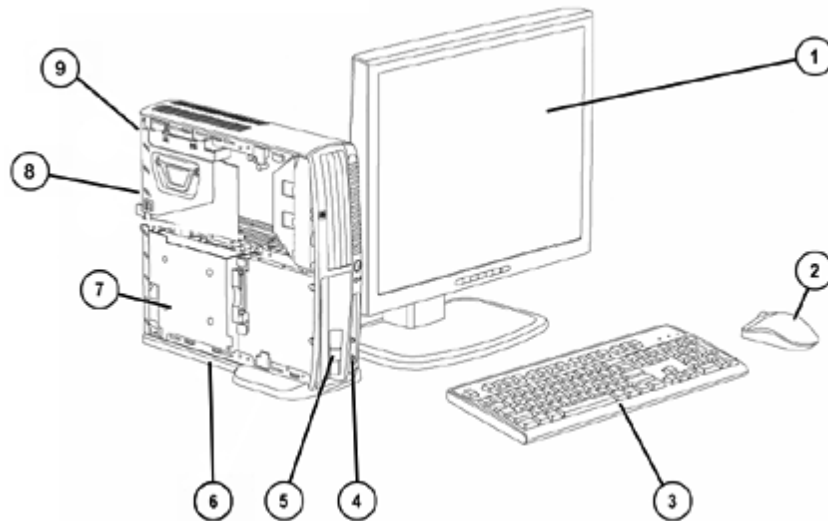


Overview

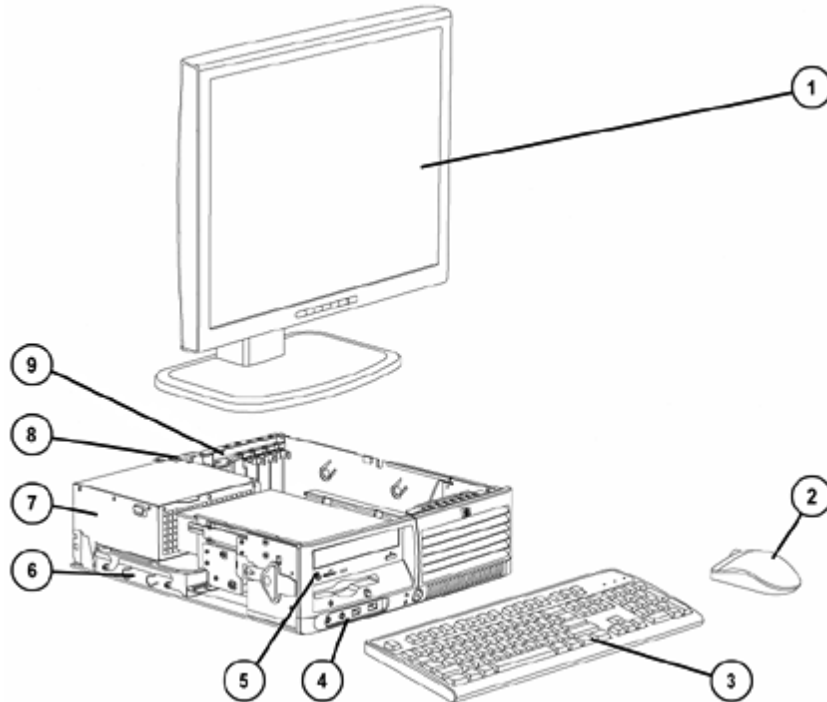
Ultra-slim Desktop



1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2)
3. 2004 Standard Keyboard (PS/2)
4. Front I/O: 2 USB 2.0, headphone and microphone
5. 1 external MultiBay
6. 1 3.5" internal bay
7. 200-watt power supply
8. 1 full-height PCI slot
9. Rear I/O: 6 USB 2.0, 1 optional serial port, 1 optional parallel port (available via PCI card), 2 PS/2, 1 RJ-45, 1 VGA, audio in/out

Small Form Factor

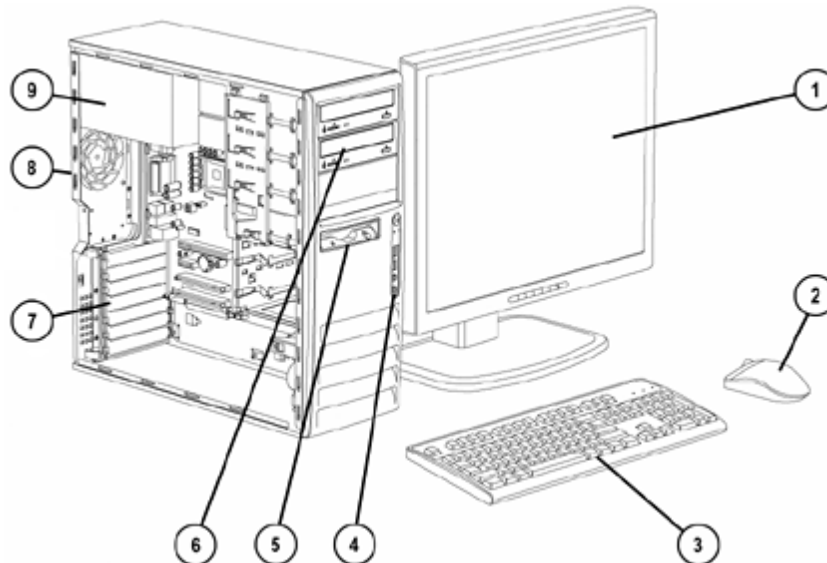
Overview



1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2)
3. 2004 Standard Keyboard (PS/2)
4. Front I/O: 2 USB 2.0, headphone and microphone
5. 1 5.25" and 1 3.25" external bays for optional diskette drive or other devices
6. 1 3.5" internal bay
7. 240-watt power supply
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
9. 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 not supported.

Convertible Minitower



Overview

1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2)
3. 2004 Standard Keyboard (PS/2)
4. Front I/O: 2 USB 2.0, headphone and microphone
5. 1 3.5" external bay for optional diskette drive 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 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. 340-watt power supply

At A Glance

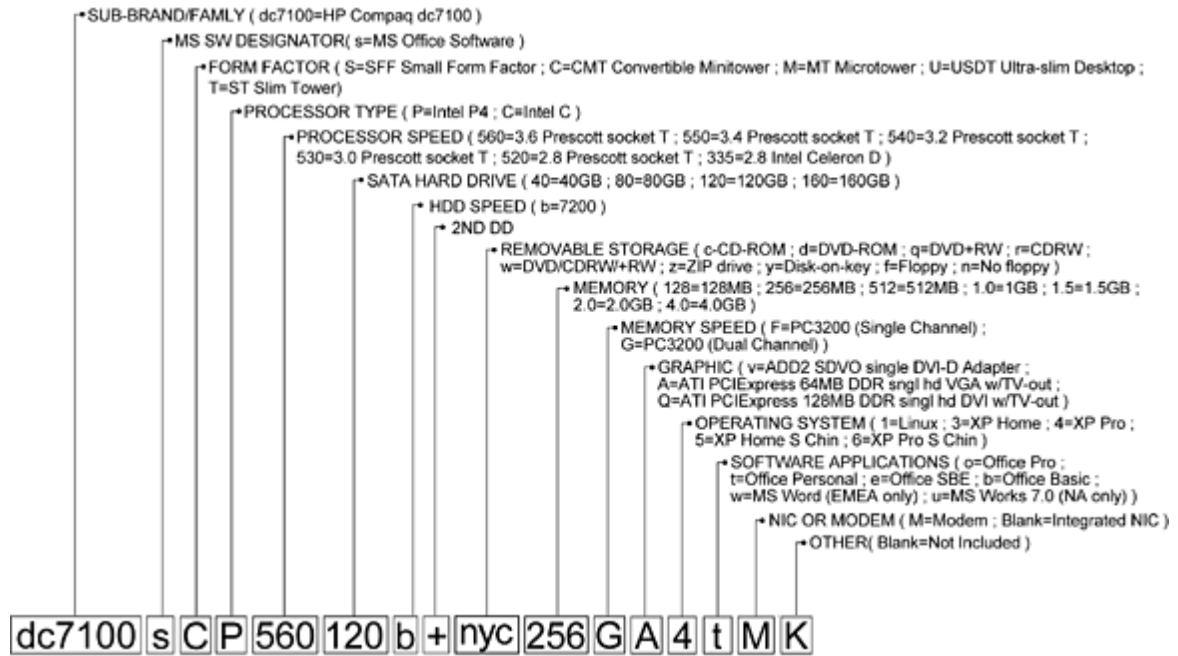
- Intel® Pentium® 4 processors
- Choice of operating systems:
 - Microsoft Windows XP Professional
 - Microsoft Windows XP Home
 - SuSE Linux Personal 9.2 OEM (delivered on CDs with system, not pre-installed)– WW except Asia
 - Turbolinux 10D (delivered on CDs with system, not pre-installed)– China only
- Intel 915G Express chipset with Integrated Intel Graphics Media Accelerator 900
- DDR Synch Dram PC3200 (DDR400) Memory
- Integrated Broadcom NetXtreme Gigabit ethernet
- 800-MHz processor front side bus support
- Intel Hyper-Thread Technology*¹
- Serial ATA Hard Drives
- Support for PCI Express
- SoundMax Digital AC97 integrated audio with internal speaker
- Manageability tools included
- Energy Star compliance with energy-saving features
- Protected by HP Services, including a 3-3-3 standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.

¹ The Hyper-Threading feature is a new technology designed to improve performance of multi-threaded software products; please contact your software provider to determine software compatibility. Not all customers or software applications will benefit from the use of hyperthreading. Visit <http://www.intel.com/info/hyperthreading/> for more information.

