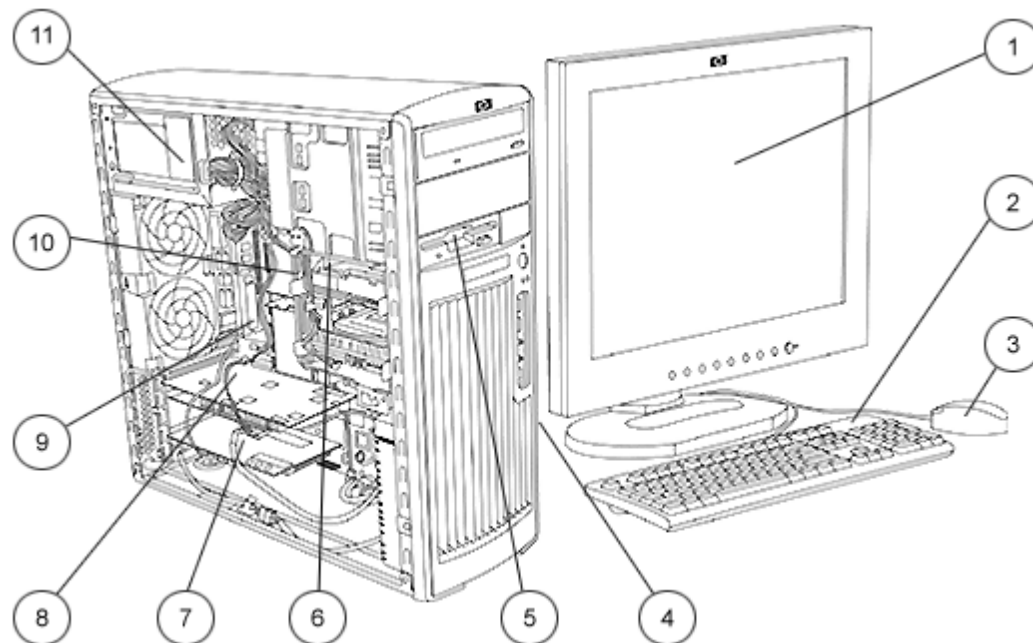


## Overview



1. Monitor (sold separately)
2. 2004 Standard Keyboard
3. 2-Button Scroll Mouse
4. Front IO: 2 USB 2.0, IEEE-1394 (requires optional PCI card to enable), headphone and microphone
5. 3.5" external bay for optional diskette drive or other 3.5" device
6. 2 internal 3.5" bays, 2 external 5.25" bays
7. 4 PCI, 1 PCI Express 8x prime slots
8. 1 PCI Express x16 Graphics Bus
9. 6 USB 2.0, 1 standard serial port, 1 parallel port, 2 PS/2, 1 RJ-45, audio in/out
10. Dual 64-bit Intel® Xeon™ processors
11. 500 watt power supply

