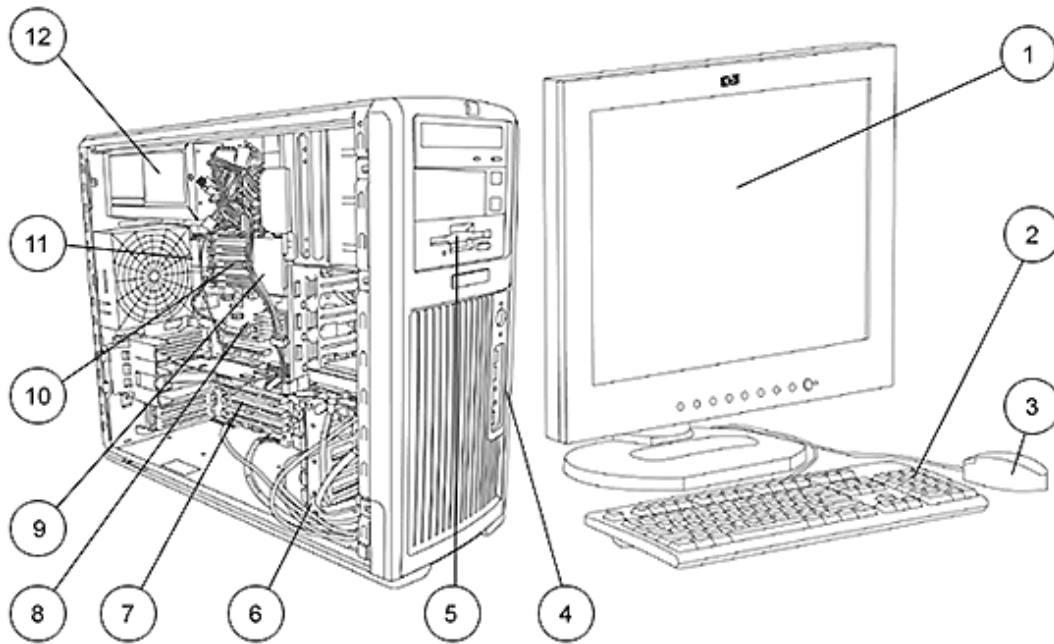


### Overview



1. Monitor (sold separately)
2. 2004 Standard Keyboard
3. 2-Button Scroll Mouse
4. Front IO: 2 USB 2.0, IEEE-1394 (standard), headphone and microphone
5. 5.25" external bay for optional diskette drive, optical drive or other 5.25"/3.5" device
6. 5 internal 3.5" bays, 3 external 5.25" bays
7. 2 PCI, 3 PCI-X, 1 PCI Express slots
8. 1 PCI Express x16 Graphics Bus
9. Dual Intel® Xeon™ processors
10. 8 DIMM slots for DDR-2 memory
11. 6 USB 2.0, 1 standard serial port, 1 parallel port, 2 PS/2, 1 RJ-45, audio in/out, microphone
12. 600 watt power supply

### At A Glance

- Intel® Xeon™ processors with EM64T technology
- Choice of operating systems:
  - Microsoft Windows XP Professional
  - Red Hat Enterprise Linux Workstation 3.0
  - HP Linux Installer Kit (see <http://www.hp.com/workstations/software/linux/> for details)
- Up to 16 GB of DDR-2 memory
- PCI-Express I/O and graphics
- Integrated Intel NetXtreme Gigabit ethernet
- 800 MHz processor front side bus support, depending on processor
- Intel Hyper-Threading technology support
- SATA and Ultra 320 SCSI drives
- Digital AC97 integrated audio with internal speaker
- Pre-loaded Manageability tools
- 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.

### Standard Features - Custom Components

<b>Processor and Speed</b> – One of the following	<b>Intel Xeon Processor</b> with 800 MHz Front Side Bus, 1 MB L2 cache 2.8 GHz 3.0 GHz 3.2 GHz 3.4 GHz 3.6 GHz <b>2nd Intel Xeon Processor</b> with 800 MHz Front Side Bus, 1 MB L2 cache 2.8 GHz 3.0 GHz 3.2 GHz 3.4 GHz 3.6 GHz
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<b>Operating System</b> – One of the following	Microsoft Windows XP Professional SP1a Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit available as pre-load, 32 & 64-bit available as an After Market Option) HP Installer CD for Red Hat Linux 7.2, 7.3 and Workstation 3 Box Set (32bit and 64 bit) See <a href="http://www.hp.com/workstations/software/linux/">http://www.hp.com/workstations/software/linux/</a> . Click on "Hardware support matrix" under "Related links" for details.
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<b>1st Hard Disk Drive</b> – One of the following	40 GB 7200 rpm Serial ATA drive (2 MB cache) 80 GB 7200 rpm Serial ATA drive (8 MB cache) 160 GB 7200 rpm Serial ATA drive (8 MB cache) 250 GB 7200 rpm Serial ATA drive (8 MB cache) 400 GB 7200 rpm Serial ATA drive (8 MB cache) 74 GB 10K rpm Serial ATA drive (8 MB cache) 73 GB 10K Ultra320 SCSI drive 300 GB 10K Ultra320 SCSI drive 36 GB 15K Ultra320 SCSI drive 73 GB 15K Ultra320 SCSI drive 146 GB 15K Ultra320 SCSI drive
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<b>2nd Hard Disk Drive</b> – One of the following	2nd hard drive, 40 GB 7200 rpm Serial ATA drive (2 MB cache) 2nd hard drive, 80 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 160 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 250 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 74 GB 10K rpm Serial ATA drive (8 MB cache) 2nd hard drive, 73 GB 10K Ultra320 SCSI drive 2nd hard drive, 300 GB 10K Ultra320 SCSI drive 2nd hard drive, 36 GB 15K Ultra320 SCSI drive 2nd hard drive, 73 GB 15K Ultra320 SCSI drive 2nd hard drive, 146 GB 15K Ultra320 SCSI drive
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### Standard Features - Custom Components

<b>3rd Hard Disk Drive –</b> One of the following	3rd hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) 3rd hard drive, 74 GB 10,000 rpm Serial ATA drive (8 MB cache) 3rd hard drive, 73 GB 10K Ultra320 SCSI drive 3rd hard drive, 300 GB 10K Ultra320 SCSI drive 3rd hard drive, 36 GB 15K Ultra320 SCSI drive 3rd hard drive, 73 GB 15K Ultra320 SCSI drive 3rd hard drive, 146 GB 15K Ultra320 SCSI drive
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<b>4th Hard Disk Drive –</b> One of the following	4th hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) 4th hard drive, 74 GB 10,000 rpm Serial ATA drive (8 MB cache) 4th hard drive, 73 GB 10K Ultra320 SCSI drive 4th hard drive, 300 GB 10K Ultra320 SCSI drive 4th hard drive, 73 GB 15K Ultra320 SCSI drive 4th hard drive, 146 GB 15K Ultra320 SCSI drive
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<b>5th Hard Disk Drive –</b> One of the following	5th hard drive, 73 GB 10K Ultra320 SCSI drive 5th hard drive, 300 GB 10K Ultra320 SCSI drive 5th hard drive, 73 GB 15K Ultra320 SCSI drive 5th hard drive, 146 GB 15K Ultra320 SCSI drive
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<b>Drive controllers</b>	Integrated serial ATA controller Integrated dual channel Ultra320 SCSI controller with RAID (0 or 1) capability Optional Ultra 320 SCSI controller – basic Optional Ultra 320 SCSI controller – advanced, with RAID support and external connector Cable, 5 Part SCSI (required if 1st drive is SATA and any of the other drives are SCSI) Ultra320 back panel connect (uses HDCL connectors) Optional PCI SATA/150 Controller (SATA controller card required for 3rd and 4th SATA HDD, no SCSI drives allowed if ordered)
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<b>Memory –</b> One of the following	512 MB DDR-2 PC3200 (400 MHz) ECC Registered (2 x 256 MB) 1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 512 MB) 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1 GB) 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 512 MB) 3 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (6 x 512 MB) 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (8 x 512 GB) 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 1 GB) 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 2 GB) 6 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (6 x 1 GB) 8 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (8 x 1 GB) 16 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (8 x 2 GB)
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### Standard Features - Custom Components

**Removable Storage**

- 1.44-MB Diskette Drive
- 48X CD-ROM Drive
- 48X/32X/48X CD-RW Drive
- 16X/40X DVD-ROM drive
- 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive
- 16X DVD+/-RW, Dual-Layer (Win and RHWS3)

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**2nd Removable Storage**

- 48X/32X/48X CD-RW Drive
- 16X/40X DVD-ROM drive
- 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive
- 16X DVD+/-RW, Dual-Layer (Win and RHWS3)

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**Keyboard –**  
One of the following

- PS/2 Standard Keyboard
- USB Standard Keyboard

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**Mouse –**  
One of the following

- PS/2 2-Button Scroll Mouse
- PS/2 3-Button Mouse
- USB 2-Button Optical Scroll Mouse
- USB 3-Button Optical Mouse

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**Audio**

- Integrated Digital AC97 audio with internal speaker
- Sound Blaster Audigy 2 ZS PCI

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**NIC**

- Integrated Intel Pro MT 10/100/1000 LAN
- Broadcom 5782 10/100/1000 (PCI)
- Broadcom BCM5751 NetXtreme™ Gigabit Ethernet Controller (PCI-E)

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**Graphics**

- NVIDIA Quadro NVS 280 PCI Express (64 MB, VGA & DVI)
- NVIDIA Quadro FX 330 PCI Express (64 MB)
- ATI FireGL V3100 PCI Express (128 MB)
- NVIDIA Quadro FX 540 PCI Express (128 MB)
- NVIDIA Quadro FX 1300 PCI Express (128 MB)
- NVIDIA Quadro FX 1400 PCI Express (128 MB)
- ATI FireGL V5100 PCI-Express (128 MB)
- NVIDIA Quadro FX 3400 PCI Express (256 MB)

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**Miscellaneous**

- Hood intrusion sensor
- Trusted Platform Module

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**Software**

- Symantec Norton AntiVirus 2004 (optional)\*
- HP Performance Tuning Framework\*
- Altiris Recovery\*
- HP Client Manager Software v6.0\*

*\*Not available with a Linux Operating System*

### Standard Features - Specs

Operating System (choice)	Microsoft Windows XP Professional SP1 a	
	OR Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit only)	
	OR HP Installer Kit for Linux (includes drivers for both 32-bit & 64-bit OS versions on HP xw8200, xw6200 and xw4200 Workstations)	
Form factor	Minitower	
Color	Carbonite/Alloy metallic	
System Board Form Factor	E- ATX (12" x 13")	
Processor	Single or dual Intel Xeon processors (Nocona) with EM64T and Hyper-Threading Technology	
CPU Bus Speed Supported	800 MHz FSB	
Standard L2 Cache	1 MB L2 cache (non ECC)	
Chipset	Intel Tumwater	
Memory Expansion Slots	8 DIMM's	
Memory Type Supported	DDR-2 (ECC registered)	
Memory Speed Supported	DDR-2 Synch DRAM PC2-3200 (400 MHz) Registered ECC	
Maximum Memory	8 GB (8 DIMMs slots with 1 GB DIMMS)	
Network controller	Integrated Intel Pro MT 10/100/1000 LAN	
Audio	Integrated AC'97 digital audio with S/PDIF 6-channel pass-through, stereo microphone, and Yamaha XG Lite Softsynth support	
PCI slots	2 full-length PCI slots (3 full-height PCI-X slots (one 133 MHz, two 100 MHz slots) 1 PCI Express (x8 mechanically, x4 electrically) 1 PCI Express x16 graphics	
AGP slot	None	
Bays	Total Bays = 8	
Internal Bays	<ul style="list-style-type: none"> <li>● Five 3.5 inch bays (4 with acoustic dampening rail assemblies)</li> </ul>	
External Bays	<ul style="list-style-type: none"> <li>● Three 5.25 inch full length 2003 mm maximum device depth (top bay is limited to 198 mm depth when optional smart cover solenoid lock is installed. Bottom bay can be converted to an internal 3.5" 3rd Hard Drive bay using optional bracket</li> <li>● Floppy drive bay using optional bracket</li> </ul>	
Parallel Port	1	
Serial Port	1	
Front I/O	2 USB 2.0, Headphone, Microphone, IEEE 1394	
Rear I/O	6 USB 2.0, 1 standard serial port, 1 parallel port, PS/2 keyboard and mouse, 1 RJ-45 to integrated Gigabit LAN, Audio In, Audio Out, Mic In	
USB Keyboard	Optional	
USB Mouse	Optional	
PS/2 Keyboard	1	
PS/2 Mouse	1	
Chassis Dimensions (H x W x D)	17.9 x 8.3 x 20.7 in (45.4 x 21.0 x 52.5 cm)	
System weight	Minimum config – 42 lb (19 kg) Standard config – 45 lb (20 kg) Maximum config – 54 lb (24 kg)	
Shipping weight	Standard config – 54 lb (24 kg)	
Temperature	Operating	40° to 95° F (5° to 35° C)
	Non-operating	-40° to 140° F (-40° to 60° C)
Humidity	Operating	8% to 85%
	Non-operating	8% to 90%
Maximum Altitude (nonpressurized)	Operating	10,000 ft (3,000 m)
	Non-operating	30,000 ft (9,100 m)
Power Supply	600W wide-ranging, active Power Factor Correction	
Interfaces Supported	2 SATA interface (2 serial-ATA connectors), 2 Ultra320 SCSI interface, 2 EIDE interface (2 EIDE connectors) supported for optical drives, optional multi-bay interface	
Hard Drive Controller (PCI) Supported	Ultra160 or Ultra320, or SATA RAID, or Ultra320 RAID	

## Standard Features - Specs

Preinstalled Software
HP Performance Tuning Framework*
HP Client Manager Software v6.0*
Altiris Local Recovery*
Alert Standard Format specification*
CD/DVD software dependent on optical drive choices
* Not available on Linux

### After-Market Options

<b>Processors</b>	<b>2nd Intel Xeon™ processor with EM64T extensions and Hyper-Threading</b>	
	Intel Xeon processor at 2.8 GHz with 800 MHz FSB & 1 MB of L2 cache	DY665A
	Intel Xeon processor at 3.0 GHz with 800 MHz FSB & 1 MB of L2 cache	DY666A
	Intel Xeon processor at 3.2 GHz with 800 MHz FSB & 1 MB of L2 cache	DY667A
	Intel Xeon processor at 3.4 GHz with 800 MHz FSB & 1 MB of L2 cache	DY668A
	Intel Xeon processor at 3.6 GHz with 800 MHz FSB & 1 MB of L2 cache	DY669A