Standard Features - Select Models (localized by Regions)

HP Compaq Business Desktop dc7100 Series

Model Key and Example



Standard Features - Custom Components

		USDT	SFF	CMT	
Processor and Speed - One of the following	Intel Celeron D Processors: 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 Pentium 4 Processors with HT Technology Intel Pentium 4 520 Processor (2.8-GHz, 1 MB L2 cache, 800 MHz FSB)	X	X	X	
	Intel Pentium 4 521 Processor (2.8-GHz, 1 MB L2 cache, 800 MHz FSB)	X	X	X	
	Intel Pentium 4 530 Processor (3.0-GHz, 1 MB L2 cache, 800 MHz FSB)	X	X	X	
	Intel Pentium 4 531 Processor (3.0-GHz, 1 MB L2 cache, 800 MHz FSB)	X	X	X	
	Intel Pentium 4 540 Processor (3.2-GHz, 1 MB L2 cache, 800 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 4 550 Processor (3.4-GHz, 1 MB L2 cache, 800 MHz FSB)	X	X	X	
	Intel Pentium 4 551 Processor (3.4-GHz, 1 MB L2 cache, 800 MHz FSB)	X	X	X	
	Intel Pentium 4 560 Processor (3.6-GHz, 1 MB L2 cache, 800 MHz FSB)		X	X	
	Intel Pentium 4 630 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 4 650 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	X	
	Intel Pentium 4 670 Processor (3.8-GHz, 2 MB L2 cache, 800 MHz FSB)		X	X	
	Operating System - One of the following	Microsoft Windows XP Professional SP2	X	X	X
		Microsoft Windows XP Home SP2	X	X	X
		SuSE Linux Personal 9.2 OEM (delivered on CDs with system, not pre-installed)– WW except Asia	X	X	X
Turbolinux 10D (delivered on CDs with system, not pre-installed) – China only		X	X	X	
NOTE: Microsoft Windows NT 4.0 and Microsoft Windows 2000 are not available on system, but Softpaq drivers are downloadable from hp.com .					

Standard Features - Custom Components

Hard Drive - One of the following	40-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)	X	X	X
	80-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)	X	X	X
	160-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)	X	X	X
	250-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)	X	X	X
	2nd hard drive, 40-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)		X	X
	2nd hard drive, 80-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)		X	X
	2nd hard drive, 160-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)		X	X
	2nd hard drive, 250-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)		X	X

Memory - One of the following	128-MB DDR Synch Dram PC3200 (400-MHz) Non ECC (1 x 128)	X	X	X
	256-MB DDR Synch Dram PC3200 (400-MHz) Non ECC (1 x 256)	X	X	X
	512-MB DDR Synch Dram PC3200 (400-MHz) Non ECC (1 x 512)	X	X	X
	512-MB DDR Synch Dram PC3200 (400-MHz) Non ECC (2 x 256)	X	X	X
	1-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (1 x 1GB)	X	X	X
	1-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (4 x 256)	-	X	X
	1-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (2 x 512)	X	X	X
	1.5-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (2 x 256, 2 x 512)	-	X	X
	2-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (2 x 1GB)	X	X	X
	2-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (4 x 512)	-	X	X
	3-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (3 x 1GB)	X	-	-
	4-GB DDR Synch Dram PC3200 (400-MHz) Non ECC (4 x 1GB)	-	X	X

NOTE: For best performance, memory speeds and sizes should not be mixed. See memory section for more information.

Standard Features - Custom Components

Storage - One of the following	Diskette and Zip Drives			
	1.44-MB Diskette Drive	-	X	X
	Zip 250 for 3.5" Drive Bay	-	X	X
	Zip 250 for 5.25" Drive Bay	-	X	X
	USB Drives			
	256MB USB HP Drive Key II (USB 2.0)	X	X	X
	Optical Drives			
	48X CD-ROM Drive	-	X	X
	52X CD-ROM Drive – APJ only	-	X	X
	16X/40X DVD-ROM	-	X	X
	48X/32X/48X CD-RW Drive	-	X	X
	48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive	-	X	X
	16X DVD+R/RW Drive	-	X	X
	MultiBay			
	Multibay Drive Adapter	-	X	X
	MultiBay 24X CD-ROM Drive	X	X	X
MultiBay 24X/24X/24X/8X DVD-CDRW Combo Drive	X	X	X	
MultiBay 8X/24X DVD-ROM with +R Drive	X	X	X	
Multibay 1.44MB diskette drive	X	-	-	
<hr/>				
Keyboard - One of the following	PS/2 2004 Standard Keyboard	X	X	X
	USB 2004 BG1650 Blue Angel Compliant Keyboard - Europe Only	X	X	X
	USB 2004 Standard Keyboard	X	X	X
<hr/>				
Mouse - One of the following	PS/2 2-Button Scroll Mouse	X	X	X
	USB 2-Button Optical Mouse	X	X	X
	USB 2-Button Scroll Mouse	X	X	X
<hr/>				
Modem	Agere 56K full-height PCI SoftModem			X
	Agere 56K low-profile PCI SoftModem	X	X	
<hr/>				
Audio	SoundMax Digital AC97 integrated audio with internal speaker	X	X	X
<hr/>				
NIC	Integrated Broadcom NetXtreme	X	X	X
	Broadcom NetXtreme Gigabit ethernet	X	X	X
	Intel Pro 1000 MT Gigabit NIC	X	X	X

Standard Features - Custom Components

Miscellaneous				
	IEEE 1394 PCI Card	X	X	X
	USB to printer adapter cable	X	-	-
	USB to serial adapter	X	-	-
	PCI riser card – adds 2 full-height PCI slots. NOTE: Low profile slots are unusable with riser card installed.	-	X	-
	PCI extender card for CMT (adds 2 PCI)	-	-	X
	Serial & parallel I/O adapter	X	-	-
	2nd serial port option	-	X	X
	Tower stand	X	X	-
	Blue Angel Compliant Bezel – Europe Only	X	X	X

Graphics		USDT	SFF	CMT
	Integrated Intel Graphics Media Accelerator 900 graphics	X	X	X
	DVI ADD2 card full height	-	-	X
	DVI ADD2 card low profile	-	X	-
	ATI RADEON X300 SE PCI Express 64-MB DDR singlehead VGA with TV out and low profile bracket	-	X	-
	ATI RADEON X300 SE PCI Express 128-MB DDR singlehead DVI with TV out and low profile bracket	-	X	-
	ATI RADEON X300 SE PCI Express 64-MB DDR singlehead VGA with TV out and full height bracket	-	-	X
	ATI RADEON X300 SE PCI Express 128-MB DDR singlehead DVI with TV out and full height bracket	-	-	X
	NVIDIA Quadro NVS 280 64MB PCI	X	X	X
	NVIDIA Quadro NVS 50 64MB PCI	X	X	X

Security				
	Solenoid and Hood Sensor	-	X	X
	Hood Sensor	X	-	-
	Chassis clamp lock, universal, with cable	X	X	X
	Security cable with Kensington lock	X	X	X
	Rear port control cover	X	X	X
	HP ProtectTools Embedded security module (TPM)	X	X	X
	HP ProtectTools Security Manager:	X	X	X
	- Smart Card Security for HP ProtectTools			
	- Embedded Security for HP ProtectTools			
	- Credential Manager for HP ProtectTools			

Standard Features - Custom Components

Software	Norton AntiVirus 2005	X	X	X
	Microsoft Office XP Professional	X	X	X
	Microsoft Office XP Small Business Edition	X	X	X
	Microsoft Office 2003 Basic	X	X	X
	Microsoft Office 2003 Personal	X	X	X
	Microsoft Office 2003 Professional	X	X	X
	Microsoft Office 2003 Small Business	X	X	X
	Microsoft Works 7.0	X	X	X
	Altiris Local Recovery	X	X	X
	PDF Complete	X	X	X
	Corel Word Perfect Office 11	X	X	X
	Sun Java Runtime Environment	X	X	X
	ZIM SMS Mail	X	X	X
	Acrobat Reader	X	X	X

HP Client Management Solutions visit <http://www.hp.com/go/easydeploy>.

Standard Features

	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Operating System (choice)			
Microsoft Windows XP Professional SP1a	X		
Microsoft Windows XP Home SP1a	X		
Processor	Intel Pentium 4 processors		
CPU Bus Speed Supported	800-MHz		
Standard L2 Cache	1024-KB		
Chipset	Intel 915GV Express	Intel 915G Express	Intel 915G Express
Memory Expansion Slots	3 DIMM's	4 DIMM's	4 DIMM's
Memory Type Supported	Non-ECC DDR Synch Dram (ECC not supported by Chipset)		
Memory Speed Supported	DDR Synch DRAM PC3200 (400MHz) non-ECC		
Maximum Memory*	3-GB	4-GB	4-GB
Network controller	Integrated Broadcom NetXtreme Gigabit thernet for HP		
Graphics	Integrated Intel Graphics Media Accelerator 900		
Audio	Integrated digital audio with S/Pdif 6-channel pass-through, stereo microphone, active noise cancellation and Yamaha XG Lite Softsynth support		
*NOTE: Above 3-GB, all memory may not be available due to system resource requirements.			
Expandability			
PCI slots	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. NOTE: With riser card option, express x1 and x16 slots are not supported.	2 full-height (4.2"), length (13.4") standard; (2 additional slots available via optional extender card)
PCI Express x16 slot	--	1 low-profile (2.5"), length (6.6")	1 full-height (4.2"), length (10.5")
PCI Express x1 slot	--	1 low profile (2.5"), length (6.6")	1 full-height (4.2"), length (13.4")
AGP slot	none	none	none
External Bays	1 MultiBay	2 bays (1 - 5.25", length (8.189"), and 1 - 3.5" (supports 2nd HDD))	4 bays (2 - 5.25", length (8.189"), 1 - 5.25" length (5.71") and 1 - 3.5")
Internal Bays	1 - 3.5" hard drive bay	1 - 3.5" hard drive bay	2 - 3.5" hard drive bays
MultiBay	standard	optional via MultiBay adapter	optional via MultiBay adapter
IDE	1 IDE connector for opticals	1 IDE connector for opticals	1 IDE connector for opticals
Serial-ATA	1 serial-ATA connector for SATA hard drive	2 serial-ATA connectors for SATA hard drives	4 serial-ATA connectors for SATA hard drives