## At A Glance

- 64-bit Intel® Xeon™ processors
- Choice of operating systems: Microsoft Windows XP Professional, XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3, HP Linux Installer Kit (see <http://www.hp.com/workstations/software/linux/> for details)
- Up to 8 GB of DDR-2 memory
- PCI-Express I/O and graphics
- Integrated Broadcom NetXtreme Gigabit ethernet
- 800 MHz processor front side bus support
- 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>64-bit Intel Xeon Processor with 800 MHz Front Side Bus</b> 2.8 GHz (1 MB L2 cache) 2.8 GHz (2 MB L2 cache) 3.0 GHz (1 MB L2 cache) 3.0 GHz (2 MB L2 cache) 3.2 GHz (1 MB L2 cache) 3.2 GHz (2 MB L2 cache) 3.4 GHz (1 MB L2 cache) 3.4 GHz (2 MB L2 cache) 3.6 GHz (1 MB L2 cache) 3.6 GHz (2 MB L2 cache) 3.8 GHz (2 MB L2 cache)  <b>2nd 64-bit Intel Xeon Processor with 800 MHz Front Side Bus</b> (optional – speed must match processor 1) 2.8 GHz (1 MB L2 cache) 2.8 GHz (2 MB L2 cache) 3.0 GHz (1 MB L2 cache) 3.0 GHz (2 MB L2 cache) 3.2 GHz (1 MB L2 cache) 3.2 GHz (2 MB L2 cache) 3.4 GHz (1 MB L2 cache) 3.4 GHz (2 MB L2 cache) 3.6 GHz (1 MB L2 cache) 3.6 GHz (2 MB L2 cache) 3.8 GHz (2 MB L2 cache)
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<b>Operating System –</b> One of the following	Microsoft Windows XP Professional Microsoft Windows XP Professional x64 Edition ( <a href="http://www.hp.com/workstations/pws/windowsxp64/">http://www.hp.com/workstations/pws/windowsxp64/</a> ) Red Hat Enterprise Linux Workstation 3 64-bit version (Update 2 in 32- and 64-bit available as aftermarket option) HP Installer Kit for Linux (includes drivers for both 32-bit & 64-bit OS versions) <b>NOTE:</b> Although HP Personal Workstations can be ordered with the HP Installer Kit for Linux and an IEEE 1394 card, HP cannot provide customer support for this configuration. Please refer to the Linux Hardware Support Matrix ( <a href="http://www.hp.com/support/linux_hardware_matrix">http://www.hp.com/support/linux_hardware_matrix</a> ) for details, and to the Linux User Manual ( <a href="http://www.hp.com/support/linux_user_manual">http://www.hp.com/support/linux_user_manual</a> ) for tips on user-enablement of the IEEE 1394 Card.
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### Standard Features - Custom Components

1st Hard Disk Drive – One of the following	Serial ATA 3.0-Gb/s Hard Drives (Currently supported only at 1.5-Gb/s. To get 3Gb/s performance, a SATA 3.0-Gb/s controller must be added)	Windows XP	Red Hat Linux
	80 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	160 GB 7200 rpm Serial ATA NCQ drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	250 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	500 GB 7200 rpm Serial ATA NCQ drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	<b>Serial ATA 1.5Gb/s Hard Drives</b>		
	250 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	400 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	74 GB 10K rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	<b>Ultra320 SCSI Hard Drives</b>		
	73 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	146 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	300 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	36 GB 15K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	73 GB 15K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
<b>2nd Hard Disk Drive – One of the following</b>	<b>Serial ATA 3Gb/s Hard Drives</b>		
	2nd hard drive, 80 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	2nd hard drive, 160 GB 7200 rpm Serial ATA NCQ drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	2nd hard drive, 250 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	2nd hard drive, 500 GB 7200 rpm Serial ATA NCQ drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	<b>Serial ATA 1.5Gb/s Hard Drives</b>		
	2nd hard drive, 250 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	2nd hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	2nd hard drive, 74 GB 10K rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	<b>Ultra320 SCSI Hard Drives</b>		
	2nd hard drive, 73 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	2nd hard drive, 146 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	2nd hard drive, 300 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	2nd hard drive, 36 GB 15K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	2nd hard drive, 73 GB 15K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4

## Standard Features - Custom Components

3rd Hard Disk Drive – One of the following	Serial ATA 3Gb/s Hard Drives		
	3rd hard drive, 80 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	3rd hard drive, 160 GB 7200 rpm Serial ATA NCQ drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	3rd hard drive, 250 GB 7200 rpm Serial ATA drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	3rd hard drive, 500 GB 7200 rpm Serial ATA NCQ drive (8 MB cache)	32-Bit, 64-Bit	WS3, WS4
	3rd hard drive, 73 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	3rd hard drive, 146 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	3rd hard drive, 300 GB 10K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	3rd hard drive, 36 GB 15K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	3rd hard drive, 73 GB 15K Ultra320 SCSI drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4