<b>Graphics</b>	<b>Multi display solutions</b>	<b>PCI</b>	<b>PCI-Express</b>	
	NVIDIA Quadro NVS 280 (64 MB, VGA & DVI)	X		AA932A
	NVIDIA Quadro NVS 400 (64 MB, quad head, VGA & DVI)	X		AA605A
	Quadro NVS 400 DVI cables	NA		AA606A
	NVIDIA Quadro NVS 280 PCI-E (64 MB, VGA & DVI)		X	DY650A
	DMS-59 to Dual DVI Cable for NVS cards	X	X	DL139A
	NVIDIA Quadro FX 330 (64 MB)		X	PB332A
	ATI FireGL V3100 (128 MB)		X	PE949A
	NVIDIA Quadro FX 540 (128 MB)		X	PH791A
	NVIDIA Quadro FX 1300 (128 MB)		X	PB331A
	NVIDIA Quadro FX 1400 (128 MB)		X	PM979A
	ATI FireGL V5100 (128 MB)		X	PB330A
	NVIDIA Quadro FX 3400 (256 MB)		X	PB329A

<b>Hard Drives</b>	<b>SATA Hard Drives</b>	
	40 GB SATA/150 Hard Drive (7200 rpm)	PB371A
	80 GB SATA/150 Hard Drive (7200 rpm)	DE705A
	160 GB SATA/150 Hard Drive (7200 rpm)	DE706A
	250 GB SATA/150 Hard Drive (7200 rpm)	DS702A
	400 GB SATA/150 Hard Drive (7200 rpm)	PM254A
	74 GB SATA/150 Hard Drive (10,000 rpm)	DX760A
	<b>SCSI Hard Drives</b>	
	73 GB Ultra320 SCSI Hard Drive (10,000 rpm)	AA613A
	300 GB Ultra320 SCSI Hard Drive (10,000 rpm)	DY672A
	36 GB Ultra320 SCSI Hard Drive (15,000 rpm)	AA616A
	73 GB Ultra320 SCSI Hard Drive (15,000 rpm)	AA617A
	146 GB Ultra320 SCSI Hard Drive (15,000 rpm)	DY671A
	Bracket HDD 3.5 to 5.25	AA833A
	Cable, 5-port SCSI 8200	AA818A
	U320 SCSI Back Panel connector (Uses HDCI, HD68, or mini DB68 connectors)	AA658A

<b>Controllers</b>	<b>SCSI Controllers</b>	<b>PCI</b>	<b>PCI-Express</b>	
	U320 SCSI Controller, RAID 0,1 & ext conn	X		DZ554A
	Ultra320 SCSI RAID Adaptec 2120S (Windows only)	X		AA850A

### After-Market Options

<b>Input/Output Devices</b>	<b>Keyboards</b>		
	HP PS/2 Standard Keyboard (Carbonite/Silver)		DT527A
	HP USB Standard Keyboard (Carbonite/Silver)		DT528A
	HP USB 2004 Modular keyboard		DT530A
	Smartcard adapter for modular keyboard		DT531A
	<b>Pointing Devices</b>		
	HP PS/2 2-Button Scroll Mouse (Carbonite)		DD440B
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)		DC172B
	HP PS/2 3-Button Mouse		AA778A
	HP USB Optical 3-button mouse		DY651A
	USB Spaceball 5000		DV675A
	USB SpaceMouse		DZ203A

<b>Networking</b>	<b>NICs</b>	<b>PCI</b>	<b>PCI-Express</b>		
		Intel Pro/1000MT	X		DC193A
		HP Gigabit by Broadcom (BCM5782)	X		DC194A
		Broadcom BCM5751 NetXtreme™ Gigabit Ethernet Controller (PCI-E)		X	DZ556A

<b>Memory (DIMMs)</b>	<b>400 MHz DDR-2 PC2-3200 ECC Registered DIMMs</b>		
	256 MB DDR-2 PC2-3200 (400 MHz) ECC Registered		DY656A
	512 MB DDR-2 PC2-3200 (400 MHz) ECC Registered		DY658A
	1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered		DY655A
	2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered – available winter 2005		PH201A

<b>Monitors</b>	<b>TFTs</b>		
	HP TFT L2335 (23-inch)		P9615W#
	HP TFT L2035 (20.1-inch)		P9614W#
	HP TFT L1955 (19.1-inch)		PD974A5
	HP TFT L1755 (17-inch)		PL777AA
	<b>CRTs</b>		
HP P1230 (22-inch)		P9613A	

<b>Optical Drives</b>	<b>DVD-ROM Drive</b>		
	16X/40X DVD-ROM w/ +R read		AA620A
	<b>CD-ROM Drive</b>		
	48X Max CD-ROM Drive		DC143B
	<b>CD-RW Drive</b>		
	48X/32X/48X CD-RW Drive		DE205A
	<b>Combo Drive</b>		
	48X/32X Combo DVD-ROM/CD-RW Drive		DE206A
<b>DVD+/-RW Drive</b>			
16X DVD+/-RW, Dual-Layer (Win and RHWS3)		PH205A	



### After-Market Options

<b>Removable Storage</b>	256 MB USB 2.0 II drive key	PH657A
	1.44 MB Internal Floppy Drive	DY670A
	HP DAT24i Internal DDS3 tape drive	C1555D
	HP 1.44MB Internal floppy drive	DY670A
	HP DAT24e External DDS3 tape drive	C1556D
	HP DAT40i Internal DDS4 tape drive	C5686B
	HP DAT40e External DDS4 tape drive	C5687C
	HP DAT72i Internal DAT72 tape drive	Q1522A
	HP DAT72e External DAT72 tape drive	Q1523A
<b>Security</b>	Chassis clamp lock, universal, no cable	DE817A
	Chassis clamp lock, universal, with cable	DE818A
<b>Brackets/Stand</b>	xw8200 slide rack kit IT/Broadcast	DY664A
	Fixed Rack Kit (IT/Broadcast)	AA640A
	Depth Adjustable Rails (stationary)	332558-B21
	Sliding Shelf kit	234672-B21
	Fixed shelf kit	253449-B21
<b>Other Devices</b>	IDE Cable Kit xw62/82 (2nd)	DY660A
	Front Card Guide and Fan Kit	DY648A
<b>Operating Systems</b>	Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit)	PD862A
	Red Hat Enterprise Linux Workstation 3 Update 2 (64-bit)	PD863A
<b>Software</b>	HP Remote Graphics V2 LTU for HP WS	PE672A
	HP Remote Graphics V2 LTU for non-HP – available winter 2005	PE673A
	HP Remote Graphics V2 Receiver LTU	PE674A
	HP Remote Graphics V2 software media	PE675A
	HP Remote SW for HP 1 year Update Subscription	PN680A
	HP Remote SW for non-HP 1 year Update Subscription – available winter 2005	PN681A
	HP Remote SW Receiver 1 year Update Subscription	PN682A

## Memory

### E7525 chipset

#### DDR-2 SDRAM ECC REGISTERED MEMORY

Memory must be added in pairs. This chart does not represent all possible memory configurations. The Intel E7525 chipset supports ECC Registered 400 MHz (PC2-3200) DDR-2 memory only.

DIMM socket 1 is the furthest from the Memory Controller Hub at the top of the board. Additional DIMM slots should be populated consecutively; socket 2, 3, 4, etc. Speed mixing of memory DIMMs is not allowed. For efficient dual-channel performance, each pair of DIMMs must be same size and same DRAM technology. If mixing single sided and double sided memory, load the double sided DIMM pairs first. ECC Registered memory must be used. If you have unused slots within a channel, chose the sockets closest to the memory controller (e.g. Sockets 7 & 8, then 5 and 6, and so on).

#### MAXIMUM MEMORY

Supports up to 16 GB of DDR SDRAM.

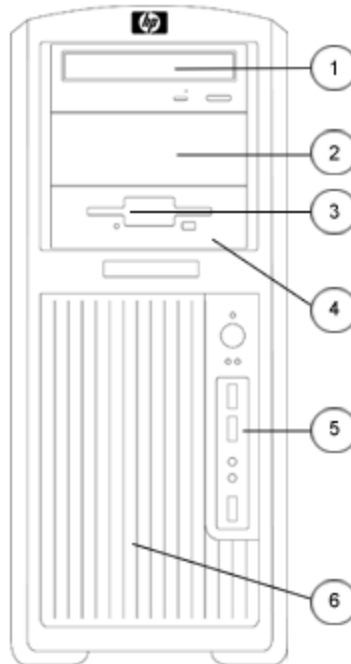
#### POSSIBLE MEMORY CONFIGURATIONS

Not all memory configurations possible are represented below.

DIMM Size	Slot							
	1	2	3	4	5	6	7	8
256 MB								
512 MB								
512 MB	256 MB	256 MB						
1 GB								
1 GB	512 MB	512 MB						
1 GB								
2 GB	1 GB	1 GB						
2 GB	512 MB	512 MB	512 MB	512 MB				
4 GB	1 GB	1 GB	1 GB	1 GB				
4 GB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
6 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB		
8 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
16 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB

## Storage

Tower configuration



### Convertible Minitower

- Optional Diskette Drive
- 5.25" Storage Drive Bays
- 3.5" Storage Drive Bays with acoustic dampening rail assemblies

	Quantity Supported	Position Supported	Controller
Optional Diskette Drive	1	3	Diskette
5.25" Storage Drive Bays	3	1, 2, 3	IDE
3.5" Storage Drive Bays with acoustic dampening rail assemblies	5	4, 5, 6, 7, 8	SATA or SCSI

SCSI and SATA may be mixed in a Windows configuration, only the primary drive may be SATA. SATA controller card required for 3rd and 4th SATA HDD; If SATA controller is ordered then no SCSI HDDs allowed; Linux does not support SATA controller or mixing SATA and SCSI drives.

### Additional Technical Specifications

System Board	
Architecture	Xeon EM64T/PCI-E
Chipset	Intel E7525/ICH5R Chipset
Super I/O Controller	SMSC LPC47B397
System Board Form Factor	E-ATX (12" x 13")
Processor Socket	Dual 604 Pin ZIF
DIMM Connectors (DDR2, 1.8V)	4
AGP Connector (1.5V)	None
Integrated Graphics	None
PCI Connectors (5.0V)	2 full length 33 MHz 32-bit
PCI-X Connectors	2 full length 100 MHz 64-bit 1 full length 133 MHz 64-bit
PCI card guide	Optional, tool-free support for all full-length cards with PCI extender
Flash ROM	Yes
AC97 integrated audio	Yes
CD ROM IN (Audio)	Yes
AUX IN (Audio)	Yes
Clear CMOS Button	Yes
CPU Fan Header	Yes
Chassis Fan Header	Yes
Chassis Speaker Header	Yes
CMOS Battery Holder – Lithium	Yes
Hood Lock Header	None
Hood Sensor Header	None
Multibay Header	Yes
Hard drive acoustic dampening rails	Standard in 4 internal 3.5" bays, tool-free
Integrated SATA RAID	<ul style="list-style-type: none"> <li>● RAID 0 and RAID 1</li> <li>● Supports one RAID array on 2 ports</li> <li>● Creation of 2 drive HDD array</li> </ul>
Integrated Intel Gigabit Ethernet	Yes
Wake-On-Lan®	Yes
ASF 1.0 (Alert Standard Format)	Will be provided in a BIOS upgrade
Power Supply Header	Yes
Power Switch, Power LED & Hard Drive LED Header	Yes
Password Clear Header	Yes
Riser Connector	None
HDD activity LED Header	Yes
PCI extender that connects to System Board	None

## Technical Specifications

<b>Cooling</b>	
Cooling Solutions Supported	Yes
Power Supply Fan	92 x 25 mm
Processor Fan-Heatsink	70 x 15 mm
Chassis Fan (front)	One 92 x 25 mm (optional)
Chassis Fan (rear)	One 120 mm x 28 mm (standard)
Internal Speaker	Standard

<b>Power Supply</b>	
Full Ranging Input	Yes
Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS)	Yes
Passive Power Factor Correction (PFC)	No
Operating Voltage Range	90 – 264 VAC/118 VAC
Rated Voltage Range	100 – 240 VAC
Rated Line Frequency	50-60 Hz/400Hz
Operating Line Frequency Range	47 – 66 Hz/393 – 407Hz
Rated Input Current	10A/8.6A
Maximum Rated Power	600 W
Heat Dissipation	Typical 1206.2 btu/hr Maximum 2047.4 btu/hr
PS Size (wide x high x deep)	92mm variable speed
Energy Star Compliant	Yes
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000V
Typical configuration power consumption	2 processors (2x3.6GHz Xeon), 1 GB memory (2x512 MB) Two hard drives (2xSATA 40 GB), DVD-ROM drive PCI-Express Graphics Card (FX 1300) Floppy, Monitor
	<b>Input Power consumption @ 120Vac/60Hz</b>
Typical operating mode (system busy)	353.5W = 1206.2 btu/hr
Windows XP Idle	210.3 W = 717.6 btu/hr
Hibernate mode (S4)	5.9 W = 20.1 btu/hr
Power Off (S5)	5.9 W = 20.1 btu/hr

