROM Drive	X		
	MultiBay 24X/24X/24X/8X DVD-CDRW Combo Drive	X			
	MultiBay 8X/24X DVD-ROM Drive	X			
<b>Security</b>		1.2 TPM Embedded Security Chip integrated with Broadcom NIC	X	X	X
		HP ProtectTools Embedded Security Software	X	X	X
		Serial, Parallel, USB Enable/Disable (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 Lock (electronic hood lock)		X	X
		Hood Removal Sensor	X	X	X
		HP Desktop Security lock kit (lock and cable)	X	X	X
	Security cable with Kensington lock	X	X	X	
<b>NIC</b>		Broadcom NetXtreme Gigabit Ethernet integrated on system board	X	X	X
		Intel PRO/1000 GT Gigabit PCI Adapter (full height bracket)			X
		Intel PRO/1000 GT Gigabit PCI Adapter (low profile bracket)	X	X	
		Intel Pro 1000GTGb NIC PCI	X	X	X
<b>Wireless</b>		Wireless A+G PCI Card (full height bracket)	X*		X
		Wireless A+G PCI Card (low profile bracket)		X	
	<b>NOTE:</b> *Requires optional PCI riser card.				
<b>Modem</b>		2006 Agere PCI 56K International SoftModem (full height)	X*	X*	X
		2006 Agere PCI 56K International SoftModem (low profile)		X	
		<b>NOTE:</b> *Requires optional PCI riser card.			

### Configurable Components

<b>Graphics</b>	Integrated Intel Graphics Media Accelerator 950	X	X	X
	DVI ADD2 SDVO single head Graphics Adapter for USDT	X		
	DVI ADD2 SDVO single head Graphics Adapter (PCI-E x16)		X	X
	ATI RADEON X300 SE PCI Express 128-MB DDR single head DVI with TV out		X	X
	ATI RADEON X1300 256MB PCIe DVI w/TV		X	X
	ATI RADEON X1600XT 256MB, full-height PCIe, dual DVI w/TV-out			X
	NVIDIA Quadro NVS 280 64-MB PCI dual head VGA	X*	X	X
	NVIDIA Quadro NVS 285 128-MB PCIe x16 dual head VGA		X	X
	NVIDIA Quadro 55 NVS 64MB PCI low profile DVI w/TV-Out	X*		

**NOTES:**

\*Requires optional PCI riser card.

\*\* NVS 280 PCI can be selected as a second graphics card when the NVIDIA Quadro NVS 285 is also installed, to provide support for four monitors

<b>Audio</b>	Integrated High Definition audio with Realtek 2 channel ALC260 codec (all ports are stereo)	X	X	X
	Microphone and Headphone front ports	X	X	X
	Microphone rear port*	X	X	X
	Line-out and Line-In rear ports*	X	X	X
	Aux Input connection on system board	X	X	X
	Analog CD IN Support	X**		
	Internal Speaker	X	X	X

**NOTE:** \*Rear audio ports are re-taskable as Line-in, Line-out, or Microphone-in, with optional driver, available only through download from HP support website. External speakers must be powered externally.

\*\* Available on USDT through MultiBay

<b>Keyboard –</b> One of the following	HP PS/2 Standard Keyboard	X	X	X
	HP USB Standard Keyboard	X	X	X
	HP USB Smartcard Keyboard	X	X	X

<b>Mouse –</b> One of the following	PS/2 2-Button Scroll Mouse	X	X	X
	PS/2 2-Button Optical Scroll Mouse	X	X	X
	USB 2-Button Optical Scroll Mouse	X	X	X
	USB 2-Button Scroll Mouse	X	X	X

### Configurable Components

<b>Miscellaneous</b>	HP FireWire / IEEE 1394 PCI Card (full height)	X*	X	X
	HP FireWire / IEEE 1394 PCI Card (low profile)		X	
	PCI riser card – adds 1 full-height PCI slot	X		
	PCI riser card – adds 2 full-height PCI slots		X	
	<b>NOTE:</b> Low profile slots are unusable with riser card installed.			
	PCI extender card for CMT (adds 2 PCI)			X
	PCI Serial & parallel I/O adapter	X*		
	2nd serial port adapter (full height)			X
	2nd serial port adapter (low profile)		X	
	Tower stand	X	X	
	Configure dc7600 CMT in desktop orientation			X
	HP 16-In-1 3.5 Media Card Reader with PCI		X	X
	<b>NOTE:</b> *Requires optional PCI riser card.			



### After-Market Options

		USDT	SFF	CMT	Part Number
<b>Communications</b>	<b>Wireless LAN</b>				
	HP Wireless A+G PCI Card	X	X	X	EA118AA
	HP bt450 USB Bluetooth Wireless Printer and PC Adapter (IPG)	X	X	X	Q6398A#ABA
	<b>NICs</b>				
	Intel Pro 1000 PT Gb Ethernet PCIe NIC	X	X	X	EH352AA
	<b>Modem</b>				
	2006 Agere PCI 56K International Modem	X	X	X	EK694AA
<b>Connectivity</b>					
	Bundle Connectivity Starter Kit - Surge Protector/LAN cable/Printer cable	X	X	X	RT174AA
<b>Office 2007 Media-less License Kits (MLKs)</b>	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
<b>Graphics</b>	<b>Single head solutions</b>				
	DVI ADD2 Graphics Card (PCI-E x16)		X	X	DY674A
	ATI RADEON X1300 256MB DDR PCIE DVI w/TV		X	X	AG392AA
	ATI Radeon X1300 256MB DH PCIe Graphics Card		X	X	AH050AA
	NVIDIA Quadro 55 NVS 64MB PCI DVI w/TV Out	X*	X	X	EK561AA
	<b>Multi head solutions</b>				
	NVIDIA Quadro NVS 280 64-MB PCI dual head (DMS59 connector with dual VGA Y-cable)		X	X	DY599A
Dual DVI Y-cable for DY599A or AH050AA		X	X	DL139A	
	<b>NOTE:</b> *Requires optional PCI riser card.				
<b>Hard Drives</b>	<b>Serial ATA Hard Drives</b>				
	80-GB SATA 3.0-Gb/s Hard Drive	X	X	X	PY276AA
	160-GB SATA 3.0-Gb/s Hard Drive	X	X	X	PY277AA
	250-GB SATA 3.0-Gb/s Hard Drive	X	X	X	PY278AA

### After-Market Options

<b>Input/Output Devices</b>	<b>Keyboards</b>				
	HP PS/2 Standard Keyboard	X	X	X	DT527A#ABA
	HP USB Standard Keyboard	X	X	X	DT528A#ABA
	HP USB BG1650 Standard Keyboard	X	X	X	DT529A#ABA
	HP USB Smartcard Keyboard	X	X	X	ED707AA#ABA
	<b>Pointing Devices</b>				
	HP PS/2 2-Button Scroll Mouse (Carbonite)	X	X	X	DD440B
	HP PS/2 2-Button Optical Scroll Mouse	X	X	X	EY703AA
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	X	X	X	DC172B
<hr/>					
<b>Memory (DIMMs)</b>	<b>PC2-5300 (DDR2, 667 MHz) DIMMs Non-ECC</b>				
	1 GB PC2-5300 (DDR2-667) DIMM	X	X	X	PX976AA
	512 MB PC2-5300 (DDR2-667) DIMM	X	X	X	PX975AA
	256 MB PC2-5300 (DDR2-667) DIMM	X	X	X	PX974AA
<hr/>					
<b>Monitors</b>	<b>CRTs</b>				
	HP s7540 17" (16.0" vis) CRT Monitor				PF997AA#ABA
	<b>TFTs</b>				
	HP L1506 15" TFT Flat Panel Monitor – Analog only				PX848AA#ABA
	HP L1706 17" TFT Flat Panel Monitor – Analog only				PX849AA#ABA
	HP L1740 17" TFT Flat Panel Display – Analog/Digital				PL766AA#ABA
	HP L1745 17" TFT Flat Panel Display – Analog/Digital				GE178AA#ABA
	HP L1906 19" TFT Flat Panel Display – Analog only				PX850AA#ABA
	HP L1940T 19" TFT Flat Panel Display – Analog/Digital				EM869AA#ABA
	HP LP1965 19" TFT Flat Panel Display – Analog/Digital				RA373AA#ABA
	HP LP2065 20" TFT Flat Panel Display – Analog/Digital				EF227A4#ABA
	<b>Widescreen TFTs</b>				
	HP L2045w 20" Widescreen Flat Panel Display – Analog/Digital				RD125AA#ABA
	HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital				EF224A4#ABA
	HP LP3065 30" TFT Widescreen Flat Panel Display – Analog/Digital				EZ320A4#ABA
	<b>GSA Monitors</b>				
	3PO Offering				
	<b>Touchscreen TFT</b>				
	HP L5006tm 15" Touch Screen Flat Panel Display				RB146AA#ABA
	<b>Options</b>				
	HP Flat Panel Speaker Bar				EE418AA
<hr/>					
<b>Multimedia</b>	HP USB Powered Speakers	X	X	X	RD628AA
	Flat Panel Speaker Bar	X	X	X	EE418AA