Standard Features

Ports			
USB 2.0	8 (2 front, 6 rear)	8 (2 front, 6 rear)	8 (2 front, 6 rear)
Serial	1 optional via USB serial adapter	1 standard with 2nd optional	1 standard with 2nd optional
Parallel	1 optional via USB printer 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 PCI card	available via ADD2 card, PCI-E x16 card, and PCI card	available via ADD2 card, PCI-E x16 card, and PCI card
Support for Multi-Monitor	available via PCI card	available via ADD2 card, PCI-E x16 card, and 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	Integrated Broadcom Gigabit	Integrated Broadcom Gigabit	Integrated Broadcom Gigabit
Dimensions			
Chassis Dimensions (H x W x D)	2.95 x 12.4 x 13.18 in	3.95 x 13.3 x 14.9 in	17.65 x 6.6 x 17.8 in
Chassis Dimensions (H x W x D)	7.49 x 31.50 x 33.48 cm	10.03 x 33.78 x 37.85 cm	44.83 x 16.76 x 45.21 cm
System weight	13.2 lb	19.5 lb	32.5 lb
System volume	7.9 liters	12.8 liters	33.8 liters
Shipping weight	19 lb	30 lb	43 lb
Shipping box dimensions (H x W x D)	12.63 x 18.75 x 20 in	12.63 x 18.75 x 20 in	23.38 x 13.06 x 22.88 in
Power Supply	200W power supply – Active PFC	240W power supply – Active PFC	340W power supply – Active PFC
Hard Drive Interfaces Supported	1 Serial ATA interface	2 Serial ATA interfaces	2 Serial ATA interfaces
Hard Drive Controller (PCI) Supported	Serial ATA		
Preinstalled Software			
Computer Setup Utility	X		
Diagnostics for Windows	X		
Microsoft Internet Explorer	X		

After-Market Options

		USDT	SFF	CMT	Part Number
Communications	Wireless LAN				
	HP USB Bluetooth transceiver (BT1.2)	X	X	X	DN650B
	HP WL500 PCI (802.11a/b/g) WiFi wireless LAN	X	X	X	DV649A
	NICs				
	Broadcom NetXtreme Gigabit Ethernet PCI Adapter	X	X	X	DC194A
	Intel Pro/1000 MT Gigabit Ethernet PCI Adapter (full height only)	X	X	X	DC193A
	Intel Pro/1000 MT Gigabit Ethernet PCI Adapter (low profile only)	-	X	-	DC193B
Modem					
Agere 56K PCI Modem	X	X	X	DC132D	
Graphics	Single head solutions				
	DVI-D ADD2 adapter, normal pinout	-	-	X	DY674A
	DVI-D ADD2 adapter, reverse pinout	-	X	-	DY673A
	ATI RADEON X300 SE PCI Express 64-MB DDR singlehead VGA with TV out	-	X	X	DY597A
	ATI RADEON X300 SE PCI Express 128-MB DDR singlehead DVI with TV out	-	X	X	DY596A
	NVIDIA Quadro NVS 50 64MB PCI single head DVI-I with TV out	X	X	X	PU615AA
	Multi head solutions				
	NVIDIA Quadro NVS 280 64MB PCI dual head (DMS59 connector with dual VGA Y-cable)	X	X	X	DY599A
	NVIDIA Quadro NVS 280 64MB PCIE dual head (DMS59 connector with dual VGA Y-cable)	-	X	X	DY650A
	Dual DVI Y-cable for DY599A or DY650A	X	X	X	DL139A
Hard Drives	Serial ATA SMART III Hard Drives				
	40-GB ATA SMART III Hard Drive (7200 rpm)	X	X	X	PB317A
	80-GB ATA SMART III Hard Drive (7200 rpm)	X	X	X	DE705A
	120-GB ATA SMART III Hard Drive (7200 rpm)	X	X	X	PA995A
	160-GB ATA SMART III Hard Drive (7200 rpm)	X	X	X	DE706A

After-Market Options

Input/Output Devices	Keyboards				
	HP PS/2 2004 Standard Keyboard	X	X	X	DT527A
	HP USB 2004 Standard Keyboard	X	X	X	DT528A
	Smartcard adapter for 2004 Modular Keyboard	X	X	X	DT531A
	Wireless (BT) adapter kit for 2004 Modular Keyboard	X	X	X	DT532A
	Pointing Devices				
	HP Bluetooth Optical Mouse (included in DT532A)	X	X	X	PA720A
	HP PS/2 2-Button Scroll Mouse (Carbonite)	X	X	X	DD440B
	HP USB 2-Button Scroll Mouse (Carbonite)	X	X	X	DD441B
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	X	X	X	DC172B
Memory (DIMMs)	PC3200 (DDR400-MHz) DIMMs Non-ECC				
	128-MB DDR Synch Dram PC3200 (DDR400)	X	X	X	DE465G
	256-MB DDR Synch Dram PC3200 (DDR400)	X	X	X	DE466G
	512-MB DDR Synch Dram PC3200 (DDR400)	X	X	X	DE467G
	1-GB DDR Synch Dram PC3200 (DDR400)	X	X	X	DE468G
Monitors	TFTs				
	HP L1502 Flat Panel Monitor (15" analog only)	X	X	X	P9617D#ABA
	HP L1530 Flat Panel Monitor (15" analog/digital & multimedia)	X	X	X	P9624A#ABA
	HP L1702 Flat Panel Monitor (17" analog only)	X	X	X	P9621D#ABA
	HP L1730 Flat Panel Monitor (17" analog/digital & multimedia)	X	X	X	P9625A#ABA
	HP L1925 Flat Panel Monitor (19" analog/digital)	X	X	X	P9626A#ABA
	HP L2035 Flat Panel Monitor (20")	X	X	X	P9614A#ABA
	HP L2335 Flat Panel Monitor (23" widescreen)	X	X	X	P9615A#ABA
	CRTs				
	HP v7550 CRT Monitor (17" flat-face)	X	X	X	P9013A#ABA
	HP s9500 CRT Monitor (19")	X	X	X	P9010A#ABA
	HP p1230 CRT Monitor (22" natural flat)	X	X	X	P9613A#ABA

After-Market Options

Multimedia	Harman/Kardon Satellite speaker pair (EMEA only)	X	X	X	DL983A
	JBL Platinum Series Speakers – Carbonite	X	X	X	DE893B
	HP Desktop Access Center	X	X	X	DK985A
	Logitech Axis202 PC Headset (analog, no mute)	X	X	X	DE640A
<hr/>					
Optical Drives	DVD-ROM Drive				
	16X/40X DVD-ROM	-	X	X	DC151B
	16X/48X DVD-ROM	-	X	X	PR596A
	CD-ROM Drive				
	48X Max CD-ROM Drive	-	X	X	DC143B
	CD-RW Drive				
	48X/32X/48X CD-RW Drive	-	X	X	DL975B
	Combo Drive				
	48X/32X Combo DVD-ROM/CD-RW Drive	-	X	X	DL976B
	DVD+/-RW Drive				
16X DVD+/-RW LightScribe Drive (Double Layer/Dual Format)	-	X	X	PR595A	
<hr/>					
Removable Storage	Drive Key Options				
	256-MB HP Drive Key II (USB 2.0)	X	X	X	PH657A
	512-MB HP Drive Key II (USB 2.0)	X	X	X	ED516AA
	Diskette and Digital Drives				
	1.44-MB USB Diskette Drive - External (Carbonite)	X	X	X	DC141B
	1.44-MB Internal Diskette Drive	-	X	X	DS710B
	Zip Drives and Media				
	Zip 250 Drive (Carbonite)	-	X	X	DC140B
Zip 750 Drive (Carbonite)	-	X	X	DC518B	

After-Market Options

MultiBay Drive Storage	MultiBay Drive Adapter	-	X	X	DC149B
	Multibay 40GB hard drive	X	X	X	DC365A
	Multibay 60GB hard drive	X	X	X	DC894A
	Multibay 80GB hard drive	X	X	X	DC920A
	Multibay 1.44-MB Diskette Drive	X			DE612B
	MultiBay 24X CD-ROM Drive	X	X	X	DC513B
	MultiBay 4X DVD+R/+RW Drive	X	X	X	DG189A
	MultiBay 24X/24X/24X/8X Combo DVD-ROM/CD-RW Drive	X	X	X	DL974B
	MultiBay 8X DVD-ROM Drive (reads all formats)	X	X	X	DC515B

NOTE: In order to use Multibay devices on SFF & CMT, the Multibay Drive adapter is required

Security	Security cable with Kensington lock	X	X	X	DC368A
	Chassis clamp lock, universal, no cable	X	X	X	DE817A
	HP Business PC Security Lock Kit	X	X	X	PV606AA
	Wall mount/security sleeve (USDT)	X	-	-	PA719A
	Wall mount/security sleeve (SFF)	-	X	-	PA717A