## Technical Specifications

ROM Features	Description
Instantly Available PC	Allows for very low power consumption with quick resume time
ROM Based F10 Setup and diagnostics	Review and customize BIOS settings
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
System/Emergency ROM Flash Recovery with Video	Recovers corrupted system BIOS
ROM revision levels	<ul style="list-style-type: none"> <li>Identifies system ROM revision levels and reports in ROM-based F10 setup</li> <li>Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information</li> </ul>
System board revision level	<ul style="list-style-type: none"> <li>Allows management SW to read the revision level of the system board</li> <li>Revision level is digitally encoded into the hardware and cannot be modified</li> </ul>
Auto Setup when New Hardware Installed	System automatically detects addition of new hardware
Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control	Enable or disables serial, parallel, USB, audio, and network ports
Removable Media Write/Boot Control	Prevents ability to boot from removable media on supported devices (and can disable writes to media)
Power-On Password	Prevents an unauthorized person from booting up the computer
Setup Password	Prevents an unauthorized person from changing the system configuration
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
Memory Change Alert (Requires HP Client Manager Software)	Alerts management console if memory is removed or changed
Thermal Alert (Requires HP Client Manager Software)	<p>Monitors the temperature state within the chassis. Three modes:</p> <ul style="list-style-type: none"> <li>NORMAL – normal temperature ranges</li> <li>ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown</li> <li>SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs</li> </ul>
Master Boot Record Security	Detects changes to MBR and optional restoration, useful in protecting from viruses
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
Remote Wakeup/shutdown	<ul style="list-style-type: none"> <li>System administrators can power on, restart, and power off a client computer from a remote location.</li> <li>Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM</li> </ul>
ACPI (Advanced Configuration and Power Interface)	<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> <p>Supports ACPI 2.0 for full compatibility with 64-bit operating systems</p>
Keyboard-less Operation	The system can be operated without a keyboard
SMBIOS	System Management BIOS 2.3.5, previously known as DMI BIOS, for system management information
Localized ROM Setup	Common BIOS image supports configuration (Setup) in 11 languages, with local keyboard mappings
Asset tag	Allows user or MIS to set unique tag string in ROM
Ownership tag	Allows user or MIS to set unique tag string in ROM
Memory Scrubbing	Allows memory controller to transparently correct transient ECC errors in the background
Memory Remapping	Allows system memory lost to PCI devices to be reclaimed above 4 GB, for use with operating systems that support more than 4 GB (Windows XP 64-bit edition, Linux)
Per-slot control	Allows individual slot configuration (option ROM., latency)
Adaptive cooling	Fan control parameters are set according to detected hardware configuration for optimal acoustics
Pre-boot diagnostics	Early (pre-video) critical errors are reported via beeps and blinks on the power LED

### Technical Specifications

<b>Other deployment &amp; management features</b>	
HP Client Management Solutions	<p>HP Client Management Solutions help simplify management of Workstations 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.</p> <p>HP Client Manager Software is included free with all HP business PCs and Workstations. It enables central tracking, monitoring, and management of the hardware aspects of HP client systems:</p> <ul style="list-style-type: none"> <li>● Get valuable hardware information such as CPU, memory, video, and security settings</li> <li>● Monitor system health to fix problems before they occur</li> <li>● Install drivers and BIOS updates without visiting each PC</li> <li>● Remotely configure BIOS and security settings</li> <li>● Automate processes to quickly resolve hardware problems</li> </ul> <p>Additional Altiris solutions (fee-based) are available to address Workstation management challenges through the entire IT lifecycle including:</p> <ul style="list-style-type: none"> <li>● Inventory assessment</li> <li>● Software license compliance</li> <li>● Personality migration</li> <li>● Software image deployment</li> <li>● Software distribution</li> <li>● Asset management</li> <li>● Client backup and recovery</li> <li>● Problem resolution</li> </ul> <p>Visit <a href="http://www.hp.com/go/easydeploy">http://www.hp.com/go/easydeploy</a> for more information, to download HP Client Manager Software, and to evaluate the Altiris solutions.</p>
System Software Manager (free)	A free utility that detects and updates BIOS, device drivers, and management agent versions on your networked PCs and workstations
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
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
Software Restore CD	Restores computer to its original factory shipping image
Asset Tag	<ul style="list-style-type: none"> <li>● Repository for storing company-specific property asset numbers for easy tracking</li> <li>● Initially set equal to the system serial number</li> <li>● Stored in a protected section of non-volatile memory that can be accessed and modified with the F10 Setup program</li> </ul>
DIMM Serial Presence Detect	Detects whether or not memory DIMMs are present and their type
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
Memory Change Alert (Requires HP Client Manager Software)	Alerts management console if memory is removed or changed
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen
Ultra ATA Integrity Monitoring (CRC Checking)	<p>A feature of SATA and SCSI, Cyclic Redundancy Checking 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"> <li>● single bit errors</li> <li>● double bit errors</li> <li>● an odd number of errors</li> <li>● error bursts up to 32-bits long</li> </ul>
Drive Self Tests (DPS)	<ul style="list-style-type: none"> <li>● Drive Protection System (Adaptec and LSI SCSI controllers do not offer DPS)</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> </ul> <p>Running independently of the operating system, it can be accessed through the computer's setup procedure. It</p>

## Technical Specifications

	<p>produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced.</p> <p>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.</p> <p>DPS Access through F10 Setup during Boot (F10 diagnostic access not available with SCSI drives)</p>
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	<p>Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted</p> <p>Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count.</p> <p>By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure.</p> <p>SMART I – Drive Failure Prediction</p> <p>SMART II – Off-Line Data Collection</p> <p>SMART III – Off-Line Read Scanning with Defect Reallocation</p>

Security Features	
Access panel key lock (standard)	Prevents removal of the access panel and all internal components including optical and floppy drives
Padlock (optional)	Prevents entire system theft and discourages access panel removal. 7mm diameter padlock loop at rear of system.
Kensington Cable Lock (optional)	Prevents entire system theft only. 3mm x 7mm slot at rear of system.
Universal chassis clamp lock (optional)	The version without a cable discourages access panel removal and prevents theft of IO devices. The version with a cable additionally prevents entire system theft and allows multiple systems to be secured with a single cable.



## Technical Specifications

Serviceability Features of System	
Access panel	Tool-less, one-handed
Optical drives	Tool-less
Floppy drive	Tool-less
Hard drives	Tool-less
Expansion cards	Tool-less
Green user touch points	Yes, on tool-free internal chassis mechanisms
Color-coordinated cables and connectors	Yes
Memory	Tool-less, can be upgraded without removing any internal components
CPUs	Tool-less, can be upgraded without removing any internal components
Chassis fan removal	Tool-less
Power supply diagnostic LED	Yes, dual function: AC OK & power OK
Power Button	Yes, ACPI multi-function
Power LED	Yes, dual color LED indicates normal operation and faults.
Hard drive activity LED	Yes
Internal speaker	Yes, used for pre-boot diagnostic beep codes
Dual Color Power and HD LED on Front of Computer (Indicates Normal Operations and Fault Conditions)	green – normal red – fault
System/Emergency ROM Flash Recovery with Video	Recovers corrupted system BIOS.
Configuration Record SW	Yes
Over-Temp Warning on Screen (Requires IM Agents)	Yes
OS CD (Restore OS CD)	Restores computer to its original factory shipping image
Restore CD	Restores the computer to its original factory shipping image
Flash ROM	Yes
3.3V Aux Power LED on System PCA	Yes
Dual Function 5V Aux Power LED (ON)/PS_ON LED (OFF) on System PCA	Yes
Clear Password Jumper	Yes
Clear CMOS Button	Yes
CMOS Battery Holder for easy Replacement	Yes
Processor ZIF Socket for easy Upgrade	Yes
DIMM Connectors for easy Upgrade	Yes
NIC LEDs (integrated) (Green & Amber)	Used to determine NIC status
ASF 1.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments
Dual function front power switch	Causes a fail-safe power off when held for 4 seconds

## Technical Specifications

<b>Service and Support</b>	<p>On-site Warranty and Service (Note 1): This three-year, limited warranty and service offering delivers three years of on-site, next business-day (Note 2) service for parts and labor 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.</p> <p><b>NOTE 1:</b> Terms and conditions may vary by country. Certain restrictions and exclusions apply.</p> <p><b>NOTE 2:</b> 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><b>NOTE 3:</b> 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>
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## 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
	SPDIF 6-channel pass-through	Yes
	Audio Jacks	Microphone-In (20-K ohm Input Impedance); rear stereo and front analog microphone ports 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)
	<b>NOTE:</b> *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

<b>Integrated Intel Pro/1000MT Lan-on-Motherboard</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Intel 82540EM Gigabit Controller
	<b>Memory</b>	Integrated 96Kb frame buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI 2.2
	<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>	1.48 watts @ +3.3V AUX supply with 5V tolerance
	<b>Boot ROM support</b>	Yes
	<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, 1000 Mbps
<b>Operating system driver support</b>	Microsoft® Windows® NT® 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4	
<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility	

<b>HP Gigabit by Broadcom (BCM5782) NIC</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Broadcom 5782 PCI LAN Controller
	<b>Memory</b>	Integrated 96Kb frame buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI 2.2
	<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>	1.48 watts @ +3.3V AUX supply with 5V tolerance
	<b>Boot ROM support</b>	Yes
	<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, 1000 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>Dimensions</b>	4.7 x 2.0 x 0.08 in (12 x 5 x 1.9 cm)	
<b>Operating system driver support</b>	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4	
<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility	
<b>Alerting</b>	ASF 1.0	
<b>Kit contents</b>	Broadcom 5782, CD, Broadcom Gigabit Ethernet for HP, drivers, quick install guide, product warranty statement	

### Technical Specifications - Communications

<b>Broadcom BCM5751 NetXtreme Gigabit Ethernet Controller (PCI-E)</b>	<b>Connector</b>	RJ-45	
	<b>Controller</b>	Broadcom 5751 PCI-E 1.0a LAN Controller	
	<b>Memory</b>	Integrated 96Kb frame buffer memory	
	<b>Data rates supported</b>	10/100/1000 Mbps	
	<b>Compliance</b>	IEEE 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	<b>Bus architecture</b>	PCI-E 1.0a	
	<b>Data path width</b>	X1	
	<b>Data path speed</b>	2.5Gbit per sec per direction transfer rate	
	<b>Data transfer mode</b>	Bus-master DMA	
	<b>Hardware certifications</b>	FCC class B, NRTL Mark Canada and United States, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia	
	<b>Power requirement</b>	3.1 watts @ +3.3V AUX supply	
	<b>Boot ROM support</b>	Yes	
	<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, 1000 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>Dimensions</b>	4.4 x 2.2 x 0.08 in (11.2 x 5.5 x .2 cm)	
	<b>Operating system driver support</b>	Microsoft Windows 2000 and XP, Red Hat Linux 7.2, 7.3 and Red Hat Enterprise Linux 3	
<b>Management capabilities</b>	WOL, PXE , Remote cable management		
<b>Alerting</b>	ASF 2.0		
<b>Kit contents</b>	Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI NIC, drivers, quick install guide, product warranty statement		

### Technical Specifications - Communications

<b>Intel Pro 1000 MT Gigabit NIC</b>	<b>Connector</b>	RJ-45	
	<b>Controller</b>	Intel 82540EM Gigabit Controller	
	<b>Memory</b>	Integrated 96Kb frame buffer memory	
	<b>Data rates supported</b>	10/100/1000 Mbps	
	<b>Compliance</b>	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	<b>Bus architecture</b>	PCI 2.2	
	<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>	1.48 watts @ +3.3V AUX supply with 5V tolerance	
	<b>Boot ROM support</b>	Yes	
	<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, 1000 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>Dimensions</b>	6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm)	
	<b>Operating system driver support</b>	Microsoft® Windows® NT® 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4	
<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility		
<b>Kit contents</b>	The Intel Pro 1000 MT NIC, CD containing Intel PROset II NIC drivers, quick install guide, product warranty statement		

## Technical Specifications - Controllers

**LSI Logic LSI20320  
Ultra320 SCSI single  
channel host adapter**

<b>Bus architecture</b>	PCI-X (backward compatible with PCI)
<b>Number of supported devices</b>	Up to 15 SCSI devices
<b>Interface protocol</b>	64 bit, 133MHz PCI-X
<b>Host bus transfer rate</b>	Up to 1MB/s
<b>SCSI data transfer rate</b>	Up to 320MB/s per channel
<b>SCSI Bus</b>	Wide Ultra320, Low Voltage Differential, and Ultra Wide Single-Ended
<b>Internal connector</b>	68-pin HD
<b>External connector</b>	68 pin
<b>Total connectors</b>	2
<b>Plug and Play Support</b>	No
<b>Dimensions (H x L)</b>	6.6 x 2.5 in (16.9 x 6.4 cm)
<b>Approvals</b>	CE, VCCI, Canada, C-Tick, FCC class B, UL 94VO
<b>Operating system support</b>	Microsoft® Windows® XP
<b>Kit contents</b>	Controller card, driver CD, LED cables, user documentation and warranty card.

**Adaptec SCSI RAID 2120S  
Card**

<b>Dimensions (H x D)</b>	2.5 x 6.6 in (6.4 x 16.8 cm) Low profile card
<b>RAID level</b>	0, 1, 10, 5, 50, JBOD
<b>Data Transfer Rate</b>	Up to 320 MB/s
<b>Cache Memory</b>	64 MB (onboard)
<b>Device Support</b>	Up to 15 SCSI devices
<b>Bus Type</b>	64-bit/66 MHz PCI (Also support 32-bit/33 MHz PCI)
<b>Internal Connectors</b>	One 68-pin high-density
<b>External Connectors</b>	One 68-pin VHDCI
<b>System Requirements</b>	Intel PC or equivalent with available PCI slot
<b>Operating Temperature</b>	32° to 131° F (0° to 55° C)
<b>Power Requirements</b>	4 amps @ +5V
<b>Operating System Support</b>	Windows® 2000 Professional, Windows XP Professional
<b>Other</b>	Optimized disk utilization Online RAID Level Migration Online capacity expansion Immediate RAID availability (background initialization) S.M.A.R.T. support
<b>Kit Contents</b>	Controller card, driver CD, LED cables, user documentation and warranty card.