### After-Market Options

<b>Optical Drives</b>	<b>DVD-ROM Drive</b>				
	16X/48X DVD-ROM Drive	X	X		PR596A
	<b>Combo Drive</b>				
	48X/32X Combo CD-RW/DVD-ROM Drive	X	X		DL976B
<b>DVD+/-RW Drive</b>					
	16X DVD+/-RW LightScribe Drive (Double Layer/Dual Format)	X	X		PR595A
<hr/>					
<b>Removable Storage</b>	<b>Diskette and Digital Drives</b>				
	1.44-MB USB Diskette Drive – External (Carbonite)	X	X	X	DC141B
	1.44 MB Internal Floppy Drive for CMT/MT			X	AG295AA
	1.44 MB Internal Floppy Drive for SFF/ST	X			AG296AA
	<b>Multimedia</b>				
HP 16-in-1 Media Card Reader with PCI Card	X	X		EM718AA	
<hr/>					
<b>MultiBay Drive Storage</b>	Multibay 1.44-MB Diskette Drive	X			DE612B
	MultiBay 24X/24X/24X/8X Combo DVD-ROM/CD-RW Drive	X			DL974B
	MultiBay 8X DVD-ROM Drive	X			DC515B
	HP MultiBay 8X DVD+/-RW (DL/DF) Drive	X			AG284AA
<hr/>					
<b>Security</b>	Kensington lock	X	X	X	PC766A
	HP Business PC Security Lock	X	X	X	EV265AA
	Wall mount/security sleeve (USDT)	X			PA719A
	Wall mount/security sleeve (SFF)		X		PA717A
	HP USB Smartcard Keyboard	X	X	X	ED707AA#ABA
	USB Biometric Finger Reader	X	X	X	EM717AA
	Solonoid Lock		X		PT839AA
	Solonoid Lock			X	DE618A
Protect Tools	X	X	X	RG984AA	

### After-Market Options

<b>Software</b>	HP Credential Manager for ProtectTools (includes Embedded Security for ProtectTools TPM enabling software)	X	X	X	EM530AA (use EM531AA for 25-user license, EM532AA for 50-user license)
	HP Client Foundation Suite Includes: HP Client Manager HP Systems Insight Manager Connector Altiris Local Recovery Pro Altiris Migration Suite	X	X	X	EF117AA (use EF118AA for 1000+ licenses)
	HP Client Premium Suite Includes: HP Client Manager HP Systems Insight Manager Connector Altiris Local Recovery Pro Altiris Migration Suite Altiris Connector Solution Altiris Client Management Suite Level 1 HP OpenView Connector	X	X	X	EF119AA (use EF120AA for 1000+ licenses)
<b>Brackets/Stand</b>	HP Compaq 7000 Series Ultra-slim Desktop Integrated Work Center Stand (no display)	X			DL641B
	Tower Stand-Carbonite		X		PS797A
	5.25" Blank Bezel Kit (Carbonite 50/Bulk Pack)		X	X	DC177B
<b>Miscellaneous Accessories</b>	Serial and parallel I/O adapter (USDT)	X			PD825A
	2 <sup>nd</sup> serial port adapter		X	X	PA716A
	USB to serial adapter cable	X	X	X	EM449AA
	PCI riser card (USDT)	X			ED247AA
	PCI riser card (SFF)		X		PD824A
	PCI extender card (CMT)			X	DC179B
	HP FireWire / IEEE 1394 PCI Card	X	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
DVI to DVI Cable		X	X	DC198A	

### After-Market Options

<b>HP Care Pack Services</b>	9x5 Next-Business-Day On-Site Coverage - 4 Years	U7897E
	9x5 Next-Business-Day On-Site Coverage - 5 Years	U7899E
	9x5, 4-Hour Response On-Site Coverage - 3 Years	U4863E
	9x5, 4-Hour Response On-Site Coverage - 4 Years	U7902E
	9x5, 4-Hour Response On-Site Coverage - 5 Years	U7904E
	24x7, 4-Hour Response On-Site Coverage - 3 Years	H4493E
	24x7, 4-Hour Response On-Site Coverage - 4 Years	U7906E
	24x7, 4-Hour Response On-Site Coverage - 5 Years	U7908E
	9x5 Next-Business-Day On-Site Coverage - 4 Years + Monitor	U7896E
	9x5 Next-Business-Day On-Site Coverage - 5 + Monitor	U7898E
	9x5, 4-Hour Response On-Site Coverage - 3 Years + Monitor	U4864E
	9x5, 4-Hour Response On-Site Coverage - 4 Years + Monitor	U7901E
	9x5, 4-Hour Response On-Site Coverage - 5 Years + Monitor	U7903E
	24x7, 4-Hour Response On-Site Coverage - 3 Years + Monitor	H4483E
	24x7, 4-Hour Response On-Site Coverage - 4 Years + Monitor	U7905E
	24x7, 4-Hour Response On-Site Coverage - 5 Years + Monitor	U7907E
	Hardware Installation	U5869E
	Hardware Installation - (2 or more)	U5870E
	Post Warranty 9x5 Next-Business-Day On-Site Coverage - 1 Year	U5864PE
	Post Warranty 9x5 Next-Business-Day On-Site Coverage - 1 Year + Monitor	U5865PE

### Technical Specifications

Unit Environment and Operating Conditions	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
General Unit Operating Guidelines			
<ul style="list-style-type: none"> <li>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.</li> <li>Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.</li> <li>Never restrict airflow into the computer by blocking any vents or air intakes.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul>			
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)		
<p><b>*NOTE:</b> 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.</p>			

Power Supply	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
Power Supply	200 watt custom power supply – Active PFC)	240 watt custom power supply – Active PFC	365 watt custom power supply – 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	4A	5A	6A
Heat Dissipation	Typical 340 btu/hr (86 kg-cal/hr) Maximum 1050 btu/hr (265 kg-cal/hr)	Typical 340 btu/hr (86 kg-cal/hr) Maximum 1260 btu/hr (318 kg-cal/hr)	Typical 375 btu/hr (95 kg-cal/hr) Maximum 1916 btu/hr (483 kg-cal/hr)
Power Supply Fan	70mm variable speed	80mm variable speed	92mm variable speed
Energy Star Compliant	X	X	X
Blue Angel Compliant (<5w in S5 – Power Off)	X	X	X
FEMP Standby Power Compliant (<2W in S5 – Power Off)**	X	X	X
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	< 3W	< 3W	< 3W

### Technical Specifications

Environmental and Mechanical Engineering Support Center (EMESC) – Intranet Web Site only

<http://env-webserver.ccm.cpqcorp.net/EMESC/default.htm>

**\*\*NOTE:** Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled").

### ROM BIOS Information

Key features of the HP BIOS in the dc7600 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.
- 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 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, subversion of OS security policies, removal of hardware, flash of rogue BIOS images, master boot record viruses, and attacks on BIOS settings.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies to assist in operating the HP Business Desktop computer in any enterprise environment.
- 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 (ROMPAQ, Flashlite), BIOS updates from within Windows (CPQFlash, SSM), and fail-safe recovery.

### Additional HP BIOS Features

- Power-On password – Helps prevent an unauthorized user from powering on the system. After a power-on password is established, the user is required to type the password 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 dc7600 models use ACPI to provide power conservation features under Windows XP.

Other Features	Description
ACPI-Ready Hardware	Advanced Configuration and Power Management Interface (ACPI). <ul style="list-style-type: none"> <li>• Allows the system to wake from a low power mode.</li> <li>• 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.</li> </ul>
SMBIOS Ver. 2.4	System Management BIOS, previously known as DMI 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

### Technical Specifications

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	
<ul style="list-style-type: none"> <li>System/Emergency ROM</li> </ul>	<ul style="list-style-type: none"> <li>Flash ROM</li> </ul>	<ul style="list-style-type: none"> <li>CMOS Battery Holder for easy Replacement</li> </ul>
<ul style="list-style-type: none"> <li>Flash Recovery with Video Configuration Record SW</li> </ul>	<ul style="list-style-type: none"> <li>5 Aux Power LED on System PCA</li> </ul>	<ul style="list-style-type: none"> <li>Processor ZIP Socket for easy Upgrade</li> </ul>
<ul style="list-style-type: none"> <li>Over-Temp Warning on Screen (Requires IM Agents)</li> </ul>	<ul style="list-style-type: none"> <li>Clear Password Jumper</li> </ul>	<ul style="list-style-type: none"> <li>DIMM Connectors for easy Upgrade</li> </ul>
<ul style="list-style-type: none"> <li>OS CD (Restore OS CD)</li> </ul>	<ul style="list-style-type: none"> <li>Clear CMOS Button</li> </ul>	<ul style="list-style-type: none"> <li>NIC LEDs (integrated) (Green &amp; Amber)</li> </ul>
<ul style="list-style-type: none"> <li>Restore CD</li> </ul>		