Factory Integrated RAID	RAID 0 Configuration – Striped Array	32-Bit	
	RAID 1 Configuration – Mirrored Array	32-Bit	
	Adaptec 1420 4Prt 3Gb PCI SATA RAID Card	32-Bit, 64-Bit	WS3, WS4
	<b>NOTE:</b> Requires 2 identical hard drives (speeds, capacity, interface)		

Drive controllers	Integrated serial ATA controller		
	Optional Ultra 320 SCSI controller (required if HDs are SCSI) - basic		
	Optional Ultra 320 SCSI controller (required if HDs are SCSI) - advanced, with RAID support and external connector		

## Standard Features - Custom Components

Memory -		Windows XP	Red Hat Linux
One of the following	256 MB DDR-2 PC2-3200 (400 MHz) ECC Registered (1 x 256 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	512 MB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 256 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 512 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1 GB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 512 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	3 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1 GB + 2 x 512 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 2 GB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 1 GB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	6 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 2 GB + 2 x 1 GB)	64-Bit	7.2, 7.3, WS3, WS4
	8 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 2 GB)	64-Bit	7.2, 7.3, WS3, WS4

Removable Storage		Windows XP	Red Hat Linux
	1.44-MB Diskette Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	48X CD-ROM Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	48X/32X/48X CD-RW Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	16X/40X DVD-ROM Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	16X DVD+/-RW, Dual-Layer LightScribe	32-Bit	

2nd Removable Storage			
	48X/32X/48X CD-RW Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	16X/40X DVD-ROM Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	16X DVD+/-RW, Dual-Layer LightScribe	32-Bit	

### Standard Features - Custom Components

<b>Keyboard -</b> One of the following	PS/2 Standard Keyboard	Windows XP 32-Bit, 64-Bit	Red Hat Linux 7.2, 7.3, WS3, WS4
	USB Standard Keyboard	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
<b>Mouse -</b> One of the following	PS/2 2-Button Scroll Mouse	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	PS/2 3-Button Mouse	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	USB 2-Button Optical Scroll Mouse	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	USB 3-Button Optical Mouse	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
<b>Audio</b>	Integrated Digital AC97 audio with internal speaker		
	Sound Blaster Audigy 2 ZS PCI	32-Bit	
	Sound Blaster® X-Fi™ XtremeMusic PCI	32-Bit, 64-Bit	
	HP Optical Drive Internal Audio Cable	32-Bit, 64-Bit	
<b>NIC</b>	Broadcom BCM5751 NetXtreme™ Gigabit Ethernet Controller (PCI-E)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI - up to 2 of these two cards can be integrated in the factory)	Windows XP 32-Bit, 64-Bit	Red Hat Linux 7.2, 7.3, WS3, WS4
	NVIDIA Quadro NVS 285 PCI Express (128 MB, VGA & DVI)	32-Bit, 64-Bit	WS3, WS4
	NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI)	32-Bit, 64-Bit	
	NVIDIA Quadro NVS 280 PCI Express (64 MB, VGA & DVI)	32-Bit, 64-Bit	
	ATI FireGL V3100 PCI Express (128 MB)	32-Bit, 64-Bit	
	NVIDIA Quadro FX 540 PCI Express (128 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	NVIDIA Quadro FX 1400 PCI Express (128 MB)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	ATI FireGL V5100 PCI Express (128 MB) NVIDIA Quadro FX 3450 PCI Express (256 MB)	32-Bit, 64-Bit 32-Bit, 64-Bit	7.2, 7.3, WS3, WS4

## Standard Features - Custom Components

Miscellaneous	Solenoid lock and hood sensor	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4
	IEEE 1394 PCI Card	32-Bit, 64-Bit	
	Trusted Platform Module	32-Bit	
	HP 64-bit Transition Tool Kit	32-Bit, 64-Bit	
<hr/>			
Software	Symantec Norton AntiVirus (optional)*	32-Bit	
	HP Performance Tuning Framework*	32-Bit, 64-Bit	
	Altiris Recovery*	32-Bit	
	HP Client Manager Software v6.0*	32-Bit	
	* Not available with Linux Operating System		