## Technical Specifications - Hard Drives

### 7200 rpm Serial ATA Hard 40GB Drives

<b>Capacity</b>	40020664320 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s	
<b>Buffer</b>	2 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>	18.0 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	78,165,360	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

### 80GB

<b>Capacity</b>	80026361856 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/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>	156,301,488	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

### 160GB

<b>Capacity</b>	160041885696 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/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>	312,581,808	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	



## Technical Specifications - Hard Drives

250GB	<b>Capacity</b>	250059350016 bytes		
	<b>Height</b>	1 in (2.6 cm)		
	<b>Width</b>	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)		
	<b>Interface</b>	Serial ATA		
	<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s		
	<b>Buffer</b>	8 MB		
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.8 ms	
		<b>Average</b>	<9.0 ms	
		<b>Full-Stroke</b>	<u>≤17 ms</u>	
	<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)		

400 GB	<b>Capacity</b>	400,088,457,216 bytes		
	<b>Height</b>	1 in (2.6 cm)		
	<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)		
	<b>Interface</b>	Serial ATA		
	<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s		
	<b>Buffer</b>	8 MB		
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.8 ms	
		<b>Average</b>	<11.0 ms	
		<b>Full-Stroke</b>	<u>≤15 ms</u>	
	<b>Rotational Speed</b>	7,200 rpm		
	<b>Logical Blocks</b>	781,422,768		
	<b>Operating Temperature</b>	41° to 131°F (5° to 55°C)		

10,000 rpm SATA Hard Drives	74GB	<b>Capacity</b>	74,355,769,344 bytes		
		<b>Height</b>	1.0 in (2.54 mm)		
		<b>Width</b>	Media diameter: 3.3 in (84mm) Physical size: 4 in (10.2 cm)		
		<b>Interface</b>	Serial ATA		
		<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s		
		<b>Buffer</b>	8 MB		
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.3 ms	
			<b>Average</b>	4.5 ms	
			<b>Full-Stroke</b>	10.2 ms	
		<b>Rotational Speed</b>	10,000 rpm		
		<b>Logical Blocks</b>	145,226,112		
		<b>Operating Temperature</b>	41° to 140° F (5 to 60° C)		

## Technical Specifications - Hard Drives

**Ultra320 SCSI Hard Drives** (10,000 rpm)

**73GB**

<b>Capacity</b>	73,407,865,856 bytes
<b>Height</b>	1.0 in (2.54 cm)
<b>Width</b>	3.5 in (8.9 cm)
<b>Interface</b>	68 pin LVD SCSI
<b>Synchronous Transfer Rate</b> (Maximum)	320 MB/s
<b>Buffer</b>	8 Mbytes
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 0.3 msec <b>Average</b> <4.5 msec <b>Full-Stroke</b> <11.0 msec
<b>Rotational Speed</b>	10,000 rpm
<b>Logical Blocks</b>	143,374,738
<b>Operating Temperature</b>	40° to 130° F (5° to 55° C)

**300GB**

<b>Capacity</b>	300,000,000,000 bytes
<b>Height</b>	1.0 in (2.54 cm)
<b>Width</b>	3.5 in (8.9 cm)
<b>Interface</b>	68 pin LVD SCSI
<b>Synchronous Transfer Rate</b> (Maximum)	320 MB/s
<b>Buffer</b>	8 Mbytes
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 0.3 msec <b>Average</b> <4.5 msec <b>Full-Stroke</b> <11.0 msec
<b>Rotational Speed</b>	10,000 rpm
<b>Logical Blocks</b>	585,937,500
<b>Operating Temperature</b>	40° to 130° F (5° to 55° C)

## Technical Specifications - Hard Drives

Ultra320 SCSI Hard Drives (15,000 rpm)	36GB	<b>Capacity</b>	36,420,075,520 bytes		
		<b>Height</b>	1.0 in (2.54 cm)		
		<b>Width</b>	3.5 in (8.9 cm)		
		<b>Interface</b>	68 pin LVD SCSI		
		<b>Synchronous Transfer Rate (Maximum)</b>	320 MB/s		
		<b>Buffer</b>	8 Mbytes		
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.3 msec	
			<b>Average</b>	<4.5 msec	
			<b>Full-Stroke</b>	<11.0 msec	
		<b>Rotational Speed</b>	15,000 rpm		
		<b>Logical Blocks</b>	71,132,960		
		<b>Operating Temperature</b>	40° to 130°F (5° to 55°C)		
			73GB	<b>Capacity</b>	73,407,865,856 bytes
<b>Height</b>	1.0 in (2.54 cm)				
<b>Width</b>	3.5 in (8.9 cm)				
<b>Interface</b>	68 pin LVD SCSI				
<b>Synchronous Transfer Rate (Maximum)</b>	320 MB/s				
<b>Buffer</b>	8 Mbytes				
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>			0.3 msec	
	<b>Average</b>			<4.5 msec	
	<b>Full-Stroke</b>			<11.0 msec	
<b>Rotational Speed</b>	15,000 rpm				
<b>Logical Blocks</b>	143,374,738				
<b>Operating Temperature</b>	40° to 130°F (5° to 55° C)				
	146GB			<b>Capacity</b>	146,815,737,856 bytes
		<b>Height</b>	1.0 in (2.5 cm)		
		<b>Width</b>	3.5 in (8.9 cm)		
		<b>Interface</b>	68 pin LVD SCSI		
		<b>Synchronous Transfer Rate (Maximum)</b>	320 MB/s		
		<b>Buffer</b>	8 Mbytes		
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.3 msec	
			<b>Average</b>	<4.5 msec	
			<b>Full-Stroke</b>	<11.0 msec	
		<b>Rotational Speed</b>	15,000 rpm		
		<b>Logical Blocks</b>	143,374,738		
		<b>Operating Temperature</b>	40° to 130°F (5° to 55°C)		

## Technical Specifications - Removable Storage

<b>USB Disk on Key</b>	<b>Dimensions (HxWxD)</b>	0.9 x 0.7 x 3.9 in (2.3 x 1.8 x 9.8 cm)
	<b>Weight</b>	0.05 lb (0.02 kg)
	<b>USB Specification</b>	2.0
	<b>Transfer Rate</b>	Read-1023 KB/Sec; Write-850 KB/Sec
	<b>Storage Media</b>	Solid state flash memory, no moving parts
	<b>Power Supply</b>	USB Bus-powered, no external power required
	<b>Capacity</b>	256 MB

### Technical Specifications - Input/Output Devices

<b>PS/2 OR USB '04 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 $\pm$ 5%
		<b>Power consumption</b>	50-mA maximum (with three LEDs ON)
		<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>Acoustics</b>	43-dBA maximum sound pressure level
	<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, 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>Operating system support</b>	Windows 2000 and Windows XP	
	<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	

### Technical Specifications - Input/Output Devices

USB Modular Keyboard	<b>Physical characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)	
		<b>Dimensions (L x W x H)</b>	18.59 x 6.73 x 0.90 in (472 x 170 x 23 mm) with numeric pad attached	
		<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>Languages</b>	38 available	
	<b>Mechanical</b>	<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>Acoustics</b>	43-dBA maximum sound pressure level	
		<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, 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>	442 in (107 cm) on concrete, 16-drop sequence			
<b>Operating system support</b>	Windows 2000 and Windows XP			
<b>Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, USB-IF			
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS			
<b>Kit contents</b>	Keyboard, numerical keypad, USB cable, I/O Security Software & Documentation CD including Modular Access Keyboard software & installation guide, warranty card, safety and comfort guide			

### Technical Specifications - Input/Output Devices

<b>2-Button Scroll Mouse (PS/2)</b>	<b>Scroll Wheel</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>Mechanical Life</b>	Minimum 200,000 revolutions		
	<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>Mechanical</b>	<b>Resolution</b>	400 ± 20% DPI
			<b>Tracking Speed</b>	10 in/s maximum
			<b>Acceleration</b>	100 in/s
			<b>Switch Actuation</b>	85 g nominal peak force
			<b>Switch Life</b>	1,000,000 operations (using Hasco modified tester)
	<b>Regulatory Approvals</b>	<b>Cable Length</b>	2 m	
		<b>PC98-99</b>	Mechanically compliant	
UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick				

<b>HP Optical Scroll Mouse (USB)</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

<b>HP 3-Button Mouse (PS/2)</b>	<b>Dimensions/Weight</b>	<b>Height</b>	1.42 in (3.6 cm)
		<b>Length</b>	4.17 in (10.7 cm)
		<b>Width</b>	2.87 in (7.4 cm)
		<b>Weight</b>	5.20 oz (150 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>Mechanical</b>	<b>Resolution</b>	400 20% DPI
		<b>Tracking speed</b>	10 in/s Maximum
		<b>Switch life</b>	1,000,000 operations (using Hasco modified tester)
		<b>Switch type</b>	Micro-switches
		<b>Tracking mechanism life</b>	155 miles (250 km) at average speed of 10 in/s
		<b>Cable length</b>	6 ft (1.8 m)
		<b>PC98-99</b>	Mechanically compliant

### Technical Specifications - Input/Output Devices

Spaceball 5000 (USB)	Physical characteristics	<b>Dimensions (H x W x D)</b>	3.0 x 6.0 x 8.4 in (7.6 x 15.2 x 21.3 cm)
		<b>Ball Diameter</b>	2.2 in (5.6 cm)
		<b>Weight</b>	2.1 lb (9.94 kg)
		<b>Features</b>	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw) Certified for leading CAD and DCC applications
	Environmental	<b>Operating temperature</b>	50° to 104° F (10° to 40° C)
		<b>Non-operating temperature</b>	43° to 140° F (6° to 60° C)
		<b>Operating humidity</b>	8% to 80% (non-condensing at ambient)
		<b>Non-operating humidity</b>	5% to 80% (non-condensing at ambient)
	Mechanical	<b>Buttons</b>	12 programmable (unshifted)
		<b>Ball Force Range</b>	0.5 - 8.2N/1.8 - 29.5 oz
		<b>Ball Torque Range</b>	0.085 – 0.33 oz-in. (6.91 Nmm)
		<b>Resolution</b>	10 bits
	Serial Specifications	<b>Connector</b>	USB 1.1 or greater
		<b>Cable Length</b>	12.8 ft. (3.9 m)
		<b>Data Rate</b>	USB model – 16 msec
		<b>Flow Control</b>	Xon/Xoff (on PS/2 model only)
	Software Drivers Available	<b>USB model</b>	Microsoft Windows XP
	System Requirements	<b>Disk Space</b>	10 MB free disk space
	Regulatory Approvals	UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick	
<hr/>			
HP SpaceMouse Plus USB	Physical characteristics	<b>Dimensions (H x W x D)</b>	7.4 x 4.72 x 1.73 in (18.8 x 12.0 x 4.4 cm)
		<b>Cap Diameter</b>	2 x 6.5 x 6.6 mm
		<b>Weight</b>	1.5 lb (0.68 kg)
		<b>Features</b>	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw) Certified for leading CAD and DCC applications
	Environmental	<b>Operating temperature</b>	41° to 140° F (5° to 60° C)
		<b>Non-operating temperature</b>	-13° to 158° F (-25° to 70° C)
		<b>Operating humidity</b>	10 to 98 % RH (non-condensing)
		<b>Non-operating humidity</b>	10 to 98 % RH (non-condensing)
	Mechanical	<b>Buttons</b>	11 programmable (unshifted)
		<b>Cap Force Range</b>	0.2 N – 4.5 N
		<b>Cap Torque Range</b>	4 Nmm to 100 Nmm
		<b>Resolution</b>	8 bit
	USB Specifications	<b>Connector</b>	USB 1.1 or greater
		<b>Cable Length</b>	2 m
		<b>Data Rate</b>	16 msec
	Software Drivers Available	Microsoft Windows XP	
	System Requirements	<b>Disk Space</b>	10 MB free disk space
	Regulatory Approvals	UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick	



### Technical Specifications - Optical Devices

<b>48X CD-ROM Drive</b>	<b>Capacity</b>	700 MB CD disc		
	<b>Dimensions (HxWxD)</b>	1.63 x 5.83 x 7.27 in (4.13 x 14.6 x 18.5 cm)		
	<b>Weight</b>	1.76 lb (0.8 kg)		
	<b>Interface</b>	ATAPI/EIDE		
	<b>Mounting Orientation</b>	Horizontal or vertical		
	<b>Data Transfer Rates - Read</b>	Digital audio extraction (minimum) – 1,200 KB/s (8X) CD read – up to 7,200 KB/s (48X)		
	<b>Media and Formats - Read</b>	<b>Formats:</b> CD-DA, CD-ROM (Mode 1 and 2), CD-XA Ready, Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (FMV), CD Plus, CD-Extra; <b>Media:</b> stamped, CD-R, CD-RW		
	<b>Data Transfer Modes</b>	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 0 (16.7 MB/s); UltraDMA Mode 2 (33.3 MB/s)		
	<b>Access Times (typical)</b>	<b>Random</b>	< 75 ms @ 48x	
		<b>Full-Stroke</b>	< 150 ms	
	<b>Start-up Time (typical)</b>	< 7 s (single session)	< 30 s (multisession)	
	<b>Stop Time (typical)</b>	< 4 s		
	<b>Read Buffer size</b>	128 KB (minimum)		
	<b>Audio Output</b>	<b>Line-Out</b>	0.7 VRMS	
		<b>Signal-to-Noise Ratio</b>	80 dB	
		<b>Channel Separation</b>	65 dB	
	<b>Configuration Jumper Block</b>	Master, slave, and cable select modes		
	<b>Operating Conditions</b>	<b>Temperature</b>	41° to 122° F (5° to 50° C)	
		<b>Humidity</b>	10% to 80%	
	<b>Approvals/ Environmental</b>	UL 1950 (US and Canada), CSA, SEMKO, TUV; CE, FDA, FCC, IC, C-TICK		
<b>Operating Systems Supported</b>	Microsoft Windows 2000 and Microsoft Windows XP			
<b>Supplied Software</b>	None			

### Technical Specifications - Optical Devices

<b>16X/40X DVD-ROM Drive with +R Read Support</b>	<b>Height</b>	5.25-in, half-height, tray load												
	<b>Interface Type</b>	ATAPI/EIDE												
	<b>Dimensions (W x H x D)</b>	5.88 x 1.71 x 7.87 [max] in (149.5 x 43.25 x 200.0 [max] mm) (external, excluding bezel)												
	<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 ; 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>	<table border="0"> <tr> <td><b>DVD-ROM</b></td> <td>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)</td> </tr> <tr> <td><b>CD-ROM</b></td> <td>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)</td> </tr> </table>	<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)	<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)								
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<b>Stop Time</b>	< 4 seconds													
	<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>Maximum Data Transfer Rates</b>	<table border="0"> <tr> <td><b>CD-ROM Read</b></td> <td>6000 KB/s (40X) Max</td> </tr> <tr> <td><b>DVD-ROM Read</b></td> <td>21,600 KB/s (16X) Max</td> </tr> <tr> <td><b>Digital Audio Extraction</b></td> <td>6000 KB/s (40X) Max</td> </tr> </table>	<b>CD-ROM Read</b>	6000 KB/s (40X) Max	<b>DVD-ROM Read</b>	21,600 KB/s (16X) Max	<b>Digital Audio Extraction</b>	6000 KB/s (40X) Max						
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	<b>Power</b>	<table border="0"> <tr> <td><b>Source</b></td> <td>Four-pin, DC power receptacle</td> </tr> <tr> <td><b>DC Power Requirement</b></td> <td>5 VDC <math>\pm</math> 5% – 100 mV ripple p-p 12 VDC <math>\pm</math> 5% – 200 mV ripple p-p</td> </tr> <tr> <td><b>DC Current</b></td> <td>5 VDC – &lt; 800 mA typical, &lt; 1000 mA maximum 12 VDC – &lt; 870 mA typical, &lt; 1800 mA maximum</td> </tr> </table>	<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, < 1800 mA maximum						
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	<b>Audio Output</b>	<table border="0"> <tr> <td><b>Line-Out</b></td> <td>0.7 VRMS</td> </tr> <tr> <td><b>Signal-to-Noise Ratio</b></td> <td>85 dB</td> </tr> <tr> <td><b>Channel Separation</b></td> <td>65 dB</td> </tr> </table>	<b>Line-Out</b>	0.7 VRMS	<b>Signal-to-Noise Ratio</b>	85 dB	<b>Channel Separation</b>	65 dB						
<b>Line-Out</b>	0.7 VRMS													
<b>Signal-to-Noise Ratio</b>	85 dB													
<b>Channel Separation</b>	65 dB													
	<b>Configuration Jumper Block</b>	Master, slave, and cable select modes												
	<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon												
	<b>Operating Environmental</b> (all conditions non-condensing)	<table border="0"> <tr> <td><b>Temperature (operating)</b></td> <td>41° to 122° F (5° to 50° C)</td> </tr> <tr> <td><b>Relative Humidity (operating)</b></td> <td>10% to 85%</td> </tr> <tr> <td><b>Maximum Wet Bulb Temperature (operating)</b></td> <td>86° F (30° C)</td> </tr> </table>	<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)						
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<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, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992												
	<b>Operating Systems Supported</b>	Microsoft Windows 2000, Windows XP Professional												
	<b>Kit Contents</b>	16X/40X DVD-ROM Drive, InterVideo WinDVD MPEG Movie Playback software, audio cable, and installation guide.												