Serviceability Features of Chassis		
<ul style="list-style-type: none"> <li>Dual Color Power and HD LED – To Indicate Normal Operations and Fault Conditions</li> </ul>	<ul style="list-style-type: none"> <li>Color coordinated cables and connectors</li> </ul>	<ul style="list-style-type: none"> <li>Tool-less Hood Removal</li> </ul>
<ul style="list-style-type: none"> <li>Front power switch</li> </ul>	<ul style="list-style-type: none"> <li>System memory can be upgraded without removing the system board or any internal components</li> </ul>	<ul style="list-style-type: none"> <li>Tool-less Hard Drive, CD &amp; Diskette Removal</li> </ul>
<ul style="list-style-type: none"> <li>Green Pull Tabs, and Quick Release Latches for easy Identification</li> </ul>		<ul style="list-style-type: none"> <li>Tool-less System Board Removal</li> </ul>

**NOTE:** Thumb screw release mechanism is used with the Ultra-slim Desktop chassis cover.

Feature	Description
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments
Towerable	Product can be oriented as a tower (in addition to desktop orientation)
Drive Self Tests (DPS)	<ul style="list-style-type: none"> <li>Drive Protection System</li> <li>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.</li> <li>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.</li> <li>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</li> </ul>
DPS Access through F10 Setup during Boot	



### Technical Specifications

SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted
SMART I – Drive Failure Prediction	<ul style="list-style-type: none"><li>• Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count</li><li>• By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure</li></ul>
SMART II – Off-Line Data Collection	
SMART III – Off-Line Read Scanning with Defect Reallocation	

### Technical Specifications - Audio

<b>High Definition Audio</b>	<b>Type</b>	Integrated
	<b>High Definition Stereo Codec</b>	Yes – Realtek ALC 260
	<b>Audio Jacks</b>	Microphone-In (64-K ohm Input Impedance); front and rear stereo analog microphone ports available except for USDT, which has front stereo microphone only Line-In (64-K ohm Input Impedance) Line-Out * (200 ohms Output Impedance, expects at least a 10-K ohm load) Headphone-Out (1 Ohm Output Impedance, expects at least a 32 ohm load)
	<b>NOTE:</b> *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.	
	<b>Sampling</b>	8 kHz – 192 kHz
	<b>Wavetable Syntheses (software)</b>	Yes – Uses OS soft wavetable
	<b>Analog Audio</b>	Yes
	<b>Number of Channels on Line-Out (mono/stereo)</b>	Stereo (Left & Right channels)
	<b>Internal Audio Speaker Power Rating</b>	1.5 W
	<b>Internal Speaker</b>	Yes
	<b>External Speaker Jack (Line-Out)</b>	Yes

### Technical Specifications - Communications

<b>Integrated Broadcom NetXtreme Gigabit Ethernet</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Broadcom 5752 PCI-Express LAN Controller
	<b>Memory</b>	Integrated 96Kb frame buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI-E
	<b>Data path width</b>	Single channel, PCI-E
	<b>Data transfer mode</b>	Bus-master DMA
	<b>Hardware certifications</b>	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	<b>Power requirement</b>	3.1 watts @ +3.3V AUX supply with 5V tolerance
	<b>Boot ROM support</b>	Yes
	<b>Network transfer mode</b>	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	<b>Network transfer rate</b>	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
	<b>Environmental</b>	<b>Operating temperature</b> 32° to 131°F (0° to 55° C) <b>Operating humidity</b> 85% at 131° F (55° C)
	<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
	<b>Alerting</b>	N/A

<b>Intel PRO/1000 GT Gigabit PCI NIC</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Intel 82541PI Gigabit Controller
	<b>Memory</b>	Integrated 64KB configurable transmit receive buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI 2.3
	<b>Data path width</b>	32-bit, 33/66 MHz bus interface
	<b>Data transfer mode</b>	Bus-master DMA
	<b>Hardware certifications</b>	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	<b>Power requirement</b>	(800mA) 4watts @ +5VDC
	<b>Boot ROM support</b>	Yes

### Technical Specifications - Communications

<b>Network transfer rate</b>	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)
<b>Environmental</b>	<b>Operating temperature</b> 32° to 131°F (0° to 55° C) <b>Operating humidity</b> 85% at 131° F (55° C)
<b>Dimensions</b>	6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm)
<b>Management capabilities</b>	ACPIWOL and DMI 2.0, S5 WOL, WMI, PXE 2.0, RPL

<b>HP Wireless A+G PCI</b>	<b>Dimensions</b> 4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm)
	<b>Weight</b> 0.268 lb (65 g)
	<b>Controller</b> Atheros AR5414X chipset
	<b>system interface</b> PCI Spec 2.2
	<b>Network standard</b> IEEE 802.11a/b/g
	<b>Frequency band</b> 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)
	<b>Operating temperature</b> 32° to 140° F (0° to 60° C), operating
	<b>Storage temperature</b> -4° to 176° F (-20° to 80° C), non-operating
	<b>Humidity</b> 10% to 85% non-condensing
	<b>Operating voltage</b> 5V ± 5%
	<b>Power consumption</b> Tx/Rx peak 560/250mA @ 3.3V (max.)
	<b>Output power</b> 15 dBm ±2dB (approximately)
	<b>Receive sensitivity</b> -90dBm at 11 Mbps (typical)
	<b>Data transfer rate</b> Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps
	<b>Spreading</b> DSSS (Direct Sequence Spread Spectrum)
	<b>Security</b> 64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP,TKIP, WEP.
	<b>Antenna</b> External 5dBi antenna
	<b>Throughput</b> 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
	<b>Certifications</b> Wi-Fi certified

### Technical Specifications - Communications

<b>Certifications for use by country</b>	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
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#### 2006 Agere PCI 56K International SoftModem

<b>Data Transmission</b>	Technology speeds: 56,000 Kbps maximum downstream data, controllerless
	<b>NOTE:</b> 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.
<b>Data Speeds</b>	(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
<b>Data Standards</b>	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
<b>Fax Speeds</b>	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
<b>Fax Mode Capabilities</b>	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
<b>Error Correction and Data Compression</b>	V.44, 42bis, V.42 and MNP2-5
<b>Power Management</b>	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
<b>Upgradeability</b>	Driver upgradeable for future enhancements
<b>Video</b>	ITU-T V.80 video ready interface
<b>Other</b>	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
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Operating Humidity</b>	20% to 90%, non-condensing
<b>Power</b>	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
<b>Chipset</b>	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
<b>Dimensions (L X H)</b>	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
<b>Connection</b>	Single RJ-11 connector
<b>Other Features</b>	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
<b>Safety</b>	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
<b>EMC</b>	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8

### *Technical Specifications - Communications*

<b>Telecom</b>	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
<b>Health</b>	Bare PCB material compliant to 94V-0 or better (marked as such)
<b>Other</b>	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

### Technical Specifications - Graphics

<b>Integrated Graphics Media Accelerator 950</b>	<b>3D/2D Controller</b>	Microsoft DirectX® 9 based with support for Pixel Shader 2.0, 4:1 anisotropic filtering, Gaussian texture filtering, shadow maps, volumetric textures, double-sided stencil buffers, and 4 pixel pipes.
	<b>VGA Controller</b>	Integrated
	<b>Bus Type</b>	PCI Express™ x16 (Internal graphics is automatically disabled if an external PCIE or PCI graphics card is installed. If the external graphics card is installed in a PCI slot, the internal graphics can be re-enabled using the system's BIOS setup utility. If the external graphics card is installed in the PCI Express™ slot, the internal graphics cannot be enabled).
	<b>RAMDAC</b>	Integrated, 400 MHz
	<b>Memory</b>	Graphics memory is shared with system memory. Graphics memory usage can vary from 8-128 MB depending on the amount of system memory installed and system load. 8 MB is pre-allocated for graphics use at system boot time. Additional memory is allocated for graphics using Intel's Dynamic Video Memory Technology (DVMT) to balance the optimum amount of memory between graphics and other system use. Memory < 256 MB: 8 MB pre-allocated (for DOS) + 24 MB DVMT : max frame buffer of 32 MB 256 MB <= Memory: 8 MB pre-allocated + 120 MB DVMT : max frame buffer of 128 MB
	<b>Controller Clock Speed</b>	400 MHz
	<b>Overlay Planes</b>	Single overlay support with 5x3 filtering
	<b>Maximum Color Depth</b>	32 bits/pixel
	<b>Maximum Vertical Refresh Rate</b>	85 Hz at up to 1920x1440, 85Hz at 2048x1536. Varies with mode and configuration. See table below.
	<b>Multi-display Support</b>	Support for one CRT via the motherboard's VGA connector. Support for an additional DVI-D display via the optional DVI ADD2 card. Dual independent displays and dual synchronous (Twin or Clone mode) displays are supported.
	<b>Graphics/Video API Support</b>	Microsoft DirectX®9, DirectXVA®, VMR9, GDI/GDI+; OpenGL® 1.4.