Software	HP Client Foundation Suite	X	X	X	EF117AA
	HP Client Manager				(use EF118AA for 1000+ licenses)
	HP Systems Insight Manager Connector				
	Altiris Local Recovery Pro				
	Altiris Migration Suite				
	HP Client Premium Suite	X	X	X	EF119AA
	HP Client Manager				(use EF120AA for 1000+ licenses)
	HP Systems Insight Manager Connector				
	Altiris Local Recovery Pro				
	Altiris Migration Suite				
	Altiris Connector Solution				
	Altiris Client Management Suite Level 1				
	HP OpenView Connector				

Brackets/Stand	HP Compaq 7000 Series Ultra-slim Desktop Integrated Work Center Stand (no display)	X	-	-	DL641B
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Miscellaneous Accessories	Serial and parallel I/O adapter (USDT)	X	-	-	PD825A
	USB to parallel printer adapter	X	-	-	P8821A
	USB to serial adapter	X	-	-	PA718A
	2nd serial port (SFF)	-	X	-	PA716A
	PCI riser card (SFF)	-	X	-	PD824A
	IEEE 1394 PCI Card	X	X	X	PA997A

Memory

915GV Express chipset

DDR SYNCH DRAM NON-ECC MEMORY

It is not necessary to add memory in pairs. 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 915G/GV Express chipsets support non-ECC DDR PC2700 (333-MHz) and non-ECC DDR PC3200 (400-MHz) memory.

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

MAXIMUM MEMORY (ULTRA-SLIM DESKTOP)

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

DIMM Size	Slot		
	Channel A	Channel B	
	1	2	3
128-MB	128-MB		
256-MB (dual channel)	128-MB		128-MB
512-MB	512-MB		
512-MB (dual-channel)	256-MB		256-MB
1-GB (dual channel)	1-GB		
1-GB (dual channel)	512-MB		512-MB
2-GB	1-GB		1-GB
2-GB	512-MB	512-MB	1-GB
3-GB maximum	1-GB	1-GB	1-GB

915G Express chipset

DDR SYNCH DRAM NON-ECC MEMORY

It is not necessary to add memory in pairs. 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 915G Express chipset supports non-ECC DDR PC2700 (333-MHz) and non-ECC DDR PC3200 (400-MHz) memory.

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

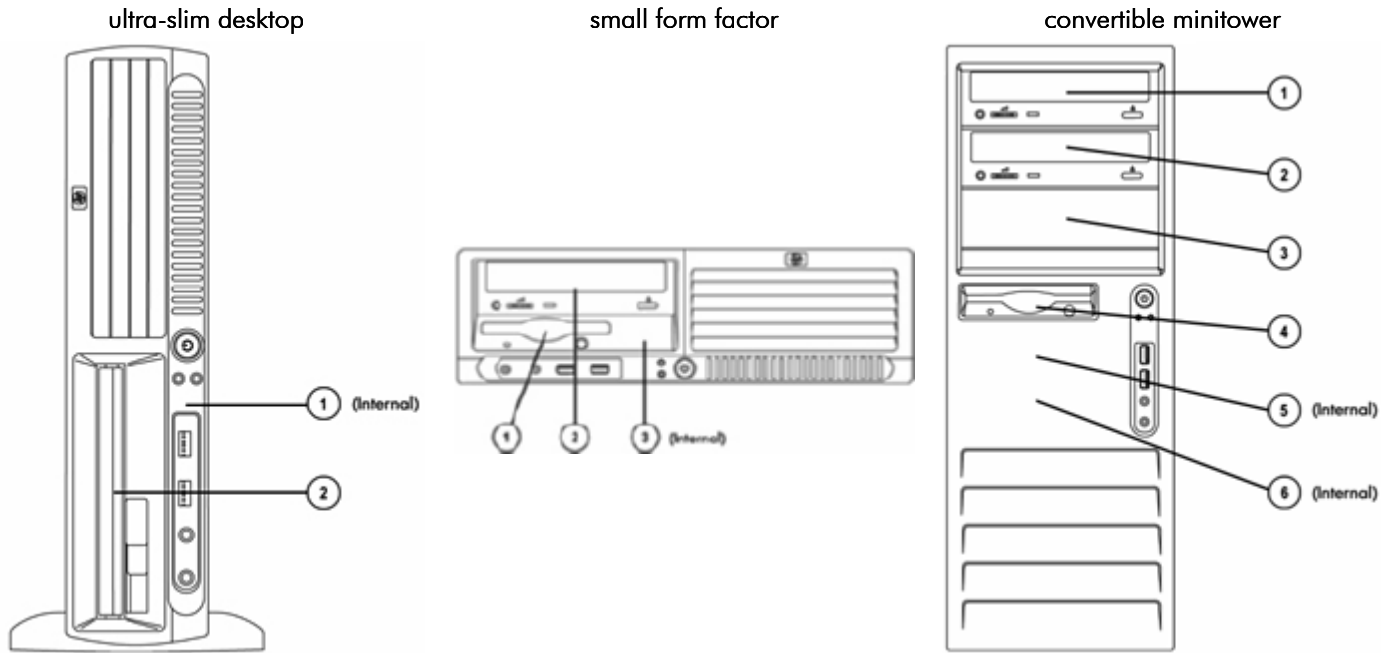
MAXIMUM MEMORY (SMALL FORM FACTOR AND CONVERTIBLE MINITOWER)

Supports up to 4-GB of DDR SYNCH DRAM. *Above 3-GB, all memory may not be available due to system resource requirements. Not all memory configurations possible are represented below.*

Memory

DIMM Size	Slot			
	Channel A		Channel B	
	1	2	3	4
128-MB	128-MB			
256-MB (dual-channel)	128-MB		128-MB	
512-MB	512-MB			
512-MB (dual-channel)	256-MB		256-MB	
1-GB	1-GB			
1-GB (dual-channel)	512-MB		512-MB	
2-GB (dual channel)	1-GB		1-GB	
2-GB (dual-channel)	512-MB	512-MB	512-MB	512-MB
4-GB maximum (dual-channel)	1-GB	1-GB	1-GB	1-GB

Storage



Ultra-slim Desktop

Hot-swappable MultiBay Drive
3.5" Serial ATA Hard Drive

Quantity Supported

1
1

Position Supported

2
1

Controller

IDE
SATA

Small Form Factor

Diskette Drives (optional)
Storage Drive Bay
3.5" Serial ATA Hard Drives
MultiBay Drive (optional, with adapter)

1
1
1
2

1
2
1, 3
2

Diskette
IDE
SATA
IDE

Convertible Minitower

Diskette Drive
Storage Drive Bay
3.5" Serial ATA Hard Drives
MultiBay Drive (optional, with adapter)

1
2
2
2

4
1, 2, 3
4, 5, 6
1, 2, 3

Diskette
IDE
SATA
IDE

Technical Specifications

Base Unit Contents	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
Coprocessor	Integrated		
L2 Cache Architecture/Speed	Full core clock speed		
Cache Upgradeable	Not upgradeable – Integrated into Processor		
System board with Intel 915 Express Chipset with Integrated graphics	X		
Cables	Serial ATA Cable		
Quick Setup Poster	X		
Product Documentation on CD	X		
Operating System CD	X		
Restore CD	X		
Power Cord	X		
Keyboard	X (PS/2)		
Mouse	X (PS/2)		
Memory Parity	Not Needed for non-ECC		
ECC Memory	Not Supported by chipset		
Serial Presence Detect Support	Supported		
Hard Drive Interfaces Supported	1 Serial ATA interface	2 Serial ATA interfaces	2 Serial ATA interfaces
Hard Drive Controller (PCI) Supported	Serial ATA		

System Board	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
Architecture	P4/PCI/PCI Express		
Chipset	Intel 915GV Express Chipset	Intel 915G Express Chipset	Intel 915G Express Chipset
I/O Controller	LPC47B397		
System Board Form Factor	custom	custom	micro ATX
Processor Socket - 775 Pin ZIF	X		
DIMM Connectors (2.5V)	3	4	4
Intel Graphics Media Accelerator 900 integrated	X		
PCI Connector	1	2 low profile standard (2 Full height available with optional riser card)	2 full height (2 full height additional with optional extender card)
PCI Express x16			
PCI Express x1			
Flash ROM	X		
Audio (AC97 Integrated Audio)	X		
CD ROM IN (Audio)	X		
AUX IN (Audio)	X		
Clear CMOS Button	X		
CPU Fan Header	X		
Chassis Fan Header	X		
Chassis Speaker Header	X		
CMOS Battery Holder – Lithium	X		
Hood Lock Header	--	Optional	Optional
Hood Sensor Header	Optional		

Technical Specifications

Multibay Header	X	X	X
Integrated Broadcom NetXtreme Gigabit ethernet for HP		X	
Wake-On-Lan®		X	
ASF 2.0 (Alert Standard Format)		X	
Power Supply Header		X	
Power Switch, Power LED & Hard Drive LED Header		X	
Password Clear Header		X	
Riser Connector	X	X	--
PCI extender that connects to System Board	--	--	X

Chassis	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
Color	Carbonite/Silver		
System Board Form Factors Supported	custom	custom	micro ATX
Power Supply Fan (Variable Speed)		X	
Processor Fan-Heatsink (Variable Speed)		X	
Chassis Fan		X	
Internal Speaker		X	
Security Locks Supported	Kensington Cable Lock Provision (Lock not included) Hood Cover Security Loop (Lock not included)		
Security Loop hole diameter	.236 inches		