### Technical Specifications - Optical Devices

#### HP 48X CD-RW

<b>Height</b>	5.25-inch, half-height, tray-load
<b>Mounting Orientation</b>	Horizontal or vertical
<b>Interface</b>	ATAPI/EIDE
<b>Dimensions (HxWxD)</b>	1.63 x 5.75 x 7.27 [max] in (4.13 x 14.6 x 18.5 [max] cm) (external, excluding bezel)
<b>Weight (max)</b>	2.0 lb (0.9 kg)
<b>Read Only Disc Parameters</b>	<p><b>Data Transfer Rates – Read</b> Digital audio extraction (minimum) – 1,800 KB/s (12X) CD read – up to 7,200 KB/s (48X)</p> <p><b>Media and Formats – Read</b> <b>Formats:</b> CD-DA, CD-ROM (Mode 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed Mode, CD-Plus, CD-Extra, CD-I FMV, Video CD, CD-Text, Photo CD (single and multisession) <b>Media:</b> stamped, CD-R, CD-RW</p>
<b>Writeable Disc Parameters</b>	<p><b>Data Transfer Rates – Write</b> CD-R write – 2100 KB/s (14X) to 7200 KB/s (40X) CD-RW write – 600 KB/s (4X) CD-RW write (high speed) – 1500 KB/s (10X) to 1800 KB/s (12X) CD-RW write (ultra high speed) – 2400 KB/s (16X) to 4800 KB/s (32X)</p> <p><b>Media and Formats – Write</b> <b>Formats:</b> CD-DA, CD-ROM (Mode 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed Mode, CD-Plus, CD-Extra, CD-I FMV, Video CD, CD-Text <b>Media:</b> CD-R, CD-RW (including ultra-speed)</p> <p><b>Write Methods</b> Disc-at-once, session-at-once,, track-at-once, incremental fixed and variable packet, multisession</p>
<b>Access Times</b> (typical reads, including settling)	<p><b>CD-ROM Mode 1</b> 125 ms</p> <p><b>Full Stroke CD</b> 210 ms (seek)</p> <p><b>Start-up Time</b> (typical) &lt;7 s (single session), &lt;30 s (multisession)</p> <p><b>Stop Time</b> (typical) &lt;4 s</p> <p><b>Write Buffer Size</b> 2 MB</p> <p><b>Data Transfer Modes</b> PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 2 (33.3 MB/s)</p>
<b>Power</b>	<p><b>Source</b> Four-pin, DC power receptacle</p> <p><b>DC Power Requirement</b> 5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p</p> <p><b>DC Current</b> 5 VDC (&lt; 1000 mA typical, &lt; 1600 mA maximum) 12 VDC (&lt; 600 mA typical, &lt; 1400 mA maximum)</p> <p><b>Total Drive Power</b> (standby mode) &lt; 2.5 Watt</p>
<b>Audio Output</b>	<p><b>Line-Out</b> 0.7 VRMS</p> <p><b>Signal-to-Noise Ratio</b> 74 dB</p> <p><b>Channel Separation</b> 65 dB</p>
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes
<b>Operating Conditions</b>	<p><b>Temperature</b> 41° to 122° F (5° to 50° C)</p> <p><b>Humidity</b> 10% to 90%10% to 90%</p>

### Technical Specifications - Optical Devices

<b>Approvals/ Environmental</b>	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec SFF-8020, 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>Operating Systems Supported</b>	Microsoft Windows 2000, Windows XP Professional
<b>Supplied software</b>	Roxio Easy CD & DVD Creator: Create or copy CDs and DVDs, including music and data CDs, and data DVDs Dantz Retrospect Express: Back up systems to CD, DVD, or tape media.

<b>48X Combo CD-RW/DVD-ROM</b>	<b>Height</b>	5.25-inch, half-height, tray-load
	<b>Mounting Orientation</b>	Either horizontal or vertical
	<b>Interface Type</b>	ATAPI/EIDE
	<b>Dimensions (W x H x D)</b>	5.77 x 1.71 x 7.87 [max] in (14.66 x 4.34 x 20.0 [max] cm) (external, excluding bezel)
	<b>Weight (max)</b>	2.6 lb (1.2 kg)
	<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-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 Multisession , and DVD+RW
		<b>Capacity</b> 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)
		<b>CD-ROM, CD-R, CD-RW read</b> 7200 KB/s (48X) Max
		<b>DVD ROM read</b> 21,632 KB/s (16X) Max
	<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 (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	
	<b>Capacity</b> 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (mode 2, 12 cm)	
	<b>CD-R write</b> 7200 KB/s (48X) Max	
	<b>CD-RW write</b> 4800 KB/s (32X) Max	
<b>Access Times</b> (typical reads, including settling)	<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 (seek)	
	<b>Startup Time (single)</b> < 7 seconds (typical)	
	<b>Startup Time (multi-session)</b> < 30 seconds (typical)	
	<b>Stop Time</b> < 4 seconds	
	<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 Mbytes/s (default)	

### Technical Specifications - Optical Devices

<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 (< 1000 mA typical, < 1600 mA maximum) 12 VDC (< 600 mA typical, < 1400 mA maximum)
	<b>Total Drive Power</b> (standby mode)	< 2.5 Watt
<b>Audio Output</b>	<b>Line-Out</b>	0.7 VRMS
	<b>Signal-to-Noise Ratio</b>	74 dB
	<b>Channel Separation</b>	65 dB
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes	
<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon	
<b>Operating Environmental</b> (all conditions 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>Certifications, Requirements</b>	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec SFF-8020, 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>Operating Systems Supported</b>	Microsoft Windows 2000, Windows XP Professional	
<b>Option Kit Contents</b>	48X Combo CD-RW/DVD-ROM Drive, Roxio Easy CD & DVD Creator, InterVideo WinDVD MPEG Movie Playback software, Dantz Retrospect Express Backup software, audio cable, and installation guide.	

## Technical Specifications - Optical Devices

### 16X DVD+/-RW

<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>	4.7 GB (single-layer), 8.5 GB (double-layer)	
<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 7.9 in (15.0 x 4.4 x 20.0 cm)	
<b>Weight (maximum)</b>	2.6 lb (1.2 kg)	
<b>Recording Method</b>	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet	
<b>Write Support</b>	DVD+R (1.3), DVD+R DL (1.0), DVD+RW (1.2), DVD-R (2.0), DVD-RW (1.1), CD-R (OBII Vol2.0 Rev 1.2), CD-RW (LS, HS, US)	
<b>Read Support</b>	DVD-ROM (single- and dual-layer), DVD-Video, DVD+R (include multisession), DVD+RW, DVD-R (incl. multiborder), DVD-RW, DVD-MRW; CD-ROM Mode 1, CD-ROM XA (Mode 2, forms 1 and 2), CD-TEXT, Photo CD single- and multi-session), CD-DA (Audio CD), CD-Extra, CD-R, CD-RW (supports AM2), VCD, CD-I, UDF (1.02 and 1.50), CD-MRW	
<b>Write Speed (maximum)</b>	<b>DVD+R</b>	16X CAV (21,600 KB/s), 8x ZCLV (10,800 KB/s), 2.4-8x CLV (3250-10,800 KB/s)
	<b>DVD+RW</b>	2.4-4X CLV (3250-5400 KB/s)
	<b>DVD-R</b>	2-4X CLV (2700-5400 KB/s), 8X ZCLV (10,800 KB/s)
	<b>DVD-RW</b>	2-4X CLV (2700-5400 KB/s)
	<b>CD-R</b>	16-40X CAV (2400-6000 KB/s)
	<b>CD-RW (US)</b>	4-24X CLV (600-3600 KB/s)
<b>Read Speed (maximum)</b>	<b>DVD-ROM</b>	5-16X CAV (6750 - 21,600 KB/s)
	<b>DVD+R, DVD+RW, DVD-R, DVD-RW</b>	4-8X CAV (5400 - 10,800 KB/s)
	<b>CD-ROM, CD-R, CD-RW, CD-Audio</b>	16-40X CAV (2400 to 6000 KB/s)

### Technical Specifications - Optical Devices

<b>Access Time</b> (typical reads, including settling)	<b>Random DVD</b>	< 130 ms (typical)
	<b>Random CD</b>	< 120 ms, (typical)
	<b>Full Stroke DVD</b>	< 240 ms (seek)
	<b>Full Stroke CD</b>	< 200 ms (seek)
	<b>Startup Time</b> (single)	< 7 seconds (typical)
	<b>Startup Time</b> (multi-session)	< 30 seconds (typical)
	<b>Stop Timex</b>	< 4 seconds
	<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 on most HP xw workstations)
	<b>Power</b>	<b>Source</b>
<b>DC Power Requirement</b>		5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 10%-200 mV ripple p-p
<b>DC Current</b>		5 VDC (< 2000 mA typical, < 2500 mA maximum) 12 VDC (< 700 mA typical, < 2000 mA maximum)
<b>Total Drive Power</b> (standby mode)		< 2.5 Watt
<b>Audio Output</b>	<b>Line-Out</b>	0.7 VRMS
	<b>Signal-to-Noise Ratio</b>	74 dB
	<b>Channel Separation</b>	65 dB
<b>Operating Environmental</b> (all conditions 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 IV 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>Operating Systems Support</b>	Windows XP Professional and Linux. (Red Hat Linux 7.2, 7.3, 8, 9.0 may require additional third party software to make full use of this device)	
<b>Regulatory Approvals</b>	MPC-3 and MMC-4 compliant, multi-read certified, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 60950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 60950, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC Class B, BSMI-CNS 13438, CE EN60950, EN55022:1998 and EN55024, Microsoft Logo for Windows XP, relevant parts of IEC 61000-4.	
<b>Option Kit contents</b>	16X DVD $\pm$ R/ $\pm$ RW Drive, InterVideo WinDVD, InterVideo WinDVD Creator, Roxio Easy Media Creator, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media. <b>NOTE:</b> This DVD writer kit does not include any software for burning DVDs on Linux. DVD burning is supported with the 'growisofs' command. CD burning is supported with the 'cdrecord' command. Red Hat Enterprise Linux WS 3 distribution includes both 'cdrecord' and 'growisofs'. Red Hat Linux 7.2, 7.3, 8, 9.0 distributions only include 'cdrecord'. Therefore DVD burning is only supported on WS 3.	

### Technical Specifications - Graphics

<b>NVIDIA Quadro 280 NVS (PCI)</b>	<b>Form Factor</b>	ATX
	<b>Graphic Controller</b>	Integrated Quadro 280 2-D graphics processor unit (GPU)
	<b>VGA controller</b>	Integrated into the Quadro GPU
	<b>Bus type</b>	PCI
	<b>RAMDAC</b>	Dual 350 MHz
	<b>Memory</b>	64 MB DDR with frame buffer and Texture storage
	<b>Connector</b>	Single High-density Flex Connector
	<b>Dimensions</b>	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	<b>Controller clock speed</b>	275 MHz
	<b>Color planes</b>	32-bit color buffer
	<b>Overlay planes</b>	1 16-bit Video overlay plane
	<b>Maximum vertical refresh rate</b>	120 Hz
	<b>Maximum pixel clock</b>	350 MHz
	<b>Multi-monitor support</b>	Dual analog or digital monitors
	<b>Single DVI Support</b>	Yes
	<b>Dual DVI Support</b>	Yes
	<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) Red Hat Linux HP qualified drivers may be preloaded or available from the HP support web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum resolution</b>	2048 x 1536 Analog 1600 x 1200 Digital



### Technical Specifications - Graphics

<b>NVIDIA Quadro NVS 280 Graphics Card (PCI-Express)</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	Integrated Quadro 280 2-D graphics processor unit (GPU)
	<b>VGA controller</b>	Integrated into the Quadro GPU
	<b>Bus Type</b>	PCI-Express x16 or PCI
	<b>RAMDAC</b>	Dual 350 MHz integrated
	<b>Memory</b>	64 MB 000 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage
	<b>Connectors</b>	Single High-density Flex Connector
	<b>Multi-monitor support</b>	Dual integrated analog display controllers supporting up to two analog displays at 1920 x1200 @ 85Hz or two digital displays at 1600x1200 @ 60Hz
	<b>Additional product features</b>	<b>Controller clock speed</b> 250 MHz <b>Color planes</b> 32-bit color buffer <b>Overlay planes</b> 1 16-bit Video overlay plane <b>Maximum vertical refresh rate</b> 120 Hz <b>Maximum pixel clock</b> 350 MHz <b>Single DVI Support</b> Yes <b>Dual DVI Support</b> Yes <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>PCI-Express</b>	Supports X16 PCI-E
	<b>Available graphics drivers</b>	Microsoft Windows® XP or Windows 2000 (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: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum resolution</b>	2048 x 1536 Analog 1600 x 1200 Digital