Resolutions Supported <sup>1</sup>	Resolution	Maximum Refresh Rate (Hz)	
		Analog Monitor	Digital Monitor
	640 x 480	85	60
	800 x 600	85	60
	1024 x 768	85	60
	1280 x 1024	85	60
	1600 x 1200	85	60
	1920 x 1080	85	60
	1920 x 1200	85	60
	1920 x 1440	85	60
	2048 x 1536	85	60

<sup>1</sup> Modes 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.

### Technical Specifications - Graphics

<b>DVI ADD2 Graphics</b>	<b>Models</b>	DY674A Intel DVI ADD2 adapter for Convertible Minitower and Small Form Factor
	<b>Form Factor</b>	Low-profile card
	<b>DVI-D Connector</b>	Compliant with DDWG (Digital Display Working Group) and VESA specifications for a single-link digital DVI (DVI-D) connector.
	<b>Dual Head Support</b>	Yes, when used with the integrated VGA connector
	<b>Display Devices Supported</b>	HP L1530 HP L1740 HP L1755 HP L1940 HP L1955 HP L2035 HP L2335

**NOTE:** The DVI ADD2 card offers optimal performance with any display that meets applicable VESA standards.

<b>Color Depth</b>	All modes support 8-bpp, 16-bpp, and 24-bpp color depths
<b>Host Interface Connector</b>	Mechanically compliant with PCI-E standard Complies with the Intel ADD2 and Intel Serial Digital Video Output (SDVO) specifications
<b>Dot Clock</b>	165 MHz maximum
<b>Display Modes</b>	Supports display modes that require up to 165-MHz bandwidth on the link, as shown in the following table.

<b>Resolution</b>		<b>60-Hz LCD</b>	<b>60-Hz</b>	<b>75-Hz</b>	<b>85-Hz</b>
Blanking		5% reduced	GTF	GTF	GTF
640 x 480	VGA	Yes	Yes	Yes	Yes
800 x 600	SVGA	Yes	Yes	Yes	Yes
1024 x 768	XGA	Yes	Yes	Yes	Yes
1280 x 1024	SXGA	Yes	Yes	No	No
1600 x 1200	UXGA	Yes	Yes	No	No

<b>ATI RADEON X300 SE PCI Express (PCIe x16) Graphics</b>	<b>Models</b>	ATI RADEON X300 SE PCI Express 128-MB DDR single head DVI with TV out
	<b>Bus Type</b>	PCI Express (x16 lanes)
	<b>Maximum Vertical Refresh Rate</b>	85 Hz
	<b>Display Support</b>	Integrated 400MHz RAMDAC
	<b>Display Max Resolution</b>	2048 x 1536
	<b>Board Display Options</b>	<b>128 MB Card Display Option</b> 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 7-pin mini-DIN (also allowing 4-pin S-Video without adaptor)



### Technical Specifications - Graphics

<b>Board Configuration</b>	<b>Specification</b>	<b>Description</b>
128 MB Frame Buffer	Graphics Chip	RADEON X300 SE PCI Express
	Core clock	200 MHz
	Memory clock	200 MHz
	Frame buffer	128 MB DDR
	Memory I/O	64 bit
	Memory Configuration	4 pcs 16M x 16 DDR
<b>Memory Type</b>	DDR1	
<b>Maximum Memory</b>	128MB	
<b>Core Power</b>	10 W (Max ASIC power) 18 W (Max Board power)	
<b>Option Kit Contents</b>	ATI RADEON X300 SE PCI Express graphics card with full height bracket attached Low profile bracket Software CD with graphics drivers Warranty documentation	

### ATI RADEON X1300 PCIe Graphics Card (256 MB)

<b>Bus Type</b>	PCI Express (x16 lanes)	
<b>Maximum Vertical Refresh Rate</b>	85 Hz	
<b>Display Support</b>	Integrated 400MHz RAMDAC	
<b>Display Max Resolution</b>	2048 x 1536	
<b>Board Display Options</b>	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	
<b>Board Configuration</b>	<b>Specification</b>	<b>Description</b>
128 MB Frame Buffer	Graphics Chip	RV515
	Core clock	450 MHz
	Memory clock	250 MHz
	Frame buffer	256 MB DDR2
<b>Languages supported</b>	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	
<b>Core Power</b>	25 W (Max board power)	
<b>Option kit contents</b>	<ul style="list-style-type: none"> <li>• ATI RADEON X1300 PCIe graphics card with full height bracket attached</li> <li>• Low profile bracket</li> <li>• DVI-to-VGA Adapter</li> <li>• Software CD with graphics drivers</li> <li>• Warranty documentation</li> </ul>	

### 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

#### **EMC Immunity:**

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

#### **Safety:**

UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements.

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<b>ATI RADEON X1600XT (256 MB DH) FH PCIe Graphics Card</b>	<b>Bus Type</b>	PCI Express (x16 lanes)	
	<b>Maximum Vertical Refresh Rate</b>	85 Hz	
	<b>Display Support</b>	Integrated 400 MHz RAMDAC	
	<b>Display Max Resolution</b>	2560 x 1600 digital, 2048 x 1536 analog	
	<b>Board Display Options</b>	2 DVI-I ports (one port supports dual link DVI). DVI-I supports an analog CRT or flat panel with a VGA connector via the provided DVI-I to VGA adapter 4-pin mini-DIN S-video connector for TV output	
	<b>Board Configuration</b>	<b>Specification</b>	<b>Description</b>
		Graphics chip	RV530
		Core clock	590 MHz
		Memory clock	690 MHz
		Frame buffer	256 MB GDDR3, 128 bit wide
<b>Core Power</b>	56 W (Max board power)		

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### Technical Specifications - Graphics

<b>NVIDIA Quadro NVS 285 128-MB PCIe Dual Head</b>	<b>Form Factor</b>	Low profile, both ATX and low profile brackets included
	<b>Graphics Controller</b>	Integrated Quadro 285 2D graphics processor unit (GPU)
	<b>Bus Type</b>	PCI-Express
	<b>Memory</b>	128 MB DDR (64 MB local frame buffer plus 64 MB of system memory via TurboCache)
	<b>Connector</b>	DMS-59 to dual-DVI Y-cable or dual-VGA Y-cable
	<b>Dimensions</b>	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	<b>Multi-monitor Support</b>	Dual analog or digital monitors
	<b>RAMDAC</b>	Dual 350 MHz (integrated)
	<b>Maximum Pixel Clock</b>	350 MHz
	<b>Overlay Planes</b>	One 16-bit Video overlay plane
	<b>High-definition Video Processor (HDVP)</b>	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
	<b>Available Graphics Drivers</b>	Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode) HP qualified drivers may be preloaded or available from the HP support Web site:

<http://www.hp.com/country/us/en/support.html?pageDisplay=drivers>

#### Analog Resolution

640 x 480  
800 x 600  
1024 x 768  
1152 x 864  
1280 x 1024  
1600 x 1200  
1920 x 1080  
1920 x 1200  
1920 x 1440  
2048 x 1536

#### Maximum Refresh Rate

240 Hz  
240 Hz  
240 Hz  
170 Hz  
150 Hz  
100 Hz  
85 Hz  
85 Hz  
75 Hz  
60 Hz

#### Digital Resolution

640 x 480  
800 x 600  
1024 x 768  
1152 x 864  
1280 x 1024  
1600 x 1200  
1900 x 1200

#### Maximum Refresh Rate

75 Hz  
75 Hz  
75 Hz  
60 Hz  
60 Hz  
60 Hz  
60 Hz

### Technical Specifications - Graphics

<b>NVIDIA Quadro NVS 280 64MB PCI Dual Head</b>	<b>Form Factor</b>	Low profile (both ATX and low profile brackets included)
	<b>Graphic Controller</b>	Integrated Quadro 280 2-D graphics processor unit (GPU)
	<b>Bus type</b>	PCI
	<b>RAMDAC</b>	Dual 350 MHz integrated
	<b>Memory</b>	64 MB DDR with frame buffer and Texture storage
	<b>Connector</b>	Single High-density DMS-59 Connector
	<b>Dimensions</b>	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	<b>Controller clock speed</b>	250 MHz
	<b>Color depth</b>	32-bits/pixel max
	<b>Overlay planes</b>	One 16-bit Video overlay plane
	<b>Maximum vertical refresh rate</b>	85 Hz
	<b>Multi-monitor support</b>	Dual analog or digital monitors
	<b>Dual DVI Support</b>	Yes (with kit DL139A)
	<b>High-definition Video Processor (HDVP)</b>	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
	<b>Available graphics drivers</b>	Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode)

**NOTE:** HP qualified drivers may be preloaded or available from the HP support Web site: [http://welcome.hp.com/country/us/eng/software\\_drivers.html](http://welcome.hp.com/country/us/eng/software_drivers.html).