Unit Environment and Operating Conditions	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
General Unit Operating Guidelines			
<ul style="list-style-type: none"> Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow. Never restrict airflow into the computer by blocking any vents or air intakes. Do not stack computers on top of each other or place computers so near each other that they are subject to each other's recirculated or preheated air. Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow. If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply. 			
Temperature Range	Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F (-30° to 60° C)		
Relative Humidity	Operating: 10% to 90% (non condensing at ambient) Non-operating: 5% to 95% (non condensing at ambient)		
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)		
<p>NOTE: 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>			

Technical Specifications

Interfaces	Ultra-Slim Desktop	Small Form Factor	Convertible Minitower
Serial Port	1 optional	1 standard, 2nd via option	1 standard, 2nd via option
Parallel Port	1 optional	1	1
PS/2	1 Keyboard and 1 Mouse		
USB (2.0)	8 ports (6 rear/2 front)		
RJ-45 10/100/1000 Network	X		
Keyboard	X (PS/2)		
Mouse	X (PS/2)		
Multibay	1 standard	optional	optional
Video (VGA)	X		
Audio	X		

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)	340 watt custom power supply – Active PFC)
Operating Voltage Range	90 – 132/180 – 264 VAC	90 – 132/180 – 264 VAC	90 – 132/180 – 264 VAC
Rated Voltage Range	100 – 127/200 – 240 VAC	100 – 127/200 – 240 VAC	100 – 127/200 – 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	5A/2.5A	5A/2.5A	6A/3A
Heat Dissipation	Typical 256 btu/hr (65 kg-cal/hr) Maximum 788 btu/hr (199 kg-cal/hr)	Typical 256 btu/hr (65 kg-cal/hr) Maximum 971 btu/hr (245 kg-cal/hr)	Typical 256 btu/hr (65 kg-cal/hr) Maximum 1260 btu/hr (318 kg-cal/hr)
Power Supply Fan	None; airflow is ducted from processor blower	60mm 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)	2.5W to 3W	2.5W to 3W	2.5W to 3W
Processor/Cache Memory Power – Down (S3)	< 3W	< 3W	< 3W
Environmental and Mechanical Engineering Support Center (EMESC) – Intranet Web Site only	http://env-websserver.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").

Technical Specifications

ROM Features	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Instantly Available PC (Suspend to RAM - S3)	Allows for very low power consumption with quick resume time	X	X	X
ROM Based F10 Setup	Review and customize BIOS settings	X	X	X
Remote System Installation via F12 (PXE) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system	X	X	X
System/Emergency ROM Flash Recovery with Video	Recovers corrupted system BIOS	X	X	X
BIOS Smart Card Support	BIOS preboot smart card authentication (passwords) via USB CCID compliant smart card readers	X	X	X
Auto Setup when New Hardware Installed	System automatically detects addition of new hardware	X	X	X
Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control	Enable or disables serial, parallel, USB, audio, and network ports	X	X	X
Removable Media Write/Boot Control	Prevents ability to boot from removable media on supported devices (and can disable writes to media)	X	X	X
Network Server Mode	Allows for secured keyboard-less operation	X	X	X
Power-On Password	Prevents an unauthorized person from booting up the computer	X	X	X
Setup Password	Prevents an unauthorized person from changing the system configuration	X	X	X
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM-based F10 setup	X	X	X
Master Boot Record Security	Detects changes to MBR and optional restoration, useful in protecting from viruses	X	X	X
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	X	X	X
Remote Wakeup	<ul style="list-style-type: none"> System administrators can power on, restart, and power off a client computer from a remote location. Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM 	X	X	X
ACPI (Advanced Configuration and Power Management Interface)	<ul style="list-style-type: none"> Allows the system to wake from a low power mode Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system 	X	X	X
Keyboard-less Operation	The system can be operated without a keyboard	X	X	X
SMBIOS	System Management BIOS, previously known as DMI BIOS, for system management information	X	X	X

Technical Specifications

Software	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Preinstalled Software		X	X	X
Microsoft Windows XP Professional SP1a		X	X	X
Microsoft Windows XP Home SP1a		X	X	X
Computer Setup Utility		X	X	X
Diagnostics for Windows		X	X	X
Microsoft Internet Explorer		X	X	X

Initial Configuration and Deployment	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
HP Client Management Solutions	<p>HP Client Management Solutions help simplify management of PCs and significantly reduce total ownership costs. These solutions share a common design and are highly integrated due to the extensive work between HP and its partner Altiris. HP Client Manager Software is included free with all HP business PCs. It enables central tracking, monitoring, and management of the hardware aspects of HP client systems:</p> <ul style="list-style-type: none"> • Get valuable hardware information such as CPU, memory, video, and security settings • Monitor system health to fix problems before they occur • Install drivers and BIOS updates without visiting each PC • Remotely configure BIOS and security settings • Automate processes to quickly resolve hardware problems <p>Additional Altiris solutions (fee-based) are available to address PC management challenges through the entire IT lifecycle including:</p> <ul style="list-style-type: none"> • Inventory assessment • Software license compliance • Personality migration • Software image deployment • Software distribution • Asset management • Client backup and recovery • Problem resolution <p>Visit http://www.hp.com/go/easydeploy for more information, to download HP Client Manager Software, and to evaluate the Altiris solutions.</p>	X	X	X
System Software Manager (free)	A free utility that detects and updates BIOS, device drivers, and management agent versions on your networked PCs	X	X	X
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM-based F10 setup	X	X	X

Technical Specifications

Support Software CD	--	X	X	X
Software Restore CD	Restores computer to its original factory shipping image	X	X	X
Asset Tag	<ul style="list-style-type: none"> Repository for storing company-specific property asset numbers for easy tracking Initially set equal to the system serial number Stored in a protected section of non-volatile memory that can be accessed and modified with the F10 Setup program 	X	X	X
DIMM Serial Presence Detect	Detects whether or not memory DIMMs are present and their type	X	X	X
Hard drive serial number, model, and manufacturer	Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM-based F10 setup	X	X	X
Monitor serial number, model & manufacturer	--	X	X	X
System serial number, model, & manufacturer	System serial number, model, & manufacturer stored in a non-volatile memory and can be retrieved with management SW or viewed in ROM-based F10 setup	X	X	X
ROM revision levels	<ul style="list-style-type: none"> Identifies system ROM revision levels and reports in ROM-based F10 setup Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information 	X	X	X
System board revision level	<ul style="list-style-type: none"> Allows management SW to read the revision level of the system board Revision level is digitally encoded into the hardware and cannot be modified 	X	X	X
Memory Change Alert	Alerts management console if memory is removed or changed	X	X	X
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen	X	X	X

Security Features	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Mechanical Hood Security Provision	Security Loop	X	X	X
Kensington Lock Support	Kensington lock slot on the chassis	X	X	X
Cable Lock Provision	Physically secure computer hardware from theft	X	X	X
Serial, Parallel, USB Enable/Disable	Enable or disable serial, parallel or USB ports and hide them from the operating system	X	X	X
Removable Media Write/Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	X	X	X
Power-On Password	Prevents an unauthorized person from booting up the computer	X	X	X
Setup Password	Prevents an unauthorized person from changing the system configuration	X	X	X

Technical Specifications

Fault Notification and Recovery	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
SMART Hard Drives, Fault & Prefailure Notification	<ul style="list-style-type: none"> Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure 	X	X	X
Memory Change Notification (Requires HP Client Manager Software)	Alerts management console if memory is removed or changed	X	X	X
Thermal Notification (Requires HP Client Manager Software)	<p>Monitors the temperature state within the chassis. Three modes:</p> <ul style="list-style-type: none"> NORMAL – normal temperature ranges ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs 	X	X	X
Altiris Local Recovery	Provides data and system file protection for HP business PCs to enable fast recovery of information that is accidentally deleted or if the system becomes corrupted. Designed for disconnected or seldom-connected users, Local Recovery protects your HP computer's data and system state by taking scheduled snapshots, which are then stored in a protected area on the local hard disk. System backup and disaster recovery is now simple and fast for all users, regardless of connectivity.	X	X	X
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000V	X	X	X
Ultra ATA Integrity Monitoring (CRC Checking)	<p>Provides data transfer verification and proactive notification of hard drive data transmission problems with recommendations for enhancing system performance. It detects all the following errors types:</p> <ul style="list-style-type: none"> single bit errors double bit errors an odd number of errors error bursts up to 32-bits long 	X	X	X

Technical Specifications

System Software Updating	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Subscriber's Choice	<p>Free web-based subscription service that provides customized support information, products tips, and feature articles based on subscriber profile</p> <ul style="list-style-type: none"> • E-mail Driver and Support Alerts/Notifications (available WW) <ul style="list-style-type: none"> ○ Proactive email information on drivers, software patches, product change notifications, and customer advisories on HP product lines ○ The Product Change Notification service provides information on hardware and software changes that will be implemented in manufacturing up to 60-days in advance • E-newsletters (available NA) <ul style="list-style-type: none"> ○ HP Technology at Work ○ SMB Promotional Newslette 	X	X	X
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	X	X	X
Remote Wakeup/ Remote Shutdown	<ul style="list-style-type: none"> • System administrators can power on, restart, and power off a client computer from a remote location. • Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM. 	X	X	X
ROM Based Setup (F10) and Start-up Diagnostics	--	X	X	X
Support Software CD & WWW	--	X	X	X

Other Features	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
ACPI-Ready Hardware	<p>Advanced Configuration and Power Management Interface (ACPI).</p> <ul style="list-style-type: none"> • Allows the system to wake from a low power mode. • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. 	X	X	X
SMBIOS	System Management BIOS, previously known as DMI BIOS, for system management information	X	X	X
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	X	X	X
Dual-State Power Button	Power button acts as both an on/off button and suspend-to-sleep button	X	X	X