### Technical Specifications - Graphics

<b>NVIDIA Quadro FX 330 Graphics Card</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	NVIDIA Nv37GL
	<b>Bus Type</b>	PCI-Express x16
	<b>Memory</b>	64 MB 000 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage
	<b>Connectors</b>	DMS-59 output supporting up to two analog or digital (with optional cable) displays
	<b>Multi-monitor support</b>	Dual integrated analog display controllers supporting up to two analog displays at 2048 x1536 @ 60Hz or two digital displays at 1600x1200 @ 60Hz
	<b>RAMDAC</b>	Dual 350 MHz integrated
	<b>Architecture features</b>	64-bit memory interface
		128-bit IEEE floating-point precision graphics pipeline
		128-bit color precision
		12-bit sub-pixel precision
		4x FSAA at 1024x768
		Hardware accelerated antialiased points and lines
		Hardware OpenGL overlay planes
		Hardware accelerated two-sided lighting
		Hardware accelerated clipping planes
		Hardware accelerated occlusion culling
3D volumetric texture support		
<b>Shading architecture</b>	Fully programmable GPU Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL	
<b>Supported graphics APIs</b>	OpenGL 1.5 DirectX 9.0	
<b>Available graphics drivers</b>	HP-tested: Microsoft Windows® XP, Windows 2000, and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .	
<b>Maximum Resolution</b>	Dual DVI-I output with optional cable – drives dual digital displays at resolutions up to 1600x1200 @ 60Hz	
	Internal 350MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 60Hz each	

## Technical Specifications - Graphics

<b>ATI FireGL V3100 Graphics Card</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	RV370
	<b>Bus Type</b>	PCI-Express x16
	<b>Memory</b>	128MB 200MHz DDR unified frame buffer, Z-buffer and Texture storage
	<b>Connectors</b>	1 DVI-I analog/digital and 1 VGA analog monitor output
	<b>Multi-monitor support</b>	Dual integrated display controllers supporting up to 2048x1536 @ 85Hz on both displays
	<b>RAMDAC</b>	Dual 400 MHz integrated
	<b>Architecture features</b>	128-bit memory interface 128-bit IEEE floating-point precision 24-bits per RGBA color precision 4-bit sub-pixel precision 2 parallel geometry engines 4 parallel pixel pipelines 2x/4x/6x FSAA Hardware accelerated antialiased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes Hardware accelerated occlusion culling Hardware accelerated clip planes
	<b>Shading architecture</b>	Smartshader™ technology Programmable pixel and vertex shaders 16 textures per pass Pixel shaders up to 160 instructions with 32-bit floating point precision for each RGBA component Multiple render target support Shadow volume rendering acceleration High precision 10-bit per channel frame buffer support
	<b>Supported graphics APIs</b>	OpenGL 1.5 DirectX 9.0
	<b>Available graphics drivers</b>	HP-tested: Microsoft Windows XP, Windows 2000, and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum Resolution</b>	DVI-I output – drives digital display at resolutions up to 1600x1200 Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 85Hz each

### Technical Specifications - Graphics

<b>NVIDIA Quadro FX 540 PCI-Express Graphics Card</b>	<b>Form Factor</b>	ATX, 4.376" x 7.0" Single slot
	<b>Graphics Controller</b>	NVIDIA NV43GL
	<b>Bus Type</b>	PCI-Express x16, <75W power consumption
	<b>RAMDAC</b>	Dual 400 MHz integrated
	<b>Memory</b>	128 MB 275 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage 8.8 GB/sec graphics memory bandwidth
	<b>Connectors</b>	DVI-I + VGA + 10-pin HDTV Out (HD cable purchased separately)
	<b>Multi-monitor support</b>	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 75Hz, one digital display at 1600x1200 @ 60Hz.
	<b>Additional product features</b>	128 KB BIOS 3.3V Flash ROM reprogrammable by SW Hardware accelerated Overlay Planes Hardware accelerated two-sided lighting Hardware accelerated antialiased points and lines 3D Volumetric Texture support Hardware accelerated Occlusion Culling Compliant with Microsoft/Intel PC2001 Workstation requirements Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications DDC2B+ Monitor support on all OS platforms ACPI Version 1.0b Power Management support (all modes)
	<b>Shading architecture</b>	Fully programmable GPU (OpenGL 1.5/DirectX 9.0c class) Long fragment programs (up to 65,536 instructions) Long vertex programs (up to 65,536 instructions) Looping and subroutines (up to 256 loops per vertex program) Dynamic flow control Conditional execution Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL
	<b>Supported graphics APIs</b>	OpenGL 1.5 ICD with immediate mode support for all OGL primitive types DirectX 9.0c
	<b>Available graphics drivers</b>	HP-tested: Microsoft Windows XP, Windows 2000, and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum Resolution</b>	DVI-I output - drives digital display at resolutions up to 1600x1200 @ 60Hz Internal 400MHz RAMDACs - drives dual analog displays up to 2048x1536 @ 75Hz each

### Technical Specifications - Graphics

<b>NVIDIA Quadro FX 1300 Graphics Card</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	NVIDIA NV38GL
	<b>Bus Type</b>	PCI-Express x16
	<b>Memory</b>	128 MB 275 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage
	<b>Connectors</b>	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	<b>Multi-monitor support</b>	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 60Hz on both displays or dual digital displays at 1600x1200 @ 60Hz NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows
	<b>RAMDAC</b>	Dual 400 MHz integrated
	<b>Architecture features</b>	256-bit memory interface 128-bit IEEE floating-point precision graphics pipeline 128-bit color precision 12-bit sub-pixel precision 4x FSAA at 1280x1024 Hardware accelerated antialiased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes Hardware accelerated occlusion culling 3D volumetric texture support Quad-buffered stereo
	<b>Shading architecture</b>	Fully programmable GPU Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL
	<b>Supported graphics APIs</b>	OpenGL 1.5 DirectX 9.0
	<b>Available graphics drivers</b>	HP-tested: Microsoft Windows® XP, Windows 2000, and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum Resolution</b>	Dual DVI-I output – drives dual digital displays at resolutions up to 1600x1200 @ 60Hz Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 75Hz each

### Technical Specifications - Graphics

<b>NVIDIA Quadro FX 1400 PCI-Express Graphics Controller</b>	<b>Form Factor</b>	ATX, 4.376" x 8.5" Single slot
	<b>Graphics Controller</b>	NVIDIA NV41GL
	<b>Bus Type</b>	PCI-Express x16, <75W power consumption
	<b>RAMDAC</b>	Dual 400 MHz integrated
	<b>Memory</b>	128 MB 300 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage 19.2 GB/s graphics memory bandwidth
	<b>Connectors</b>	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	<b>Multi-monitor support</b>	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays.
	<b>Additional product features</b>	128 KB BIOS 3.3V Flash ROM reprogrammable by SW Hardware accelerated Overlay Planes Hardware accelerated two-sided lighting Hardware accelerated antialiased points and lines Quad-buffered Stereo 3D Volumetric Texture support Hardware accelerated Occlusion Culling Scalable Link Interface (SLI) technology Compliant with Microsoft/Intel PC2001 Workstation requirements Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications DDC2B+ Monitor support on all OS platforms ACPI Version 1.0b Power Management support (all modes)
	<b>Shading architecture</b>	Fully programmable GPU (OpenGL 1.5/DirectX 9.0c class) Long fragment programs (up to 65,536 instructions) Long vertex programs (up to 65,536 instructions) Looping and subroutines (up to 256 loops per vertex program) Dynamic flow control Conditional execution Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL
	<b>Supported graphics APIs</b>	OpenGL 1.5 ICD with immediate mode support for all OGL primitive types DirectX 9.0c
	<b>Available graphics drivers</b>	HP-tested: Microsoft Windows XP, Windows 2000 and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum Resolution</b>	Dual DVI-I output – drives dual digital displays at resolutions up to 1900x1200 @ 60Hz Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 85Hz each

### Technical Specifications - Graphics

<b>ATI FireGL V5100 PCI-Express Graphics Controller</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	RV423
	<b>Bus Type</b>	PCI-Express x16
	<b>Memory</b>	128 MB 350MHz DDR unified frame buffer, Z-buffer and Texture storage
	<b>Connectors</b>	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	<b>Multi-monitor support</b>	Dual integrated display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays.
	<b>RAMDAC</b>	Dual 400 MHz integrated
	<b>Architecture features</b>	256-bit memory interface 128-bit IEEE floating-point precision 24-bits per RGBA color precision 8-bit sub-pixel precision 6 parallel geometry engines 12 parallel pixel pipelines 2x/4x/6x FSAA Hardware accelerated antialiased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes Hardware accelerated occlusion culling Hardware accelerated clip planes Quad-buffered stereo
	<b>Shading architecture</b>	Smartshader™ technology Programmable pixel and vertex shaders 16 textures per pass Pixel shaders up to 160 instructions with 32-bit floating point precision for each RGBA component Multiple render target support Shadow volume rendering acceleration High precision 10-bit per channel frame buffer support
	<b>Supported graphics APIs</b>	OpenGL 1.5 DirectX 9.0
	<b>Available graphics drivers</b>	HP-tested: Microsoft Windows XP, Windows 2000, and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum Resolution</b>	DVI-I output – drives digital displays at resolutions up to 1600x1200 Internal 400MHz RAMDAC – drives dual analog displays up to 2048x1536 @ 85Hz each

### Technical Specifications - Graphics

<b>NVIDIA Quadro FX 3400 Graphics Card</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	NVIDIA NV45GL
	<b>Bus Type</b>	PCI-Express x16
	<b>Memory</b>	256 MB 450 MHz GDDR3 SDRAM unified frame buffer, Z-buffer and Texture storage
	<b>Connectors</b>	2 DVI-I (one dual-link/one single-link) analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	<b>Multi-monitor support</b>	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1600x1200 (single-link) and 3840x2400 (dual-link).  NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows
	<b>RAMDAC</b>	Dual 400 MHz integrated
	<b>Architecture features</b>	256-bit memory interface 128-bit IEEE floating-point precision graphics pipeline 128-bit color precision 12-bit sub-pixel precision 8x FSAA at 1920x1200, 4x at 2048x1536, rotated grid FSAA sampling algorithm Hardware accelerated antialiased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes 3rd generation occlusion culling 3D volumetric texture support Quad-buffered stereo Dual Link DVI enabling driving digital displays up to 3840x2400 (24Hz)
	<b>Shading architecture</b>	Fully programmable GPU Long fragment programs (up to 65,536 instructions) Long vertex programs (up to 65,536 instructions) Looping and subroutines (up to 256 loops per vertex program) Dynamic flow control Conditional execution
	<b>Supported graphics APIs</b>	OpenGL 1.5 DirectX 9.0
	<b>Available graphics drivers</b>	HP-tested: Microsoft Windows XP, Windows 2000, and Linux HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a> .
	<b>Maximum Resolution</b>	Dual DVI-I output – drives dual digital displays at resolutions up to 1600x1200 @ 60Hz (single-link) and 3840x2400 @ 24Hz (dual-link).  Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 75Hz each



### Technical Specifications - Monitors

HP CRT Monitor p1230	Tube	<b>Type</b>	Diamondtron NF Aperture Grille CRT	
		<b>Tube Size</b> (diagonal)	22 in (55 cm)	
		<b>Viewable Image Area</b> (diagonal)	20 in (51 cm)	
		<b>Aperture Grille Pitch</b>	0.24 mm	
		<b>Screen Curvature</b>	Flat	
<b>Signal Interface/ Performance</b>		<b>Horizontal Frequency</b>	30 to 140 kHz	
		<b>Vertical Frequency</b>	50 to 160 Hz	
		<b>Maximum Resolution</b>	2048 x 1536 @ 85 Hz (GTF)	
		<b>Recommended Resolution</b>	1600 x 1200 @ 85 Hz or 1280 x 1024 @ 85 Hz	
		<b>Preset VESA Graphic Modes</b> (non-interlaced)	1920 x 1440 @ 60 Hz, 75 Hz	
			1792 x 1344 @ 60 Hz, 75 Hz	
			1600 x 1200 @ 75 Hz, 85 Hz	
			1280 x 1024 @ 60 Hz, 75 Hz, 85	
			1024 x 768 @ 75 Hz, 85 Hz	
			800 x 600 @ 75 Hz, 85 Hz	
			640 x 480 @ 60 Hz, 85 Hz	
			<b>Preset MAC Mode</b>	1152 x 870 @ 75 Hz
			<b>Preset VGA Mode</b>	640 x 480 @ 60 Hz and 720 x 400 @ 70 Hz
			<b>Maximum Pixel Clock Speed</b>	420 MHz
			<b>User Programmable Modes</b>	15 (10 preset modes and 5 additional modes)
		<b>Anti-Glare</b>	Yes	
		<b>Anti-Static</b>	Yes	
		<b>AssetControl</b>	Yes	
		<b>Default Color Temperature</b>	9300 K	
<b>On Screen Display (OSD) Controls</b>		<b>Buttons or Switches</b>	OSD menu, brightness, contrast, Super Bright, dual input, power on/off	
		<b>Languages</b>	English, Spanish, French, German, Italian, Japanese	
		<b>User Controls</b>	Brightness, contrast, pincushion, pincushion balance, trapezoid, tilt (rotation), color temperature, degauss, parallelogram, individual color control, zoom, moiré cancellation, convergence, corner purity, image control, language, OSD control, factory reset	
<b>Video Input</b>		<b>Plug and Play</b>	Yes, DDC/CI compatible	
		<b>Input Signal</b>	Two 15-pin D-sub connections	
		<b>Input Impedance</b>	75 ohms	
		<b>Sync Input</b>	Separate sync (HSYNC/VSYNC)	
		<b>Video Cable</b>	Detachable 15-pin D-sub mini connector (included)	
<b>Power</b>		<b>Video Cable Length</b>	70 in (1.8 m); non-captive	
		<b>Power Supply</b>	Universal 100-120/220-240 VAC	
		<b>Frequency</b>	50/60 Hz	
		<b>Maximum</b>	135 watts	
		<b>Power Saving</b>	2 watts maximum	
		<b>Off Mode</b>	0 watts	
		<b>Power Cable Length</b>	70 in (1.8 m); non-captive	

### Technical Specifications - Monitors

<b>Mechanical</b>	<b>Dimensions (H x W x D)</b>	Unpacked (including pedestal)	19.1 x 19.5 x 18.8 in (48.6 x 49.5 x 47.7 cm)
		Packaged	25.6 x 25.0 x 25.4 in (65.1 x 63.6 x 64.6 cm)
<b>Environmental</b>	<b>Tilt Range</b>	Unpacked	66.1 lb (30 kg)
		Packaged	77.1 lb (35 kg)
	<b>Swivel Range</b>	10° upward and 5° downward	
	<b>Temperature - Operating</b>	90° either side of center	
	<b>Temperature - Non-operating</b>	41° to 90° F (5° to 35° C) non-condensing	
	<b>Humidity - Operating</b>	-4° to 140° F (-20 to 60° C)	
	<b>Humidity - Non-operating</b>	10% to 90% non-condensing	
	<b>Altitude - Operating</b>	10% to 90%	
	<b>Altitude - Non-operating</b>	0 to 7,200 ft (0 to 2,195 m)	
	<b>Altitude - Non-operating</b>	0 to 30,000 ft (0 to 9,144 m)	
<b>Other</b>	<b>Accessories Included</b>	Power cable, video cable (D-sub to D-sub), documentation kit	
	<b>User Guide Languages</b>	English, French, German, Spanish, Italian, Dutch, Brazilian Portuguese, Danish, Finnish, Greek, Japanese, Korean, Latin American Spanish, Norwegian, Polish, Russian, Slovenian, Turkish, Swedish, Traditional Chinese, Simplified Chinese	
	<b>Warranty Languages</b>	English, French, Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Japanese, Korean, T. Chinese, S. Chinese	
<b>Certification and Compliance</b>	<b>Color</b>	Carbon and silver	
<b>Service and Warranty</b>	MPR-II (Low Emissions), TCO '03, *Energy Star Compliant, UL Listing, ISO9241-3 VOT Guidelines Approval, FCC Approval, CE Mark (including PFC), GS Mark * <a href="#">Energy Star Compliant available summer of 2004.</a>		
	Limited three-year parts and repair labor, service provider labor, and on-site service. Next business day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply.		