<b>Analog Resolution</b>	<b>Maximum Refresh Rate</b>
640 x 480	240 Hz
800 x 600	240 Hz
1024 x 768	200 Hz
1600 x 1200	170 Hz
1600 x 1200	150 Hz
1600 x 1200	100 Hz
1920 x 1200	85 Hz
1920 x 1200	85 Hz
1920 x 1440	75 Hz
2048 x 1536	60 Hz
<b>Digital Resolution</b>	<b>Maximum Refresh Rate</b>
640 x 480	75 Hz
800 x 600	75 Hz
1024 x 768	75 Hz
1152 x 864	60 Hz
1280 x 1024	60 Hz
1600 x 1200	60 Hz (primary only)

### Technical Specifications - Graphics

<b>NVIDIA Quadro NVS 55</b>	<b>Form Factor</b>	Low profile, both ATX and low profile brackets included
<b>64MB PCI DVI with TV-Out</b>	<b>Graphic Controller</b>	Integrated Quadro NVS 55 Graphics Processor Unit (GPU)
	<b>Bus type</b>	PCI 2.1, 32-bit, 5V
	<b>Memory</b>	64 MB DDR
	<b>Connectors</b>	Single DVI-I connector Single S-Video connector
	<b>Dimensions</b>	Low profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	<b>Controller clock speed</b>	250 MHz
	<b>Memory speed</b>	200 MHz
	<b>Color depth</b>	32-bits/pixel max
	<b>Overlay planes</b>	One 16 bit video overlay plane
	<b>Maximum vertical refresh rate</b>	85 Hz
	<b>Maximum pixel clock</b>	Analog output: 350 MHz Digital output: 162 MHz
	<b>Single DVI Support</b>	Yes
	<b>TV out support</b>	Yes (S-Video 4 pin mini-Din)
	<b>High-definition Video Processor (HDVP)</b>	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 colorspace conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation Up to 5-tap horizontal by 3-tap vertical filtering
	<b>Agency Approvals</b>	ACA C-tick, BSMI, CE Mark, FCC, ICES/C.I.S.P.R, MIC, UL, VCCI
	<b>Available graphics drivers</b>	Microsoft Windows 2000 and Microsoft Windows XP HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://www.hp.com/country/us/en/support.html?pageDisplay=drivers">http://www.hp.com/country/us/en/support.html?pageDisplay=drivers</a>

### Technical Specifications - Hard Drives

<b>7200 rpm Serial ATA Hard Drives</b>	<b>250-GB</b>	<b>Capacity</b>	250,059,350,016 bytes			
		<b>Height</b>	1 in (2.54 cm)			
		<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)			
		<b>Interface</b>	Serial ATA (3.0 Gb/s)			
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s			
		<b>Buffer</b>	8 MB			
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms		
			<b>Average</b>	8.5 ms		
			<b>Full-Stroke</b>	18 ms		
		<b>Rotational Speed</b>	7,200 rpm			
		<b>Logical Blocks</b>	488,397,168			
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)			
			<b>160-GB</b>	<b>Capacity</b>	163,928,604,672 bytes	
				<b>Height</b>	1 in (2.54 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)					
<b>Interface</b>	Serial ATA (3.0 Gb/s)					
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s					
<b>Buffer</b>	8 MB					
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>			0.9 ms		
	<b>Average</b>			9.3 ms		
	<b>Full-Stroke</b>			18 ms		
<b>Rotational Speed</b>	7,200 rpm					
<b>Logical Blocks</b>	320,173,056					
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)					

### Technical Specifications - Hard Drives

<b>80-GB</b>	<b>Capacity</b>	80,026,361,856 bytes	
	<b>Height</b>	1 in (2.54 cm)	
	<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	<b>Interface</b>	Serial ATA (3.0 Gb/s)	
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
	<b>Buffer</b>	8 MB	
	<b>Seek Time (typical reads, includes controller overhead, including settling)</b>	<b>Single Track</b> 2.0 ms <b>Average</b> 9.3 ms <b>Full-Stroke</b> 21 ms	
	<b>Rotational Speed</b>	7,200 rpm	
	<b>Logical Blocks</b>	156,301,488	
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
	<b>40-GB</b>	<b>Capacity</b>	40,020,000,000 bytes
		<b>Height</b>	1 inch (2.54 mm)
		<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
<b>Interface</b>		Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>		Up to 1.5 Gb/s	
<b>Buffer</b>		2 MB	
<b>Seek Time (typical reads, includes controller overhead, including settling)</b>		<b>Single Track</b> 1.0 ms <b>Average</b> 8.5 ms <b>Full-Stroke</b> 18.0 ms	
<b>Rotational Speed</b>		7,200 rpm	
<b>Logical Blocks</b>		78,165,360	
<b>Operating Temperature</b>		41° to 131° F (5° to 55° C)	

### Technical Specifications - Input/Output Devices

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



### Technical Specifications - Input/Output Devices

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

<b>HP USB Smartcard Keyboard</b>	<b>Physical characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)
		<b>Form factor</b>	USB basic Smart Card keyboard
		<b>Colors</b>	Carbonite/Silver
		<b>Dimensions (H x W x D)</b>	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)

### Technical Specifications - Input/Output Devices

<b>Electrical</b>	<b>Weight</b>	2 lb (0.9 kg) minimum
	<b>Operating voltage</b>	+ 5VDC $\pm$ 5%
	<b>Power consumption</b>	100-mA maximum (with four LEDs ON)
	<b>System interface</b>	USB Type A plug connector
	<b>ESD</b>	CE level 4, 15-kV air discharge
	<b>EMI – RFI</b>	Conforms to FCC rules for a Class B computing device
<b>Mechanical</b>	<b>Microsoft PC 99 – 2001</b>	Functionally compliant
	<b>Languages</b>	30+ available
	<b>Keycaps</b>	Low-profile design
	<b>Switch actuation</b>	55 g nominal peak force with tactile feedback
	<b>Switch life</b>	20 million keystrokes (using Hasco modified tester)
	<b>Switch type</b>	Contamination-resistant membrane
	<b>Key-leveling mechanisms</b>	For all double-wide and greater-length keys
	<b>Cable length</b>	6 ft (1.8 m)
<b>Environmental</b>	<b>Microsoft PC 99 - 2001</b>	Mechanically compliant
	<b>Acoustics</b>	43-dBA maximum sound pressure level
	<b>Operating temperature</b>	50° to 122° F (10° to 50° C)
	<b>Non-operating temperature</b>	-22° to 140° F (-30° to 60° C)
	<b>Operating humidity</b>	10% to 90% (non-condensing at ambient)
	<b>Non-operating humidity</b>	20% to 80% (non-condensing at ambient)
	<b>Operating shock</b>	40 g, six surfaces
	<b>Non-operating shock</b>	80 g, six surfaces
	<b>Operating vibration</b>	2-g peak acceleration
	<b>Non-operating vibration</b>	4-g peak acceleration
	<b>Drop (out of box)</b>	26 in (66 cm) on carpet, six-drop sequence
<b>Drop (in box)</b>	42 in (107 cm) on concrete, 16-drop sequence	

### Technical Specifications - Input/Output Devices

<b>SMARTCARD function</b>	<b>Support</b>	All ISO 7816 smart cards	
	<b>Interface</b>	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)	
	<b>Chipset</b>	SCM STCII	
	<b>Standard APIs supported</b>	PC/SC, EMV2000, SET	
	<b>Power</b>	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	
	<b>Power consumption</b>	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)	
	<b>Communication</b>	<b>From card</b>	Programmable from 9,600 baud to 115,200 baud
		<b>From computer</b>	Up to 38,400 baud
	<b>Landing mechanism</b>	<b>Contact device</b>	Friction contact
		<b>Card insertions rating</b>	Up to 100,000 insertion cycles
	<b>Interface modes</b>	USB communications through USB port SCM protocol Automatic card insertion/removal detection	
	<b>Reader performance interface</b>	USB connection	
	<b>Electro-magnetic standards</b>	<b>Europe</b>	89/336/CEE guideline
		<b>USA</b>	USAFCC part 15

<b>HP PS/2 Scroll Mouse</b>	<b>Dimensions</b>	3.8 x 6.3 x 11.6 cm (1.5 x 2.5 x 4.6 in)	
	<b>Weight</b>	4.44 oz (126 g)	
	<b>Environmental</b>	<b>Operating temperature</b>	50° to 122° F (10° to 50° C)
		<b>Non-operating temperature</b>	22° to 140° F (-30° to 60° C)
		<b>Operating humidity</b>	10% to 90% (non condensing at ambient)
		<b>Non-operating humidity</b>	20% to 80% (non condensing at ambient)
		<b>Operating shock</b>	40 g, 6 surfaces
		<b>Non-operating shock</b>	80 g, 6 surfaces
		<b>Operating vibration</b>	2 g peak acceleration
		<b>Non-operating vibration</b>	4 g peak acceleration
		<b>Drop (out of box)</b>	26 in (66 cm) on carpet, 6-drop sequence
		<b>Drop (out of box)</b>	1 m on asphalt tile over concrete, 6-drop sequence