## Standard Features - Specs

Operating System (choice)	Microsoft Windows XP Professional	
	Windows XP Professional x64 Edition ( <a href="http://www.hp.com/workstations/pws/windowsxp64/">http://www.hp.com/workstations/pws/windowsxp64/</a> )	
	OR Red Hat Enterprise Linux Workstation 3 Update 5 (64-bit only)	
	OR HP Installer Kit for Linux (includes drivers for both 32-bit & 64-bit OS versions on HP xw8200, xw6200 and xw4200)	
Form factor	Minitower	
Color	Carbonite/Alloy metallic	
System Board Form Factor	Non-standard ATX	
Processor	Single or dual 64-bit Intel Xeon processors (Nocona) with Hyper-Threading Technology	
CPU Bus Speed Supported	800 MHz FSB	
Standard L2 Cache	1 MB or 2 MB L2 cache	
Chipset	Intel E7525	
Memory Expansion Slots	4 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 (4 DIMMs slots, 2 GB DIMMs required to meet maximum configurations)	
Network controller	Integrated Broadcom 5751 10/100/1000 for HP	
Audio	Integrated AC'97 digital audio with S/PDif 6-channel pass-through, stereo microphone, and Yamaha XG Lite Softsynth support	
PCI slots	4 PCI slots (full-height) 1 PCI Express (x8 mechanically, x4 electrically) 1 PCI Express x16 graphics	
AGP slot	none	
Bays	Total Bays = 5	
Internal Bays	<ul style="list-style-type: none"> <li>Two 3.5 inch bays with acoustic dampening rail assemblies</li> </ul>	
External Bays	<ul style="list-style-type: none"> <li>Two 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 inch 3rd Hard Drive bay using optional bracket</li> <li>One 3.5 inch bay for optional floppy drive</li> </ul>	
Parallel Port	1	
Serial Port	1	
Front I/O	2 USB 2.0, Headphone, Microphone, optional IEEE 1394 <b>NOTE:</b> Although HP Personal Workstations can be ordered with the HP Installer Kit for Linux and an IEEE 1394 card, HP cannot provide customer support for this configuration. Please refer to the Linux Hardware Support Matrix ( <a href="http://www.hp.com/support/linux_hardware_matrix">http://www.hp.com/support/linux_hardware_matrix</a> ) for details, and to the Linux User Manual ( <a href="http://www.hp.com/support/linux_user_manual">http://www.hp.com/support/linux_user_manual</a> ) for tips on user-enablement of the IEEE 1394 Card.	
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)	17.3 x 6.5 X 17.3 in (44.1 x 16.5 x 44.0 cm)	
System weight	Standard config – 35 lb	
Shipping weight	Varies by region	
Temperature	Operating	40° to 95° F (5° to 35° C)
	Non-operating	-40° to 140° F (-40° to 60° C)



## Standard Features - Specs

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	500W wide-ranging, active Power Factor Correction	
Interfaces Supported	1 SATA interface (2 serial-ATA connectors), 1 EIDE interface (2 EIDE connectors) for optical drives, optional multi-bay interface	
Hard Drive Controller (PCI) Supported	Ultra160 or Ultra320, or SATA RAID, or Ultra320 RAID	
<b>Preinstalled Software</b>		
HP Client Manager Software v6.0*		
Altiris Local Recovery*		
Alert Standard Format specification*		
Norton AntiVirus 2004 (optional preinstall)*		
CD/DVD software dependent on optical drive choices		
* <a href="#">Not available on Linux</a>		

## Standard Features - Preconfigured Global Models

xw6200X/XE2.8/B80/ H1.0/285/dF/s	<b>Processor</b>	64-bit Intel Xeon processor 2.80 GHz 2 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	2 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 3.0-Gb/s 7200 rpm (1st)
	<b>HDD Controller</b>	Serial ATA controller
	<b>Floppy Drive</b>	1.44MB 3.5" Floppy Drive
	<b>Graphics</b>	NVIDIA Quadro NVS 285 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Keyboard</b>	Standard PS/2 Keyboard
	<b>Other Integrated</b>	Broadcom 10/100/1000 GBIT LOM, and AC97 audio