### Technical Specifications - Monitors

HP L1755 Flat Panel Monitor	Panel	<b>Type</b>	Active matrix, thin film transistor (TFT)
		<b>Viewable Image Area</b> (diagonal)	17 in (43.2 cm) maximum viewable
		<b>Screen Opening</b> (WxH)	13.4 x 10.7 in (33.9 x 27.2 cm)
		<b>Viewing Angle</b> (typical)	176 degrees horizontal/176 degrees vertical (10:1 minimum contrast ratio)
		<b>Brightness</b> (typical)	Up to 250 nits (cd/m <sup>2</sup> )
		<b>Contrast Ratio</b> (typical)	Up to 1000:1 (typical)
		<b>Response Rate</b> (typical)	25 ms (typical rise + fall)
		<b>Pixel Pitch</b>	0.264 mm
		<b>Color Depth Support</b>	16.7 million colors
	Video/Other Inputs	<b>Plug and Play</b>	Yes (supports VESA DDC2B; PC2001 compliant)
		<b>Self Powered USB 2.0 Hub</b>	One upstream, four downstream ports (cable included)
		<b>Input Signal</b>	Two connectors: one 15-pin mini D-sub analog VGA; and one DVI-I (VGA analog or digital)
		<b>Input Impedance</b>	75 ohms ± 2%
		<b>Sync Input</b>	Separate sync (HSYNC/VSING); composite sync, Sync on Green (activated through on-screen display)
		<b>Video Cable</b>	VGA to VGA, DVI-D to DVI-D, and DVI-I to VGA
		<b>Video Cable Length</b>	78 in (2.0 m)
	Signal Interface/ Performance	<b>Horizontal Frequency</b>	30 to 82 kHz
		<b>Vertical Frequency</b>	56 to 75 Hz
		<b>Native Resolution</b>	1280 x 1024 @ 60 Hz analog
			1280 x 1024 @ 60 Hz digital
		<b>Maximum Resolution</b> (Analog)	1280 x 1024 @ 75 Hz analog
		<b>Maximum Resolution</b> (Digital)	1280 x 1024 @ 75 Hz digital
		<b>Preset VESA Graphic Modes</b> (non-interlaced)	640 x 480 @ 60 Hz, 72 Hz, 75 Hz
			720 x 400 @ 70 Hz
			800 x 600 @ 60 Hz, 72 Hz, 75 Hz
			1024 x 768 @ 60 Hz, 70 Hz, 75 Hz
			1280 x 1024 @ 60 Hz, 75 Hz
		<b>Preset MAC Mode</b>	832 x 624 @ 75 Hz
			1152 x 870 @ 75 Hz
		<b>Preset VGA Mode</b>	640 x 480 @ 60 Hz, 72 Hz
		<b>Preset SUN Mode</b>	1152 x 900 @ 76 Hz
		<b>Fail Safe Mode</b>	Yes (limits out of range signal messages)
		<b>Maximum Pixel Clock Speed</b>	140 MHz
		<b>User Programmable Modes</b>	Yes, 15
		<b>Anti-Glare</b>	Yes
		<b>Anti-Static</b>	Yes
		<b>AssetControl</b>	Yes (accessible on HP Compaq Business Desktops featuring Intelligent Manageability)
		<b>Default Color Temperature</b>	Yes (6500k, 9300k, sRGB, Custom User)
	On Screen Display (OSD) Controls	<b>Buttons or Switches</b>	Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch

### Technical Specifications - Monitors

	<b>Languages</b>	English, Spanish, French, German, Italian, Japanese, Simplified Chinese
	<b>User Controls</b>	Size and positioning, contrast, brightness, clock, clock phase, selectable color temperature, serial number, mode displayed, sleep timer, input selection, factory reset, individual color contrast, full-screen resolution
<b>Power</b>	<b>Power Supply</b>	Auto-ranging, 90 to 265 VAC; internal power supply
	<b>Input Power</b>	100 ~ 240 VAC
	<b>Nominal Current</b>	1.5 A maximum
	<b>Frequency</b>	50 ~ 60 Hz
	<b>Average</b>	33 watts when displaying standard office software
	<b>Typical Power Consumption</b>	< 40 watts
	<b>Maximum</b>	< 60 watts
	<b>Power Saving</b>	< 2 W
	<b>Off Mode</b>	0 watts (when master power switch is in the off position)
	<b>Power Cable Length</b>	70 in (1.8 m); non-captive
	<b>Mechanical</b>	<b>Dimensions</b> (H x W x D)
		<b>Base Area</b> 8.3 x 12.2 in (Footprint D x W) (21.1 x 30.9 cm)
		<b>Panel only</b> (without stand) 11.8 x 14.4 x 2.9 in (H x W x D) (30.1 x 40.9 x 7.3 cm)
		<b>Unpacked with stand</b> 14.7 lb (6.7 kg)
		<b>Unpacked without stand</b> 8.1 lb (3.7 kg)
		<b>Packaged</b> 20.2 lb (9.2 kg)
		<b>Weight</b>
		<b>Bezel Width</b> 13 mm left and right, 14 mm top, and 15 mm bottom
		<b>Tilt Range</b> -5° to +35°
		<b>Swivel Range</b> ± 50° horizontal swivel
		<b>Height Adjustable</b> Yes (5.1 in/13 cm adjustment range)
	<b>Pivot Rotation</b> Yes, 90 °	
<b>Environmental</b>	<b>Base</b>	Ships detached and is removable after installation
	<b>Temperature – Operating</b>	41° to 95° F (5° to 35° C)
	<b>Temperature – Non-operating</b>	-4° to 140° F (-20° to 60° C)
	<b>Humidity – Operating</b>	20% to 80%
	<b>Humidity – Non-operating</b>	5% to 95%
	<b>Altitude – Operating</b>	0 to 13,000 ft (0 to 4,000 m)
	<b>Altitude – Non-operating</b>	0 to 40,000 ft (0 to 12,192 m)
<b>Options</b>	<b>HP Desktop Access Center – Part number: DK985A</b>	Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions. Sold separately. For more information, refer to the HP Desktop Access Center QuickSpec document.
	<b>HP Flat Panel Speaker Bar – Part number: PF804AA</b>	Powered directly by the monitor, seamlessly attaches to the monitor's bezel to bring full multimedia support to select HP flat panel monitors. Features dual speakers with full sound range and external jack for headphones. Sold

	<p>separately. For more information, refer to the HP Flat Panel Speaker Bar QuickSpec document.</p> <p><b>HP Compaq 7000 Series Ultra-slim Desktop Integrated Work Center Stand – Part number: DL641B</b></p>	<p>Allows mounting of a 15-, 17- or 19-inch HP flat panel monitor and an HP Compaq dc7100 Ultra-slim Desktop PC on a single stand for the convenience of an "all-in-one" form factor. Sold separately. For more information, refer to this product's QuickSpec document</p>
<b>Other</b>	<b>Accessories Included</b>	VGA to VGA cable, DVI-D to DVI-D cable, DVI-I to VGA cable, USB cable, user CD-ROM with Pivot Pro software
	<b>Software</b>	Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese.
	<b>Software</b>	HP Display LiteSaver feature lets you schedule Sleep mode at preset times to help protect the display against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor.
	<b>User Guide Languages</b>	English, Latin America Spanish, Brazilian Portuguese, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Swedish, Greek, Polish, Russian, Slovenian, Turkish, Simplified Chinese, Traditional Chinese, Korean, and Japanese
	<b>Warranty Languages</b>	English, Canadian French, Latin America Spanish, Brazilian Portuguese, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Spanish, Swedish, Bahasa Indonesian, Simplified Chinese, Traditional Chinese, and Korean
	<b>Color</b>	Carbonite, two-tone carbonite and silver (EMEA only)
	<b>VESA Mounting</b>	Yes (swing arm/wall mount not included); base must be removed for mounting options)
	<b>VESA External Mounting</b>	Yes (standard 4 hole pattern, 100 mm)
	<b>Kensington Lock-ready</b>	Yes
<b>Certification and Compliance</b>		Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCC Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 13406-2 Compliant (Pixel Defect Guidelines), Mexican NOM Approval, MPR-II Compliant, PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 99 or 03 depending on region (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft Windows Certification
<b>Compatibility</b>		VESA Video Signal Standard (VSI) Compliant video cards have been tested and proven compatible for use with the HP L1755 Flat Panel Monitor. Recommended for use with HP products.
<b>Service and Warranty</b>		Limited three-year parts and repair labor, service provider labor, and on-site service. Next business day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply. For details, contact HP Customer Support.

### Technical Specifications - Monitors

HP L1955 Flat Panel Monitor	Panel	<b>Type</b>	Active matrix, thin film transistor (TFT)
		<b>Viewable Image Area</b> (diagonal)	19 in (48.25 cm) maximum viewable
		<b>Screen Opening</b> (WxH)	14.9 x 12.0 in (38.0 x 30.5 cm)
		<b>Viewing Angle</b> (typical)	176 degrees horizontal/176 degrees vertical (10:1 minimum contrast ratio)
		<b>Brightness</b> (typical)	Up to 250 nits (cd/m <sup>2</sup> )
		<b>Contrast Ratio</b> (typical)	Up to 1000:1 (typical)
		<b>Response Rate</b> (typical)	<16 ms (typical rise + fall)
		<b>Pixel Pitch</b>	0.294 mm
		<b>Color Depth Support</b>	16.7 million colors
	<b>Video/Other Inputs</b>	<b>Plug and Play</b>	Yes (supports VESA DDC2B; PC2001 compliant)
		<b>Self Powered USB 2.0 Hub</b>	One upstream, four downstream ports (cable included)
		<b>Input Signal</b>	Two connectors: one 15-pin mini D-sub analog VGA; and one DVI-I (VGA analog or digital)
		<b>Input Impedance</b>	75 ohms ± 2%
		<b>Sync Input</b>	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green (activated through on-screen display)
		<b>Video Cable</b>	VGA to VGA, DVI-D to DVI-D, and DVI-I to VGA
		<b>Video Cable Length</b>	78 in (2.0 m)
	<b>Signal Interface/ Performance</b>	<b>Horizontal Frequency</b>	30 to 82 kHz
		<b>Vertical Frequency</b>	56 to 75 Hz
		<b>Native Resolution</b>	1280 x 1024 @ 75 Hz analog 1280 x 1024 @ 60 Hz digital
		<b>Maximum Resolution</b> (Analog)	1280 x 1024 @ 75 Hz analog
		<b>Maximum Resolution</b> (Digital)	1280 x 1024 @ 75 Hz digital
		<b>Preset VESA Graphic Modes</b> (non-interlaced)	640 x 480 @ 60 Hz, 72 Hz, 75 Hz 720 x 400 @ 70 Hz 800 x 600 @ 60 Hz, 72 Hz, 75 Hz 1024 x 768 @ 60 Hz, 70 Hz, 75 Hz 1280 x 1024 @ 60 Hz, 75 Hz
		<b>Preset MAC Mode</b>	832 x 624 @ 75 Hz 1152 x 870 @ 75 Hz
		<b>Preset VGA Mode</b>	640 x 480 @ 60 Hz, 72 Hz
		<b>Preset SUN Mode</b>	1152 x 900 @ 76 Hz
		<b>Fail Safe Mode</b>	Yes (limits out of range signal messages)
		<b>Maximum Pixel Clock Speed</b>	140 MHz
		<b>User Programmable Modes</b>	Yes, 15
		<b>Anti-Glare</b>	Yes
		<b>Anti-Static</b>	Yes
		<b>AssetControl</b>	Yes (accessible on HP Compaq Business Desktops featuring Intelligent Manageability)
		<b>Default Color Temperature</b>	Yes (6500k, 9300k, sRGB, Custom User)
	<b>On Screen Display (OSD) Controls</b>	<b>Buttons or Switches</b>	Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch

### Technical Specifications - Monitors

	<b>Languages</b>	English, Spanish, French, German, Italian, Japanese, Simplified Chinese
	<b>User Controls</b>	Size and Positioning Contrast Brightness Clock, Clock Phase Selectable Color Temperature Serial Number Mode Displayed Sleep Timer Input Selection Factory Reset Individual Color Contrast Full-screen Resolution
<b>Power</b>	<b>Power Supply</b>	Auto-ranging, 90 to 265 VAC; internal power supply
	<b>Input Power</b>	100 ~ 240 VAC
	<b>Nominal Current</b>	1.5 A maximum
	<b>Frequency</b>	50 ~ 60 Hz
	<b>Average</b>	33 watts when displaying standard office software
	<b>Typical Power Consumption</b>	< 40 watts
	<b>Maximum</b>	< 60 watts
	<b>Power Saving</b>	< 2 watts
	<b>Off Mode</b>	0 watts (when master power switch is in the off position)
	<b>Power Cable Length</b>	70 in (1.8 m); non-captive
<b>Mechanical</b>	<b>Dimensions</b> (H x W x D)	<b>Unpacked with stand</b> 16.8 (minimum) to 22.3 (maximum) x 15.9 x 8.3 in (42.7 (minimum) to 56.6 (maximum) x 40.4 x 21.1 cm)
		<b>Base Area</b> 8.3 x 12.2 in (Footprint D x W) (21.1 x 30.9 cm)
		<b>Panel only</b> (without stand) 13.2 x 15.9 x 3.1 in (H x W x D) (33.5 x 40.4 x 7.9 cm)
	<b>Weight</b>	<b>Unpacked with stand</b> 16.5 lb (7.5 kg) <b>Unpacked without stand</b> 10.5 lb (4.75 kg) <b>Packaged</b> 23.5 lb (10.7 kg)
	<b>Bezel Width</b>	13 mm left and right, 14 mm top, and 15 mm bottom
	<b>Tilt Range</b>	-5° to +35°
	<b>Swivel Range</b>	± 50° horizontal swivel
	<b>Height Adjustable</b>	Yes (5.1 in/13 cm adjustment range)
	<b>Pivot Rotation</b>	Yes, 90 °
	<b>Base</b>	Ships detached and is removable after installation
<b>Environmental</b>	<b>Temperature – Operating</b>	41° to 95° F (5° to 35° C)
	<b>Temperature – Non-operating</b>	-4° to 140° F (-20° to 60° C)
	<b>Humidity – Operating</b>	20% to 80%
	<b>Humidity – Non-operating</b>	5% to 95%
	<b>Altitude – Operating</b>	0 to 13,000 ft (0 to 4,000 m)

### Technical Specifications - Monitors

<b>Options</b>	<b>Altitude – Non-operating</b>	0 to 40,000 ft (0 to 12,192 m)
	<b>Desktop Access Center</b>	Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions. Sold separately; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs.
<b>Other</b>	<b>HP Flat Panel Speaker Bar</b>	Powered directly by the monitor, seamlessly attaches to the monitor's bezel to bring full multimedia support to select HP flat panel monitors. Features dual speakers with full sound range and external jack for headphones. Sold separately, part number PF804AA. For more information, refer to the HP Flat Panel Speaker Bar QuickSpecs.
	<b>Accessories Included</b>	VGA to VGA cable, DVI-D to DVI-D cable, DVI-I to VGA cable, USB cable, user CD-ROM with Pivot Pro software
	<b>Software</b>	Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese.
	<b>Software</b>	HP Display LiteSaver feature lets you schedule Sleep mode at preset times to help protect the display against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor.
	<b>User Guide Languages</b>	English
	<b>Warranty Languages</b>	English
	<b>Color</b>	Carbonite, two-tone carbonite and silver (EMEA only)
	<b>VESA Mounting</b>	Yes (swing arm/wall mount not included); base must be removed for mounting options)
<b>Certification and Compliance</b>	<b>VESA External Mounting</b>	Yes (standard 4 hole pattern, 100 mm)
	<b>Kensington Lock-ready</b>	Yes
	Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 13406-2 Compliant (Pixel Defect Guidelines), Mexican NOM Approval, MPR-II Compliant, PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 99 or 03 depending on region (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft® Windows® Certification	
	<b>Compatibility</b>	
<b>Service and Warranty</b>	VESA Video Signal Standard (VSI) Compliant video cards have been tested and proven compatible for use with the HP L1955 Flat Panel Monitor. Recommended for use with HP products.	
Limited three-year parts and repair labor, service provider labor, and on-site service. Next Business Day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply. For details, contact HP Customer Support.		

<b>HP Flat Panel Monitor L2035</b>	<b>Panel</b>	<b>Type</b>	20-inch Active Matrix TFT (thin film transistor)
		<b>Viewable Image Area</b> (diagonal)	20.1 in (51 cm)
		<b>Screen Opening</b> (W x H)	16.2 x 12.17 in (41.1 x 30.9 cm)
		<b>Viewing Angle</b> (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
		<b>Brightness</b> (typical)*	Up to 250 nits (cd/m <sup>2</sup> )



### Technical Specifications - Monitors

	<b>Contrast Ratio (typical)*</b>	Up to 400:1
	<b>Response Rate (typical)*</b>	16 ms (typical, rise + fall)
	<b>Pixel Pitch</b>	0.255 mm
	<b>Color Depth Support</b>	16.7 million colors
	*All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.	
<b>On Screen Display (OSD) Controls</b>	<b>Buttons or Switches</b>	PiP (Picture in Picture), Input select, auto adjust, OSD up, OSD down, OSD menu select, power
	<b>Languages</b>	English, French, German, Spanish, Italian
	<b>User Controls</b>	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
<b>Signal Interface/ Performance</b>	<b>Horizontal Frequency</b>	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
	<b>Vertical Frequency</b>	48 to 85 Hz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
	<b>Graphics Controller</b>	Pixelworks PW171
	<b>Native Resolution</b>	1600 x 1200 @ 60 Hz (recommended)
	<b>Preset VESA Graphic Modes (non-interlaced)</b>	1600 x 1200 @ 60 Hz, 75 Hz (VGA input) 1280 x 1024 @ 60 Hz, 75 Hz, 85 Hz 1280 x 960 @ 60 Hz 1152 x 900 @ 66 Hz 1024 x 768 @ 60 Hz, 75 Hz, 85 Hz 800 x 600 @ 60 Hz, 85 Hz 640 x 480 @ 60 Hz, 75 Hz, 85 Hz
	<b>Text Mode</b>	720 x 400 @ 70 Hz
	<b>Mac Mode</b>	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
	<b>Sun Mode</b>	1152 x 900 @ 66 Hz
	<b>Maximum Pixel Clock Speed</b>	202 MHz (VGA input); 162 MHz (DVI input)
	<b>User Programmable Modes</b>	Yes, 10
	<b>Anti-Glare</b>	Yes
	<b>Anti-Static</b>	Yes
	<b>Default Color Temperature</b>	6500 K
<b>Video Input</b>	<b>Plug and Play Input Signal</b>	Yes Four connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, and one s-video
	<b>Input Impedance</b>	75 ohms ± 10%
	<b>Sync Input</b>	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green
	<b>Video Cable</b>	VGA to VGA; VGA to DVI-I; DVI-D to DVI-I
	<b>Video Cable Length</b>	5.9 ft (1.8 m)
<b>Power</b>	<b>Input Power</b>	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz

## Technical Specifications - Monitors

	<b>Frequency</b>	47.5 to 63 Hz	
	<b>Maximum</b>	< 75 W	
	<b>Power Saving</b>	< 5 W	
	<b>Power Cable Length</b>	5.9 ft (1.8 m)	
<b>Mechanical</b>	<b>Dimensions (H x W x D)</b>	<b>Unpacked with stand</b>	17.36 to 20.9 x 17.8 x 8.27 in (44.1 to 53.1 x 45.2 x 21.0 cm)
		<b>Unpacked without stand (head only)</b>	14.29 x 17.8 x 3.19 in (36.3 x 45.2 x 8.1 cm)
		<b>Packaged</b>	11.5 x 21.9 x 23.9 in (29.2 x 55.6 x 60.6 cm)
	<b>Weight</b>	<b>Unpacked</b>	With stand: 20.28 lb (9.2 kg);
			Without stand: 12.35 lb (5.6 kg)
		<b>Packaged</b>	26.9 lb (12.2 kg)
	<b>Tilt Range</b>	-5° to + 25° vertical	
	<b>Swivel Range</b>	-35° to + 35°	
	<b>Height Adjustable</b>	Yes, range 3.54 in (9.0 cm)	
	<b>Pivot Rotation</b>	Yes	
<b>Environmental</b>	<b>Base</b>	Attached	
	<b>Temperature – Operating</b>	46° to 95° F (10° to 35° C)	
	<b>Temperature – Non-operating</b>	6° to 140° F (-10° to 60° C)	
	<b>Humidity – Operating</b>	20% to 80% non-condensing	
	<b>Humidity – Non-operating</b>	5% to 85%	
	<b>Altitude – Operating</b>	+12,000 ft (+3,657.6 m)	
	<b>Altitude – Non-operating</b>	+40,000 ft (+12,192 m)	

### Technical Specifications - Monitors

<b>Options</b>	<b>HP Desktop Access Center</b>	Sold separately, the HP Desktop Access Center features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs.
<b>Other</b>	<b>Accessories Included</b>	VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector
	<b>User Guide Languages</b>	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	<b>Warranty Languages</b>	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
	<b>Color</b>	Carbonite/Silver
	<b>VESA External Mounting</b>	Yes (Standard 4 hole pattern, 100 mm)
	<b>Kensington Lock-Ready</b>	Yes
<b>Certification and Compliance</b>		Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, *Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification (Microsoft® Windows® 98, Microsoft Windows 2000, and Microsoft Windows XP) <a href="#">* Energy Star Compliant available summer 2004.</a>
<b>Service and Warranty</b>		Limited three years parts, labor, and on-site service, including backlight. Availability varies by region. Certain restrictions and exclusions apply. Consult HP Customer Service for details.

### Technical Specifications - Monitors

HP Flat Panel Monitor    Panel  
L2335

<b>Type</b>	23-inch Active Matrix TFT (thin film transistor)
<b>Viewable Image Area</b> (diagonal)	23 in (58.4 cm)
<b>Screen Opening</b> (W x H)	19.53 x 12.24 in (49.6 x 31.1 cm)
<b>Viewing Angle</b> (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
<b>Brightness</b> (typical)*	Up to 250 nits (cd/m <sup>2</sup> )
<b>Contrast Ratio</b> (typical)*	Up to 500:1
<b>Response Rate</b> (typical)*	16 ms (typical, rise + fall)
<b>Pixel Pitch</b>	0.258 mm
<b>Color Depth Support</b>	16.7 million colors

\* All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.

**On Screen Display (OSD) Controls**

<b>Buttons or Switches</b>	PiP (Picture in Picture), Input Select, Auto Adjust, OSD Up, OSD Down, OSD Menu Select, Power
<b>Languages</b>	English, French, German, Spanish, Italian
<b>User Controls</b>	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset

**Signal Interface/ Performance**

<b>Horizontal Frequency</b>	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
<b>Vertical Frequency</b>	48 to 85 Hz (VGA and DVI input)
<b>Graphics Controller</b>	Pixelworks PW172
<b>Native Resolution</b>	1920 x 1200 @ 60 Hz (recommended)
<b>Preset VESA Graphic Modes</b> (non-interlaced)	1920 x 1200 @ 60Hz 1600 x 1200 @ 60 Hz, 75 Hz 1280 x 1024 @ 60 Hz, 75Hz, 85 Hz 1280 x 960 @ 60 Hz 1152 x 900 @ 66 Hz 1024 x 768 @ 60 Hz, 75 Hz, 85 Hz 800 x 600 @ 60 Hz, 75Hz 640 x 480 @ 60 Hz, 75 Hz
<b>Text Mode</b>	720 x 400 @ 70 Hz
<b>Mac Mode</b>	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
<b>Sun Mode</b>	1152 x 900 @ 66 Hz
<b>Maximum Pixel Clock Speed</b>	202 MHz (VGA input); 162 MHz (DVI input)
<b>User Programmable Modes</b>	Yes, 10
<b>Anti-Glare</b>	Yes
<b>Anti-Static</b>	Yes
<b>Default Color Temperature</b>	6500 K

### Technical Specifications - Monitors

Video Input	<b>Plug and Play</b>	Yes
	<b>Input Signal</b>	Five connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, one s-video, component video
	<b>Input Impedance</b>	75 ohms $\pm$ 10%
	<b>Sync Input</b>	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green
	<b>Video Cable</b>	VGA to VGA; VGA to DVI-I; DVI-D to DVI-I
Power	<b>Video Cable Length</b>	5.9 ft (1.8 m)
	<b>Input Power</b>	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz
	<b>Frequency</b>	47.5 to 63 Hz
	<b>Maximum</b>	< 100 W
	<b>Power Saving</b>	< 5 W
Mechanical	<b>Power Cable Length</b>	5.9 ft (1.8 m)
	<b>Dimensions (H x W x D)</b>	<b>Unpacked</b> 17.36 (min) to 20.9 (max) x 21.46 x 8.27 in (44.1 (min) to 53.1 (max) x 54.5 x 21.0 cm)
		<b>Unpacked without stand (head only)</b> 14.57 x 21.46 x 3.35 in (37.0 x 54.5 x 8.5 cm)
		<b>Packaged</b> 11.5 x 25.75 x 23.86 in (29.2 x 65.4 x 60.6 cm)
	<b>Weight</b>	<b>Unpacked</b> 22.27 lb (10.1 kg)
		<b>Packaged</b> 30.87 lb (14.0 kg)
	<b>Tilt Range</b>	-5° to + 25° vertical
	<b>Swivel Range</b>	-35° to + 35°
	<b>Height Adjustable</b>	Yes, range 3.54 in (9.0 cm)
	<b>Pivot Rotation</b>	Yes
Environmental	<b>Base</b>	Attached
	<b>Temperature – Operating</b>	46° to 95° F (10° to 35° C)
	<b>Temperature – Non-operating</b>	6° to 140° F (-10° to 60° C)
	<b>Humidity – Operating</b>	20% to 80% non-condensing
	<b>Humidity – Non-operating</b>	5% to 85%
	<b>Altitude – Operating</b>	+12,000 ft (+3,657.6 m)
	<b>Altitude – Non-operating</b>	+40,000 ft (+12,192 m)
	<b>Options</b>	<b>HP Desktop Access Center</b> Sold separately, the HP Desktop Access Center Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs.

### Technical Specifications - Monitors

<b>Other</b>	<b>Accessories Included</b>	<p>VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector</p> <p>VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector</p> <p>DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector</p>
	<b>User Guide Languages</b>	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	<b>Warranty Languages</b>	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
	<b>Color</b>	Carbonite/silver
	<b>VESA External Mounting</b>	Yes (Standard 4 hole pattern, 100 mm)
	<b>Kensington Lock-Ready</b>	Yes
<b>Certification and Compliance</b>		<p>Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, *Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification (Microsoft® Windows® 98, Microsoft Windows 2000, and Microsoft Windows XP).</p> <p><a href="#">* Energy Star Compliant available summer 2004.</a></p>
<b>Service and Warranty</b>		Limited three years parts, labor, and on-site service, including backlight. Availability varies by region. Certain restrictions and exclusions apply. Consult HP Customer Service for details.

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