### Technical Specifications - Input/Output Devices

<b>Electrical</b>	<b>Operating voltage</b>	5 VDC $\pm$ 10%	
	<b>Power consumption</b>	15 mA	
	<b>System consumption</b>	PS/2 mini-din connector	
	<b>ESD</b>	CE level 4, 15 kV air discharge	
	<b>EMI-RFI</b>	Conforms to FCC rules for a Class B computing device	
<b>Mechanical</b>	<b>Microsoft® PC99 - 2001</b>	Functionally compliant	
	<b>Resolution</b>	400 $\pm$ 20% DPI	
	<b>Tracking speed</b>	10 in/s (25.4 cm/s) maximum	
	<b>Acceleration</b>	100 in/s/s (2.54 m/s/s)	
	<b>Switch actuation</b>	65 g nominal peak force	
	<b>Switch life</b>	1,000,000 operations (using Hasco modified tester)	
	<b>Switch type</b>	Low force micro-switches	
	<b>Tracking mechanism life</b>	155 mi (250 km) at average speed of 10 in/s	
	<b>Cable length</b>	6 ft (1.8 m)	
	<b>Microsoft PC99 - 2001</b>	Mechanically compliant	
	<b>Scroll wheel</b>	<b>Width</b>	8 mm
		<b>Diameter</b>	.99 in (25.2 mm)
		<b>Maximum rotation speed</b>	30 mm/s
<b>Switch type</b>		Light force micro-switch	
<b>Switch life</b>		1 million operations	
<b>Regulatory approvals</b>	<b>Mechanical life</b>	Minimum 200,000 revolutions	
	<b>Compliant</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	

<b>HP PS/2 Optical Scroll Mouse</b>	<b>Dimensions (H x L x W)</b>	3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in)
	<b>Weight</b>	4.44 oz (126 g)
<b>Environmental</b>	<b>Operating temperature</b>	-32° to 104°F (0° to 40° C)
	<b>Non-operating temperature</b>	-4° to 140°F (-20° to 60° C)
	<b>Operating humidity</b>	10% to 90% (non condensing at ambient)
	<b>Non-operating humidity</b>	10% to 90% non condensing
	<b>Operating shock</b>	40 g, 6 surfaces
	<b>Non-operating shock</b>	80 g, 6 surfaces
	<b>Operating vibration</b>	2 g peak acceleration
	<b>Non-operating vibration</b>	4 g peak acceleration
	<b>Drop (out of box)</b>	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face

### Technical Specifications - Input/Output Devices

<b>Electrical</b>	<b>Operating voltage</b>	5 VDC ± 10%
	<b>Power consumption</b>	100mA
	<b>System consumption</b>	PS/2 mini-din connector
	<b>ESD</b>	CE level 4, 15 kV air discharge
	<b>EMI-RFI</b>	Conforms to FCC rules for a Class B computing device
<b>Mechanical</b>	<b>Microsoft PC99 – 2001</b>	Functionally compliant
	<b>Resolution</b>	400 ± 20% DPI
	<b>Tracking speed</b>	10 in/s (25.4 cm/s) maximum
	<b>Acceleration</b>	100 in/s/s (2.54 m/s/s)
	<b>Switch actuation</b>	61 g nominal peak force
	<b>Switch life</b>	3,000,000 operations (using Hasco modified tester)
	<b>Switch type</b>	Low force micro-switches
	<b>Tracking mechanism life</b>	155 mi (250 km) at average speed of 10 in/s
	<b>Cable length</b>	6 ft (1.8 m)
	<b>Microsoft PC99 – 2001</b>	Mechanically compliant
<b>Scroll wheel</b>	<b>Width</b>	8 mm
	<b>Diameter</b>	1.01 in (25.6 mm)
	<b>Maximum rotation speed</b>	48 rats/sec
	<b>Switch type</b>	Light force micro-switch
	<b>Switch life</b>	1 million operations
<b>Regulatory approvals</b>	<b>Mechanical life</b>	Minimum 200,000 revolutions
	<b>Compliant</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

<b>HP USB Scroll Mouse</b>	<b>Environmental</b>	<b>Operating temperature</b>	50° to 122° F (10° to 50° C)
		<b>Non-operating temperature</b>	-22° to 140° F (-30° to 60° C)
		<b>Operating humidity</b>	10% to 90% (non condensing at ambient)
		<b>Non-operating humidity</b>	20% to 80% (non condensing at ambient)
		<b>Operating shock</b>	40 g, 6 surfaces
		<b>Non-operating shock</b>	80 g, 6 surfaces
		<b>Operating vibration</b>	2 g peak acceleration
		<b>Non-operating vibration</b>	4 g peak acceleration
		<b>Drop (out of box)</b>	26 in (66 cm) on carpet, 6-drop sequence
		<b>Drop (out of box)</b>	1 m on asphalt tile over concrete, 6-drop sequence

### Technical Specifications - Input/Output Devices

<b>Electrical</b>	<b>Operating voltage</b>	5 VDC $\pm$ 10%
	<b>Power consumption</b>	15 mA
	<b>System consumption</b>	USB Type-A plug connector
	<b>ESD</b>	CE level 4, 15 kV air discharge
	<b>EMI-RFI</b>	Conforms to FCC rules for a Class B computing device
<b>Mechanical</b>	<b>Microsoft® PC99 - 2001</b>	Functionally compliant
	<b>Resolution</b>	400 $\pm$ 20% DPI
	<b>Tracking speed</b>	10 in/s (25.4 cm/s) maximum
	<b>Acceleration</b>	100 in/s/s (2.54 m/s/s)
	<b>Switch actuation</b>	65 g nominal peak force
	<b>Switch life</b>	1,000,000 operations (using Hasco modified tester)
	<b>Switch type</b>	Low force micro-switches
	<b>Tracking mechanism life</b>	155 mi (250 km) at average speed of 10 in/s
	<b>Cable length</b>	6 ft (1.8 m)
	<b>Microsoft PC99 - 2001</b>	Mechanically compliant
<b>Scroll wheel</b>	<b>Width</b>	8 mm
	<b>Maximum rotation speed</b>	30 mm/s
	<b>Switch type</b>	Light force micro-switch
	<b>Switch life</b>	1 million operations
<b>Regulatory approvals</b>	<b>Mechanical life</b>	Minimum 200,000 revolutions
	<b>Compliant</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

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

### Technical Specifications - Optical Storage

<b>16X DVD+/-RW LightScribe Drive</b> (Double Layer / Dual Format)	<b>Height</b>	5.25-inch, half-height, tray-load		
	<b>Orientation</b>	Either horizontal or vertical		
	<b>Interface type</b>	ATAPI/EIDE		
	<b>Disc recording capacity</b>	8.5 GB DL or 4.7 GB standard		
	<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	<b>Weight (max)</b>	2.6 lb (1.2 kg)		
	<b>Write speed</b>	DVD+R	Up to 16X	
		DVD+RW	Up to 4X	
		DVD+R DL	Up to 2.4X	
		DVD-R	Up to 8X	
		DVD-RW	Up to 4X	
		CD-R	Up to 40X	
		CD-RW	Up to 24X	
		<b>Read speed</b>	DVD+R/-R/+RW/ -RW/+R DL	Up to 8X
	DVD-ROM		Up to 16X	
	CD-ROM, CD-R		Up to 40X	
	CD-RW		Up to 32X	
	<b>Access time</b> (typical reads, including settling)		<b>Random</b>	DVD: < 130 ms (typical), CD: < 120 ms (typical)
			<b>Full Stroke</b>	DVD: < 240 ms (seek), CD: < 200 ms (seek)
		<b>Startup Time</b>	Single-session: < 15 seconds (typical), Multi-session: < 30 seconds (typical)	
		<b>Stop Time</b>	< 4 seconds	
	<b>Power</b>	<b>Cache Buffer</b>	2 MB (minimum)	
<b>Data Transfer Modes</b>		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)		
<b>Source</b>		Four-pin, DC power receptacle		
		<b>DC Power Requirement</b>	5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 5%-200 mV ripple p-p	
		<b>DC Current</b>	5 VDC (< 1000 mA typical, 1600 mA maximum) 12 VDC (< 600 mA typical, 1400 mA maximum)	
<b>Audio output</b>		<b>Total Drive Power</b> (standby mode)	< 2.5 Watt	
		<b>Line-Out</b>	0.7 VRMS	
		<b>Signal-to-Noise Ratio</b>	74 dB	
		<b>Channel Separation</b>	65 dB	

### Technical Specifications - Optical Storage

<b>Environmental conditions</b> (operating - non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative humidity</b>	10% to 90%
	<b>Maximum wet bulb temperature</b>	86° F (30° C)
<b>System configuration</b>	Intel Pentium III Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data	
<b>Regulatory approvals</b>	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft PC2001 certification, Microsoft Logo for Windows XP and 2000.	