Technical Specifications

Serviceability Features of System	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Dual Color Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)	--	X	X	X
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	X	X	X
System/Emergency ROM	Recovers corrupted system BIOS.	X	X	X
Flash Recovery with Video Configuration Record SW	--	X	X	X
Over-Temp Warning on Screen (Requires IM Agents)	--	X	X	X
OS CD (Restore OS CD)	Restores computer to its original factory shipping image	X	X	X
Restore CD	Restores the computer to its original factory shipping image	X	X	X
Flash ROM	--	X	X	X
5 Aux Power LED on System PCA	--	X	X	X
Dual Function 5V Aux Power LED (ON)/PS_ON LED (OFF) on System PCA	--	X	X	X
Diagnostic Power Switch LED on board	--	X	X	X
Clear Password Jumper	--	X	X	X
Clear CMOS Button	--	X	X	X
CMOS Battery Holder for easy Replacement	--	X	X	X
Processor ZIP Socket for easy Upgrade	--	X	X	X
DIMM Connectors for easy Upgrade	--	X	X	X
NIC LEDs (integrated) (Green & Amber)	Used to determine NIC status	X	X	X

Technical Specifications

Serviceability Features of Chassis	Description	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions	--	X	X	X
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments	X	X	X
Front power switch	--	X	X	X
Green Pull Tabs, and Quick Release Latches for easy Identification	--	X	X	X
Color coordinated cables and connectors		X	X	X
System memory can be upgraded without removing the system board or any internal components	Eases memory upgrading	X	X	X
Tool-less Hood Removal	Eases entry to the chassis without use of special tools	X (thumb screw)	X	X
Tool-less Hard Drive, CD & Diskette Removal	--	X	X	X
Tool-less System Board Removal	No special tools required for system board removal or maintenance	X	X	X
Towerable	Product can be oriented as a tower (in addition to desktop orientation)	X	X	X
Drive Self Tests (DPS)	<ul style="list-style-type: none"> • Drive Protection System • A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. 	X	X	X
DPS Access through F10 Setup during Boot	<ul style="list-style-type: none"> • 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. 	X	X	X
DPS Access through Diagnostics for Windows	<ul style="list-style-type: none"> • 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 	X	X	X
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	X	X	X
SMART I - Drive Failure Prediction	<ul style="list-style-type: none"> • Helps predict failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count 	X	X	X
SMART II - Off-Line Data Collection		X	X	X
SMART III - Off-Line Read Scanning with Defect Reallocation	<ul style="list-style-type: none"> • By helping to avoid actual hard drive failures, SMART hard drives may provide additional insurance" against unplanned user downtime and potential data loss from hard drive failure 	X	X	X

Technical Specifications

Service and Support	<p>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.</p>
	<p>NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply.</p>
	<p>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.</p>
	<p>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.</p>

Technical Specifications - Audio

AC97 Integrated ADI 1981B Audio	Type	Integrated
	AC '97 Stereo Codec	Yes
	FM Synthesis Support	Yes – Yamaha XG Lite
	OPL3 FM Synthesis Support	Yes
	Sound Blaster Compatibility	Yes
	Audio Jacks	Microphone-In (20-K ohm Input Impedance); rear stereo and front analog microphone ports available except for USDT which has front stereo microphone only Line-In (12-K ohm Input Impedance) Line-Out * (less than 800 ohms Output Impedance, expects at least a 10-K ohm load) Headphone-Out (2.5 Ohms Output Impedance, expects at least a 32 ohm load)
	NOTE: *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.	
	Sampling	7 kHz – 48 kHz
	Wavetable Syntheses (software)	Yes – GM and FM Midi Support, Direct Music and Down Loadable Soundset (4 Meg DLS Level 1 and 2 Support)
	3D Positional Sound	No
Digital Audio	Yes	
Analog Audio	Yes	
Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)	
Internal Audio Speaker Power Rating	3W	
Internal Speaker	Yes	
Hardware Equalizer for Internal Speaker	Fixed 7 Band ParametricEQ	
External Speaker Jack (Line-Out)	Yes	

Technical Specifications - Communications

Broadcom NetXtreme Gigabit Ethernet PCI-Express Adapter	Connector	RJ-45
	Controller	Broadcom 5751 PCI-Express LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E
	Data path width	Single channel, PCI-E
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	3.1 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Environmental	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
	Dimensions	4.4 x 2.2 x 0.08 in (11.2 x 5.5 x 2 cm)
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
	Alerting	N/A
	Kit contents	Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI-E Adapter, drivers, quick install guide, product warranty statement

Technical Specifications - Communications

Integrated Broadcom NetXtreme Gigabit Ethernet NIC	Connector	RJ-45
	Controller	Broadcom 5782 PCI LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1A, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI 2.2
	Data path width	32-bit, 33/66 MHz bus interface
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC class B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network Transfer Mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T, (full-duplex) 2000 Mbps
	Environmental	Operating temperature 32° to 131° F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
	Dimensions	4.7 x 2.0 x 0.08 in (12 x 5 x 1.9 cm)
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0
	Alerting	ASF 2.0

Intel Pro 1000 MT Gigabit NIC	Connector	RJ-45
	Controller	Intel 82540EM Gigabit Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1A, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI 2.3
	Data path width	32-bit, 33/66 MHz bus interface
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes

Technical Specifications - Communications

Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T, 1000 Mbps
Environmental	Operating temperature 32° to 131° F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
Dimensions	6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm)
Operating system driver support	Microsoft® Windows® NT® 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility

56K PCI SoftModem	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/ 9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU high speed 56K, ITU-T, V.34bis, V.22bis, V.22bis, V.21, V.23, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	Group3 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2, Class 1
	Error Correction and Data Compression	V.44 (software upgradeable), 4.2bis, V.42 and MNP2-5
	Power Management	APM and ACPI states D0, D1, D2, and D3; meets PCI 2.2 requirements and PC'99 requirements
	Upgradeability	Software driver upgradeable for high speed 56K modem and future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Operating System Support	Microsoft® Windows® 95 and 98, Microsoft Windows 98 SE, Microsoft Windows 2000, Microsoft Windows Me, Microsoft Windows NT® 4.0, and Microsoft Windows XP
	OS Driver Support	Microsoft Windows 95 and 98, Microsoft Windows 98 SE, Microsoft Windows 2000, Microsoft Windows Me, Microsoft Windows NT 4.0, Microsoft Windows XP
	Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load

Technical Specifications - Communications

Chipset	Agere Systems 1648C (Mars 3.2) – Integrated PCI interface with 5-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI low profile specifications – 6.7 x 2.3 in (17.0 x 5.8 cm) and supports high-and low-profile brackets
Connection	Dual, parallel RJ-11 support with auxiliary Tip/Ring connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, transformer-based DAA design, support for high profile and low profile brackets, PnP ID supports via external EEPROM
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in India, Russia, Slovakia, Slovenia, Belarus, Brunei, Croatia, Ecuador, Latvia, Lithuania, Morocco, Peru, Phillipines, Sri Lanka, Ukraine, Malaysia (use DC132B or DC132C instead)
Health	Bare PCB material compliant to 94V-0 or better (marked as such), Microsoft Windows Me health compliant
Other	PC'99 compliant, PCI version 2.2, WHQL approved; support for ACPI revision 1.1

Technical Specifications - Graphics

Integrated Graphics Media Accelerator 900	3D/2D Controller	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.
	VGA Controller	Integrated
	Bus Type	PCI Express™ x16 (Internal graphics is automatically disabled if an external 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).
	RAMDAC	Integrated, 400 MHz
	Memory	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 < 512 MB: 8 MB pre-allocated + 56 MB DVMT: max frame buffer of 64 MB 512 MB ≤ Memory: 8 MB pre-allocated + 120 MB DVMT : max frame buffer of 128 MB
	Controller Clock Speed	333 MHz
	Overlay Planes	Single overlay support with 5x3 filtering
	Maximum Color Depth	32 bits/pixel
	Maximum Vertical Refresh Rate	85 Hz at up to 1920x1440, 75Hz at 2048x1536. Varies with mode and configuration. See table below.
	Multi-display Support	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.
	Operating Systems	Microsoft Windows XP and Windows 2000
	Graphics/Video API Support	Microsoft DirectX®9, DirectXA®, VMR9, GDI/GDI+; OpenGL® 1.4.

Technical Specifications - Graphics

Resolutions Supported ¹	Resolution	Maximum Refresh Rate (Hz)	
		Analog Monitor	Digital Monitor
	640 x 480	85	70
	800 x 600	85	70
	1024 x 768	85	70
	1152 x 864	85	70
	1280 x 768	60	70
	1280 x 960	85	70
	1280 x 1024	85	70
	1600 x 900	60	70
	1600 x 1200	85	60
	1920 x 1080	60	-
	1920 x 1200	60	-
	1920 x 1440	75	-
	2048 x 1536	75	-

¹ 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.

NVIDIA Quadro NVS 280	Form Factor	ATX
Graphics Card	Graphic Controller	Integrated Quadro 280 2-D graphics processor unit (GPU)
	VGA controller	Integrated into the Quadro GPU
	Bus type	Workstations: AGP 8X or PCI Desktops: PCI
	RAMDAC	Dual 350 MHz
	Memory	64 MB DDR with frame buffer and Texture storage
	Connector	Single High-density Flex Connector
	Dimensions	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	Controller clock speed	275 MHz
	Color planes	32-bit color buffer
	Overlay planes	1 16-bit Video overlay plane
	Maximum vertical refresh rate	120 Hz
	Maximum pixel clock	350 MHz
	Multi-monitor support	Dual analog or digital monitors
	Single DVI Support	Yes
	Dual DVI Support	Yes
	High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling

Technical Specifications - Graphics

Available graphics drivers

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://welcome.hp.com/country/us/eng/software_drivers.html.

Analog Resolution	Maximum Colors Supported	Maximum Refresh Rate	Analog Resolution
640 x 480	16.7 M	240 Hz	640 x 480
800 x 600	16.7 M	240 Hz	800 x 600
1024 x 768	16.7 M	200 Hz	1024 x 768
1600 x 1200	16.7 M	170 Hz	1600 x 1200
1600 x 1200	16.7 M	150 Hz	1600 x 1200
1600 x 1200	16.7 M	100 Hz	1600 x 1200
1920 x 1200	16.7 M	85 Hz	1920 x 1200
1920 x 1200	16.7 M	85 Hz	1920 x 1200
1920 x 1440	16.7 M	75 Hz	1920 x 1440
2048 x 1536	16.7 M	60 Hz	2048 x 1536
Digital Resolution	Maximum Colors Supported	Maximum Refresh Rate	Digital Resolution
640 x 480	16.7 M	75 Hz	640 x 480
800 x 600	16.7 M	75 Hz	800 x 600
1024 x 768	16.7 M	75 Hz	1024 x 768
1152 x 864	16.7 M	60 Hz	1152 x 864
1280 x 1024	16.7 M	60 Hz	1280 x 1024
1600 x 1200	16.7 M	60 Hz (primary only)	1600 x 1200

Technical Specifications - Hard Drives

7200 rpm Serial ATA Hard Drives	40-GB	Capacity	40,020,000,000 bytes			
		Height	1 inch (2.54 mm)			
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)			
		Interface	Serial ATA			
		Synchronous Transfer Rate (Maximum)	150 MB/s			
		Buffer	2 MB			
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms		
			Average	8.5 ms		
			Full-Stroke	18.0 ms		
		Rotational Speed	7,200 rpm			
		Logical Blocks	78,165,360			
		Operating Temperature	41° to 131° F (5° to 55° C)			
			80-GB	Capacity	85,899,345,920 bytes	
				Height	1 in (2.54 cm)	
Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)					
Interface	Serial ATA					
Synchronous Transfer Rate (Maximum)	150 MB/s					
Buffer	8 MB					
Seek Time (typical reads, includes controller overhead, including settling)	Single Track			0.9 ms		
	Average			9.3 ms		
	Full-Stroke			18 ms		
Rotational Speed	7,200 rpm					
Logical Blocks	153,301,488					
Operating Temperature	41° to 131° F (5° to 55° C)					

Technical Specifications - Hard Drives

120-GB	Capacity	120,034,000,000 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA	
	Synchronous Transfer Rate (Maximum)	150 MB/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track 1.0 ms Average 8.5 ms Full-Stroke 18 ms	
	Rotational Speed	7,200 rpm	
	Logical Blocks	234,441,648	
	Operating Temperature	41° to 131° F (5° to 55° C)	
	160-GB	Capacity	171,798,691,840 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
Interface		Serial ATA	
Synchronous Transfer Rate (Maximum)		150 MB/s	
Buffer		8 MB	
Seek Time (typical reads, includes controller overhead, including settling)		Single Track 0.9 ms Average 9.3 ms Full-Stroke 18 ms	
Rotational Speed		7,200 rpm	
Logical Blocks		312,581,808	
Operating Temperature		41° to 131° F (5° to 55° C)	

Technical Specifications - Input/Output Devices

2004 Standard Keyboard (PS/2 or USB)	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC \pm 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	USB Type A plug connector
		ESD	CE level 4, 15-kV air discharge
		EMI - RFI	Conforms to FCC rules for a Class B computing device
	Mechanical	Microsoft® PC 99 - 2001	Functionally compliant
		Languages	38 available
Keycaps		Low-profile design	
Switch actuation		55-g nominal peak force with tactile feedback	
Switch life		20 million keystrokes (using Hasco modified tester)	
Switch type		Contamination-resistant switch membrane	
Key-leveling mechanisms		For all double-wide and greater-length keys	
Environmental	Cable length	6 ft (1.8 m)	
	Microsoft PC 99 - 2001	Mechanically compliant	
	Acoustics	43-dBA maximum sound pressure level	
	Operating temperature	50° to 122° F (10° to 50° C)	
	Non-operating temperature	-22° to 140° F (-30° to 60° C)	
	Operating humidity	10% to 90% (non-condensing at ambient)	
	Non-operating humidity	20% to 80% (non-condensing at ambient)	
	Operating shock	40 g, six surfaces	
	Non-operating shock	80 g, six surfaces	
	Operating vibration	2-g peak acceleration	
Operating system support	Non-operating vibration	4-g peak acceleration	
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence	
Approvals	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence	
	Operating system support	Windows® 2000 and Windows XP	
Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS		

Technical Specifications - Input/Output Devices

2-Button Scroll Mouse (PS/2 or USB)	Scroll Wheel	8 mm		
	Maximum Rotation Speed	30 mm/s		
	Switch Type	Light force micro-switch		
	Switch Life	1 million operations		
	Mechanical Life	Minimum 200,000 revolutions		
	Environmental	Operating Temperature	50° to 122° F (10° to 50° C)	
		Non-operating Temperature	-22° to 140° F (-30° to 60° C)	
		Operating Humidity	10% to 90% (non condensing at ambient)	
		Non-operating Humidity	20% to 80% (non condensing at ambient)	
		Operating Shock	40 g, 6 surfaces	
		Non-operating Shock	80 g, 6 surfaces	
		Operating Vibration	2 g peak acceleration	
		Non-operating Vibration	4 g peak acceleration	
		Electrical	Operating Voltage	+ 5VDC ± 10%
			Power Consumption	15mA
	System Consumption		PS/2 mini-din connector	
	ESD		CE level 4, 15 kV air discharge	
	EMI-RFI		Conforms to FCC rules for a Class B computing device	
	Mechanical		PC98	Functionally compliant
Resolution		400 ± 20% DPI		
Tracking Speed		10 in/s maximum		
Acceleration		100 in/s		
Switch Actuation		85 g nominal peak force		
Switch Life		1,000,000 operations (using Hasco modified tester)		
Cable Length		2 m		
Regulatory Approvals	PC98-99	Mechanically compliant		
		UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick		

Technical Specifications - Optical Storage

16X DVD+/-RW LightScribe Drive (Double Layer / Dual Format)	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	ATAPI/EIDE		
	Disc recording capacity	8.5 GB DL or 4.7 GB standard		
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	Weight (max)	2.6 lb (1.2 kg)		
	Write speed	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	
		Read speed	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	
	Access time (typical reads, including settling)		Random	DVD: < 130 ms (typical), CD: < 120 ms (typical)
			Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
		Startup Time	Single-session: < 15 seconds (typical), Multi-session: < 30 seconds (typical)	
		Stop Time	< 4 seconds	
Power	Cache Buffer	2 MB (minimum)		
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)		
	Source	DC Power Requirement	5 VDC \pm 5%-100 mV ripple p-p 12 VDC \pm 5%-200 mV ripple p-p	
		DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)	
			12 VDC (< 600 mA typical, 1400 mA maximum)	
	Total Drive Power (standby mode)	Line-Out	< 2.5 Watt	
		Signal-to-Noise Ratio	0.7 VRMS	
		Channel Separation	74 dB	
	Audio output	Signal-to-Noise Ratio	65 dB	
		Environmental conditions (operating - non- condensing)	Temperature	41° to 122° F (5° to 50° C)
Relative humidity			10% to 90%	
	Maximum wet bulb temperature	86° F (30° C)		

Technical Specifications - Optical Storage

System configuration	Intel PentiumIII 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
Operating systems support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home
Regulatory approvals	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1 153D, 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.
Option kit contents	16X DVD+/-RW LightScribe drive, LightScribe software, InterVideo WinDVD, InterVideo WinDVD Creator, Roxio Easy Media Creator 7, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media.

48X Max CD-ROM Drive	Interface	ATAPI IDE
	Data Buffer	16.6 Mbps
	Data Transfer Rate	Sustained—1200 Kbps Variable (CD)—3,000 to 7,200 Kbps minimum (audio)
	Disk Rotation Technology	CAV (Constant Angular Velocity)
	Access Time (ms)	Random: < 100 ms Full-stroke seek: < 150 ms
	Average Access Time	< 80 ms
	Cache Buffer	128 KB
	Cache Buffer (standard/maximum)	
	Disk Formats Read	Multi-session Photo CD, multi-read CD-ROM, CD text, audio CD, CD-I, CD-RW, CD-R, CD-Extra, CD-ROM XA
	Disk Formats Written	None
	Disk Capacity (CD)	650 MB
	Block Size	Mode 1 – 2,048, 2,352 bytes Mode 2-1, 2,088, 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
	Diameter	12 cm; 8 cm
	Thickness	1.2 mm
	Track Pitch	1.6 μm
	Audio Output Level	Line-out—0.7 V @ 47 Headphone—0.6 V @ 32 ohm Kohm
	Startup Time	< 7 seconds (typical); < 30 seconds with multi-session
	Operating Conditions	Temperature 41° to 120° F (5° to 50° C) Relative Humidity 10% to 80%
	Dimensions (H x W x D, maximum)	1.7 x 5.9 x 8.0 in (4.3 x 15.0 x 20.3 cm)
	Weight	2.6 lb (1200 g)
	MPEG Playback Graphics	None
	Solution Support	

Technical Specifications - Optical Storage

48X/32X/48X CD-RW Drive	Orientation	Either horizontal or vertical	
	Disc Loading Mechanism	Half-height, tray load	
	Interface Type	ATAPI IDE	
	Dimensions—external (W x H x D)	7.99 x 5.88 x 1.71 in (203 x 149.5 x 43.5 mm)	
	Weight	2.6 lb (1.2 kg)	
	Disc Diameter	12 cm, 8 cm	
	Disc Thickness	1.2 mm	
	Track Pitch	1.6 μ m	
	Disc Center Hole Diameter	15 mm	
	Reference Scanning Velocity	1.2 m/s	
	Recording/Playing Time	80 minutes with CD-R media	
	Read Only Disc Parameters	Formats and Modes Supported	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
		Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
		Block Size	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
	Writeable Disc Parameters	Disc Type	CD-R and CD-RW
		Write Methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
		Format and Modes Supported	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
	Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)	
	Block Size	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	
Access Times (typical)	Random	< 120 ms	
	Full Stroke	< 200 ms	
Maximum Data Transfer Rates	CD-RW Write	4800 KB/s (32X) Max	
	CD-ROM, CD-R read	7200 KB/s (48X) Max	
	CD-RW read	7200 KB/s (32X) Max	
	CD-R write	7200 KB/s (48X) Max	
Data Transfer Modes	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.		