<b>16X/48X DVD-ROM Drive</b>	<b>Height</b>	5.25-in, half-height		
	<b>Interface Type</b>	ATAPI		
	<b>Dimensions— External, Excluding Bezel (W x H)</b>	5.88 x 1.71 in (149.5 x 43.5 mm)		
	<b>Disc Diameter</b>	12 cm, 8 cm		
	<b>Disc Thickness</b>	1.2 mm		
	<b>Track Pitch</b>	1.6 µm (CD), 0.74 µm (DVD)		
	<b>Disc Center Hole Diameter</b>	15 mm		
	<b>Disc Formats</b>	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R, DVD+R DL ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW		
	<b>Disc Capacity</b>	<b>DVD-ROM</b>	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R), 8.5 GB (DVD+R DL)	
		<b>CD-ROM</b>	540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)	
	<b>Block Size (bytes)</b>	DVD-ROM - 2048; CD-ROM Mode 0 - 2352; CD-ROM Mode 1 - 2352, 2340, 2336, 2048; CD-ROM Mode 2 - 2352, 2340, 2336, 2048		
	<b>Access Times</b> (typical reads, including settling)	<b>DVD-ROM Single Layer</b>	120 ms (typical)	
		<b>CD-ROM Mode 1</b>	90 ms (typical)	
		<b>Full Stroke DVD</b>	240 ms (seek) (typical)	
	<b>Full Stroke CD</b>	160 ms (seek) (typical)		
<b>Maximum Data Transfer Rates</b>	<b>CD-ROM Read</b>	7200 KB/s (up to 48X)		
	<b>DVD-ROM Read</b>	21,600 KB/s (16X) Max		



### Technical Specifications - Optical Storage

<b>Data Transfer Modes</b>	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)	
<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC Power Requirement</b>	5 VDC $\pm$ 5% – 100 mV ripple p-p 12 VDC $\pm$ 5% – 200 mV ripple p-p
	<b>DC Current</b>	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical
<b>Audio Output Level</b>	0.7 Vrms (typical)	
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes	
<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon	
<b>Environmental</b> (all conditions non-condensing)	<b>Temperature (operating)</b>	41° to 122° F (5° to 50° C)
	<b>Relative Humidity (operating)</b>	10% to 85%
	<b>Maximum Wet Bulb Temperature (operating)</b>	86° F (30° C)
	<b>Certifications, Approvals</b>	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000.

#### 48X/32X Combo CD-RW/DVD-ROM Drive

<b>Orientation</b>	Either horizontal or vertical
<b>Disc Loading Mechanism</b>	Half-height, tray load
<b>Interface Type</b>	ATAPI
<b>Dimensions—external (W x H x D)</b>	5.77 x 1.71 x 7.36 in (14.66 x 4.34 x 18.69 cm) (external, excluding bezel)
<b>Disc Diameter</b>	12 cm, 8 cm
<b>Disc Thickness</b>	0.05 in (1.2 mm)
<b>Track Pitch</b>	1.6 $\mu$ m (CD), 0.74 $\mu$ m (DVD)
<b>Disc Center Hole Diameter</b>	0.6 in (15 mm)
<b>Reference Scanning Velocity</b>	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)

### Technical Specifications - Optical Storage

<b>Read Only Disc Parameters</b>	<b>Formats and Modes Supported</b>	CD-ROM-Mode 1; CD-ROM XA-Mode 2; CD-Bridge; CD digital audio; CD Extra; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session , and DVD+RW
	<b>Capacity</b>	180 MB (8 cm); 540 MB (12 cm); 650 MB (12 cm); 700 MB (12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10)
	<b>Block Size</b>	Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 bytes; DVD-2,048 bytes
<b>Writeable Disc Parameters</b>	<b>Disc Type</b>	CD-R and CD-RW
	<b>Write Methods</b>	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	<b>Format and Modes Supported</b>	CD-ROM; CD-ROM XA; CD digital audio, video CD; CD-Bridge
	<b>Capacity</b>	180 MB (8 cm); 540 MB (12 cm); 650 MB (12 cm); 700 MB (12 cm)
	<b>Block Size</b>	CD-DA-2,352 bytes; mode 0- 2,336 and 2,352 bytes; mode 1-2,048 and 2,352 bytes; mode 2-2,336 and 2,352; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,324 and 2,352 bytes
<b>Access Times (typical)</b>	<b>Random DVD</b>	< 140 ms (typical)
	<b>Random CD</b>	< 125 ms (typical)
	<b>Full Stroke DVD</b>	< 250 ms (seek)
	<b>Full Stroke CD</b>	< 210 ms
<b>Data Transfer Rates</b>	<b>CD-R write</b>	7200 KB/s (48X) Max
	<b>CD-RW write</b>	4800 KB/s (32X) Max
	<b>CD-ROM, CD-R, CD-RW read</b>	7200 KB/s (32X) Max
	<b>DVD ROM read</b>	21,632 KB/s (16X) Max
<b>Data Transfer Modes</b>	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)	
<b>Cache Buffer</b>	2 MB (minimum)	
<b>Start-up Time (single)</b>	< 7 seconds typical	
<b>Start-up Time (multi-session)</b>	< 30 seconds typical	
<b>Stop Time</b>	< 4 seconds	

### Technical Specifications - Optical Storage

<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC power requirement</b>	5 VDC $\pm$ 5%—100 mV ripple p-p 12 VDC $\pm$ 5%—200 mV ripple p-p
	<b>DC current</b>	5 VCD < 1A (typical) < 1600 mA (maximum)
		12 VCD < 600 mA (typical) < 1.4A (maximum)
		Total Drive Power (Standby mode) < 2.5 watt
<b>Audio Output Level</b>		0.7 Vrms
<b>Configuration Jumper Block</b>		Cable select (default), master and slave modes
<b>Data Interface Connector</b>		40-pin, shrouded and keyed, flat ribbon
<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature</b> (operating)	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b> (operating)	10% to 90%
	<b>Maximum Wet Bulb Temperature</b> (operating)	86° F (30° C)
<b>Certifications, Requirements</b>		MPC-3 compliant, multi-read requirements, ACA AS/NZS 3548, ANSI C63.4-1992, ATAPI Spec SFF-8020, ATA Spec X3T9.2, CB Bulletin No. 92A, CSA C22.2 No. 950-1995, C.I.S.P.R. Pub 22, EMKO-TSE 207/94, TUV or VDE EN60 950, EN60825-1, Microsoft ©PC2001 certification, Microsoft Logo for Windows XP, 2000

<b>48X/32X/48X CD-RW Drive</b>	<b>Orientation</b>	Either horizontal or vertical
	<b>Disc loading mechanism</b>	Half-height, tray load
	<b>Interface type</b>	ATAPI IDE
	<b>Dimensions-external</b> (W x H x D)	7.99 x 5.88 x 1.71 in (20.3 x 14.93 x 4.34 cm)
	<b>Weight</b>	2.6 lb (1.2 kg)
	<b>Disc diameter</b>	12 cm, 8 cm
	<b>Disc thickness</b>	1.2 mm
	<b>Track pitch</b>	1.6 $\mu$ m
	<b>Disc center hole diameter</b>	15 mm
	<b>Reference scanning velocity</b>	1.2 m/s
	<b>Recording/playing time</b>	80 minutes with CD-R media

### Technical Specifications - Optical Storage

<b>Read only disc parameters</b>	<b>Formats and modes supported</b>	CD-ROM-Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I-Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD
	<b>Capacity</b>	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
	<b>Block size</b>	Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 and 2,368 bytes
	<b>Disc type</b>	CD-R and CD-RW
<b>Writeable disc parameters</b>	<b>Write methods</b>	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	<b>Format and modes supported</b>	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD
	<b>Capacity</b>	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
	<b>Block size</b>	Mode 1-2,048 bytes; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,352 bytes; CD-DA ---2,352 bytes
	<b>Access times (typical)</b>	<b>Random</b> < 120 ms <b>Full stroke</b> < 200 ms
<b>Data transfer rates</b>	<b>CD-RW write</b>	4800 KB/s (up to 32X)
	<b>CD-ROM, CD-R read</b>	7200 KB/s (up to 48X)
	<b>CD-RW read</b>	7200 KB/s (up to 32X)
	<b>CD-R write</b>	7200 KB/s (up to 48X)
<b>Data transfer modes</b>	ATA PIO mode 4 (16.7MB/s); ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s) ;ATA UltraDMA mode 1 (24 MB/s) ; ATA UltraDMA mode 2 (33 MB/s) - default.	
<b>Cache buffer</b>	2 MB (minimum)	
<b>Start-up time (single)</b>	< 7 seconds typical	
<b>Start-up time (multi-session)</b>	< 30 seconds typical	
<b>Stop time</b>	< 4 seconds	

### Technical Specifications - Optical Storage

<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC power requirement</b>	5 VDC 5%-100 mV ripple p-p 12 VDC 5%-200 mV ripple p-p
	<b>DC current</b>	5 VCD < 1A (typical) < 1600 mA (maximum) 12 VCD < 600 mA (typical) < 1.4A (maximum) Total Drive Power (Standby mode) < 2.5 watt
<b>Audio output level</b>	0.7 Vrms	
<b>Configuration jumper block</b>	Master, slave and cable select modes	
<b>Data interface connector</b>	50-pin IDE interface	
<b>Environmental</b> (all conditions, non-condensing)	<b>Temperature</b> (operating)	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b> (operating)	10% to 90%
	<b>Maximum Wet Bulb Temperature</b> (operating)	84° F (29° C)
<b>Certifications, requirements</b>	ACA AS/NZS 3548, ANSI C63.4-1992, CB Test Certificate for IEC 950, CE Mark, CFR 47 part 15, CNS 13438, CSA C22.2 No. 60950, DHHS/FDA - 1040, EN60825, EN55022:1998, EN55024, EN60950:2000, ICES-003 class B, IEC 61000 4-2 - 4-11, Nordic EN60950, TUV or VDE EN60950, UL 60950, C.I.S.P.R. Publication 22 Class B, BSMI, Microsoft P2001, Microsoft Logo for Windows98, 2000 and XP	