Technical Specifications - Optical Storage

Cache Buffer	2 MB (minimum)			
Start-up Time (single)	< 7 seconds typical			
Start-up Time (multi-session)	< 30 seconds typical			
Stop Time	< 4 seconds			
Power	Source	Four-pin, DC power receptacle		
	DC power requirement	5 VDC \pm 5%—100 mV ripple p-p		
		12 VDC \pm 5%—200 mV ripple p-p		
	DC current	5 VCD	< 1A (typical)	< 1600 mA (maximum)
		12 VCD	< 600 mA (typical)	< 1.4A (maximum)
	Total Drive Power (Standby mode)	< 2.5 watt		
Audio Output Level	0.7 Vrms			
Configuration Jumper Block	Master, slave and cable select modes			
Data Interface Connector	50-pin IDE interface			
Environmental (all conditions, non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)		
	Relative Humidity (operating)	10% to 90%		
	Maximum Wet Bulb Temperature (operating)	84° F (29° C)		

16X/40X DVD-ROM	Height	5.25-in, half-height		
	Interface Type	ATAPI		
	Dimensions— External, Excluding Bezel (W x H)	5.88 x 1.71 in (149.5 x 43.5 mm)		
	Disc Diameter	12 cm, 8 cm		
	Disc Thickness	1.2 mm		
	Track Pitch	1.6 μ m (CD), 0.74 μ m (DVD)		
	Disc Center Hole Diameter	15 mm		
	Disc Formats	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 ; 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		
	Disc Capacity	DVD-ROM	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), 4.7 GB (DVD+R)	
		CD-ROM	40 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)	

Technical Specifications - Optical Storage

Block Size (bytes)	DVD-ROM – 2048; CD-ROM Mode 0 – 2352; CD-ROM Mode 1 – 2352, 2340, 2336, 2048; CD-ROM Mode 2 – 2352, 2340, 2336, 2048	
Access Times (typical reads, including settling)	DVD-ROM Single Layer	120 ms (typical)
	CD-ROM Mode 1	90 ms (typical)
	Full Stroke DVD	240 ms (seek) (typical)
	Full Stroke CD	160 ms (seek) (typical)
Maximum Data Transfer Rates	CD-ROM Read	6000 KB/s (40X) Max
	DVD-ROM Read	21,600 KB/s (16X) Max
Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)	
Power	Source	Four-pin, DC power receptacle
	DC Power Requirement	5 VDC \pm 5% – 100 mV ripple p-p
		12 VDC \pm 5% – 200 mV ripple p-p
	DC Current	5 VDC – <800 mA typical, < 1000 mA maximum
12 VDC – < 870 mA typical		
Audio Output Level	0.7 Vrms (typical)	
Configuration Jumper Block	Master, slave, and cable select modes	
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
Environmental (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 90%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)
Certifications, Approvals	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.	
Operating Systems Supported	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	
Kit Contents	16X/40X DVD-ROM Drive, Roxio CinePlayer software, and installation guide.	

48X/32X/48X/16X Combo CD-RW/DVD- ROM

	5.25-inch, half-height, tray-load
Color	Carbonite
Orientation	Either horizontal or vertical
Interface Type	ATAPI
Dimensions (W x H x D)	5.77 x 1.71 x 7.36 in (146.5 x 43.5 x 187 mm) (external, excluding bezel)
Disc Diameter	12 cm, 8 cm
Disc Thickness	0.05 in (1.2 mm)
Track Pitch	1.6 μ m (CD), 0.74 μ m (DVD)
Disc Center Hole Diameter	0.6 in (15 mm)

Technical Specifications - Optical Storage

Reference Scanning Velocity	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)	
Read Only Disc Parameters	Formats and Modes Supported	CD-ROM – Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD-Bridge; 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; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session , and DVD+RW
	Capacity	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10)
	Block Size	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
Writeable Disc Parameters	Disc Type	CD-R and CD-RW
	Write Methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	Format and Modes Supported	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; CD-Bridge; Video CD
	Capacity	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (mode 2, 12 cm)
	Block Size	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 – 1 ,048 and 2,352 bytes; mode 2, form 2 – 2,324 and 2,352 bytes
Access Times (typical reads, including settling)	Random DVD	< 140 ms (typical)
	Random CD	< 125 ms, (typical)
	Full Stroke DVD	< 250 ms (seek)
	Full Stroke CD	< 210 ms (seek)
Maximum Data Transfer Rates	CD-R write	7200 KB/s (48X) Max
	CD-RW write	1500 KB/s (10X) Max
	CD-ROM, CD-R, CD-RW read	7200 KB/s (48X) Max
	DVD ROM read	21,632 KB/s (16X) Max

Technical Specifications - Optical Storage

Data Transfer Modes	ATA PIO mode 4 (16.7 MB/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), mode 2 (33 MB/s); ATA UltraDMA Mode 3 44 Mbytes/s (default)
Cache Buffer	2 MB (minimum)
Startup Time (single)	< 7 seconds (typical)
Startup Time (multi-session)	< 30 seconds (typical)
Stop Time	< 4 seconds
Power Source	Four-pin, DC power receptacle
DC Power Requirement	5 VDC \pm 5%-100 mV ripple p-p 12 VDC \pm 5%-200 mV ripple p-p
DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum) 12 VDC (< 600 mA typical, < 1400 mA maximum)
Total Drive Power (standby mode)	< 2.5 Watt
Audio Output Level	0.7 Vrms (typical)
Configuration Jumper Block	Master, slave, and cable select modes
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon
Environmental (all conditions non-condensing)	Temperature (operating) 41° to 122° F (5° to 50° C) Relative humidity (operating) 10% to 90% Maximum wet bulb temperature (operating) 86° F (30° C)
Certifications, Requirements	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, and NT4
Operating Systems Supported	Microsoft Windows 2000, Microsoft Windows XP Professional, Microsoft Windows XP Home

16X DVD+/-RW Drive

5.25-inch, half-height, tray-load

Orientation	Either horizontal or vertical
Interface type	ATAPI/EIDE
Disc recording capacity	8.5 GB DL or 4.7 GB standard
Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)
Weight (max)	2.6 lb (1.2 kg)

Technical Specifications - Optical Storage

Write speed	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
Reads	DVD+R/-R/+RW/-RW	Up to 16X
	DVD-ROM	Up to 16X
	CD-R/RW	Up to 40X
Access time (typical reads, including settling)	Random	DVD: < 130 ms (typical), CD: < 120 ms (typical)
	Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	Startup Time	Single-session: < 7 seconds (typical), Multi-session: < 30 seconds (typical)
	Stop Time	< 4 seconds
	Cache Buffer	2 MB (minimum)
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
	Power	Source
DC Power Requirement		5 VDC \pm 5%-100 mV ripple p-p
		12 VDC \pm 5%-200 mV ripple p-p
DC Current		5 VDC (< 1000 mA typical, 1600 mA maximum) 12 VDC (< 600 mA typical, 1400 mA maximum)
Audio output	Total Drive Power (standby mode)	< 2.5 Watt
	Line-Out	0.7 VRMS
	Signal-to-noise ratio	74 dB
Operating environmental (all conditions non-condensing)	Channel separation	65 dB
	Temperature	41° to 122° F (5° to 50° C)
	Relative humidity	10% to 90%
System configuration	Maximum wet bulb temperature	86° F (30° C)
	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	
Operating systems support	Microsoft Windows 2000 and Windows XP	
Regulatory approvals	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.	
Option kit contents	16X DVD+/-RW drive, Roxio DigitalMedia Plus, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media.	

Technical Specifications - Removable Storage

HP Drive Key II	Dimensions (HxWxD)	0.32 x 0.63 x 2.67 in (0.8 x 1.6 x 6.8 cm)		
	Storage Capacity	256 MB		
	Weight	0.05 lb (0.02 kg)		
	Transfer Rates	Read	Capable of 6.0 MB/s sustained read speed in USB 2.0 system	
		Write	Capable of 6.0 MB/s sustained write speed in USB 2.0 system	
	Operating Temperature	41° to 122° F (5° to 50° C)		
	Non-operating Temperature	-22° to 140° F (-30° to 60° C)		
	Operating System Support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home. No driver is required for this device. Native support is provided by the operating system.		
	Option Kit Contents	HP Drive Key II, documentation		

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