<b>48X Max CD-ROM Drive Interface</b>	ATAPI	
<b>Data Transfer Rate</b>	Variable (Audio CD) - 1,800 to 3,600 KB/s (24X) Max	Variable (CD-ROM, CD-R)-2,400 to 7,200 KB/s (48X) Max
<b>Access Time</b> (ms)	Random: <125 ms	Full-stroke seek: <210 ms
<b>Data Buffer</b>	2MB	
<b>Disk Formats Read</b>	CD-ROM Mode 1, CD-ROM XA (Mode 2, Form 1 and 2), CD Digital Audio, CD-EXTRA, CD-I (Mode 2, Form 1 and 2) and CD-I Ready, CD-Text, CD-Bridge, Photo CD (Single and Multi Session), Video CD, CD-R and CD-RW Multi-Session	
<b>Disk Formats Written</b>	None	
<b>Disk Capacity</b> (CD)	180MB, 540MB, 650 MB, and 700MB	
<b>Block Size</b>	Mode 1-2,048, 2,352 bytes Mode 2-1, 2,048, 2,328, 2,336, 2,340, 2,353 bytes Mode 2-2, 2,328, 2,336, 2,340, 2,352 bytes CD-DA-2,352, 2,368 bytes	
<b>Diameter</b>	12 cm; 8 cm	
<b>Thickness</b>	1.2 mm	
<b>Track Pitch</b>	1.6 µm	
<b>Audio Output Level</b>	Line-out-0.7 V @ 47 Kohm	

### *Technical Specifications - Optical Storage*

<b>Startup Time</b>	<7 seconds (typical); < 30 seconds with multi-session	
<b>Operating Conditions</b>	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b>	10% to 90%
<b>Dimensions</b> (H x W x D, maximum)	1.7 x 5.9 x 8.0 in (4.3 x 15.0 x 20.3 cm)	
<b>Weight</b>	2.6 lb (1200 g)	

### Technical Specifications - Removable Storage

<b>HP 16-in-1 Media Card Reader</b>	<b>USB Interface</b>	USB 2.0 High-speed device
	<b>Advance protocol support</b>	Supports hardware ECC (Error Correction Code) function <ul style="list-style-type: none"><li>• Supports hardware CRC (Cyclic Redundancy Check) function</li><li>• Supports MS 4-bit parallel transfer mode</li><li>• Supports MS-PRO 4-bit parallel transfer mode</li><li>• Supports SD 4-bit parallel transfer mode</li><li>• Supports high-speed 50-MHz SD 4-bit card (version 1.1)</li><li>• Support high-speed 52-MHz MMC 8-bit card</li></ul>
	<b>Supported media type with card adapter</b>	<ul style="list-style-type: none"><li>• MicroSD (T-Flash)</li><li>• Memory Stick Micro</li></ul>
	<b>Mechanical</b>	
	<b>Environmental</b>	<b>Operational</b>
		<b>Environmental Extremes</b>
		Test Parameters/Conditions – Power applied, unit operating on system $\pm 5\%$ nominal supply voltage. 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
		<b>Storage Environmental Extremes</b>
		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
	<b>Approvals</b>	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:

- US Energy Star
- Blue Angel
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration
- Japan PC Green label\*
- EPEAT (Silver)

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

#### Ultra-Slim Desktop

##### System Configuration

The Energy Consumption and Declared Noise Emissions data for the Ultra-Slim Desktop is based on a typically configured model:

Processor	3.2 GHz
Memory	512 MB
Hard drive	40 GB

##### Energy Consumption

	115 VAC	230 VAC	100 VAC
Normal Operation	72 W	66 W	73 W
Sleep*	3.9 W	4.2 W	2.5 W
Off	1.0 W	1.3 W	2.6 W

##### Heat Dissipation\*\*

	115 VAC	230 VAC	100 VAC
Normal Operation	246 BTU/hr	226 BTU/hr	250 BTU/hr
Sleep*	13 BTU/hr	14 BTU/hr	9 BTU/hr
Off	3 BTU/hr	4 BTU/hr	9 BTU/hr

#### NOTES:

\* Energy Star low energy mode

\*\* 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)
Idle	3.6	25
Fixed Disk (random writes)	3.9	29
Optical Drive (sequential reads)	4.7	36



### Technical Specifications - Environmental Data

#### Longevity and Upgrading

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 5 years after the end of production. Upgradeability features contained in the product include:

- Intel LGA775 processor socket
- 8 USB ports
- 1 multi-bay port
- 1 empty PCI slot (w/ optional riser card)
- 1 internal drive slot
- 3 memory slots
- 1 Serial Port (optional)

#### 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 the IEEE 1680 (EPEAT) standard at the SILVER level, see <http://www.epeat.net>.
- 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.
- 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% recyclable when properly disposed of at end of life.

#### Packaging Materials

External	Corrugated Paper	1600 g
Internal	LDPE Foam	260 g
	LDPE Bag	2 g

### Small Form Factor

#### System Configuration

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

Processor	2.8 GHz
Memory	512 MB
Hard drive	80 GB

### Technical Specifications - Environmental Data

#### Energy Consumption

	115 VAC	230 VAC	100 VAC
Normal Operation	88.5 W	84.5 W	89.5 W
Sleep*	4.2 W	4.2 W	4.5 W
Off	1.0 W	1.0 W	1.3 W

#### Heat Dissipation\*\*

	115 VAC	230 VAC	100 VAC
Normal Operation	302 BTU/hr	299 BTU/hr	307 BTU/hr
Sleep*	14 BTU/hr	14 BTU/hr	15 BTU/hr
Off	3 BTU/hr	3 BTU/hr	14 BTU/hr

#### NOTES:

\* Energy Star low energy mode

\*\* 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)
Idle	4.0	29
Fixed Disk (random writes)	4.0	30
Optical Drive (sequential reads)	5.4	45

#### Longevity and Upgrading

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 5 years after the end of production. Upgradeability features contained in the product include:

- Intel LGA775 processor socket
- 8 USB ports
- 2 multi-bay ports (optional)
- 4 empty PCI slots (2 standard, 2 low profile))
- 1 internal drive slots
- 4 memory slots
- 1 Serial Port (optional)

#### 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

### Technical Specifications - Environmental Data

#### Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the SILVER level, see <http://www.epeat.net>.
- 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.
- 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 74% recyclable when properly disposed of at end of life.

#### Packaging Materials

External	Corrugated Paper	1600 g
Internal	LDPE Foam	260 g
	LDPE Bag	2 g

### Convertible Minitower

**System Configuration** The Energy Consumption and Declared Noise Emissions data for the Convertible Minitower is based on a typically configured model:

Processor	2.8 GHz
Memory	256 MB
Hard drive	80 GB

#### Energy Consumption

	115 VAC	230 VAC	100 VAC
Normal Operation	80 W	76 W	80 W
Sleep	3.6 W	4.1 W	3.5 W
Off	1.4 W	1.9 W	1.4 W

#### Heat Dissipation\*\*

	115 VAC	230 VAC	100 VAC
Normal Operation	274 BTU/hr	260 BTU/hr	274 BTU/hr
Sleep	12 BTU/hr	14 BTU/hr	12 BTU/hr
Off	5 BTU/hr	6 BTU/hr	5 BTU/hr

#### NOTES:

\* Energy Star low energy mode

\*\* 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)	Deskside Sound Pressure (LpAm, decibels)
Idle	4.2	25
Fixed Disk (random writes)	4.4	27
Optical Drive (sequential reads)	4.8	31

### Technical Specifications - Environmental Data

#### Longevity and Upgrading

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 5 years after the end of production. Upgradeability features contained in the product include:

- Intel LGA775 processor socket
- 8 USB ports
- 4 multi-bay ports (optional)
- 4 empty PCI slots (2 standard, 2 low profile)
- 2 internal drive slots
- 4 memory slots
- 1 Serial Port (optional)

#### 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 the IEEE 1680 (EPEAT) standard at the SILVER level, see <http://www.epeat.net>.
- 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.
- 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% recyclable when properly disposed of at end of life.

#### Packaging Materials

External	Corrugated Paper	1612 g
Internal	LDPE Foam	296 g

### 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. From 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).

Prior to this date, customers interested in purchasing RoHS compliant product should contact their local HP sales or distribution office to determine specific configuration status.

### Technical Specifications - Environmental Data

#### 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](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/recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

#### Hewlett-Packard Corporate Environmental Information

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

[link to new HP white paper now in progress]

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>

### *Technical Specifications - Environmental Data*

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