### xw6200X/XE2.8/B80/H1.0/285/dF/s Country Code Key

N. America	EN557AW#ABA	Switzerland (German/French)	EN557AW#AR8
Fr. Canadian	EN557AW#ABC	Switzerland (Italian/English)	EN557AW#ACN
L. America	EN557AW#ABM	Dutch	EN557AW#ABH
Japan (English)	EN557AW#ACF	Denmark	EN557AW#ACE
Japan (Japanese)	EN557AW#ABJ	Asia/Pacific (English)	EN557AW#AB4
UK	EN557AW#ABU	Korea	EN557AW#AB1
Germany	EN557AW#ABD	China	EN557AW#AB2
France	EN557AW#ABF	Taiwan	EN557AW#AB0
Italy	EN557AW#ABZ	India	EN557AW#ACJ
Spain	EN557AW#ABE	Australia	EN557AW#ABG
Europe	EN557AW#AK6	Thailand	EN557AW#AKL
Russia	EN557AW#ACB		

xw6200X/XE3.2+/B80/ H1.0/285/dF/s	<b>Processor</b>	64-bit Intel Xeon processor 3.2 GHz 2 MB/800
	<b>2nd Processor</b>	64-bit Intel Xeon processor 3.2 GHz 2 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	2 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 3.0-Gb/s 7200 rpm (1st)
	<b>HDD Controller</b>	Serial ATA controller
	<b>Floppy Drive</b>	1.44MB 3.5" Floppy Drive
	<b>Graphics</b>	NVIDIA Quadro NVS 285 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Keyboard</b>	Standard PS/2 Keyboard
	<b>Other Integrated</b>	Broadcom 10/100/1000 GBIT LOM, and AC97 audio

## Standard Features - Preconfigured Global Models

### xw6200X/XE3.2+/B80/H1.0/285/dF/s Country Code Key

N. America	EN558AW#ABA	Switzerland (German/French)	EN558AW#AR8
Fr. Canadian	EN558AW#ABC	Switzerland (Italian/English)	EN558AW#ACN
L. America	EN558AW#ABM	Dutch	EN558AW#ABH
Japan (English)	EN558AW#ACF	Denmark	EN558AW#ACE
Japan (Japanese)	EN558AW#ABJ	Asia/Pacific (English)	EN558AW#AB4
UK	EN558AW#ABU	Korea	EN558AW#AB1
Germany	EN558AW#ABD	China	EN558AW#AB2
France	EN558AW#ABF	Taiwan	EN558AW#AB0
Italy	EN558AW#ABZ	India	EN558AW#ACJ
Spain	EN558AW#ABE	Australia	EN558AW#ABG
Europe	EN558AW#AK6	Thailand	EN558AW#AKL
Russia	EN558AW#ACB		

xw6200X/XE3.2+/S73b/H1.0/285/dF/p	<b>Processor</b>	64-bit Intel Xeon processor 3.2 GHz 2 MB/800
	<b>2nd Processor</b>	64-bit Intel Xeon processor 3.2 GHz 2 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	2 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	73 GB SCSI 10k rpm (1st)
	<b>HDD Controller</b>	U320 SCSI Controller (No RAID)
	<b>Floppy Drive</b>	1.44MB 3.5" Floppy Drive
	<b>Graphics</b>	NVIDIA Quadro NVS 285 PCI Express included in base configuration.
	<b>Mouse</b>	HP optical scroll mouse (USB)
	<b>Keyboard</b>	Standard PS/2 Keyboard
<b>Other Integrated</b>	Broadcom 10/100/1000 GBIT LOM, and AC97 audio	

### xw6200X/XE3.2+/S73b/H1.0/285/dF/p Country Code Key

N. America	EN559AW#ABA	Switzerland (German/French)	EN559AW#AR8
Fr. Canadian	EN559AW#ABC	Switzerland (Italian/English)	EN559AW#ACN
L. America	EN559AW#ABM	Dutch	EN559AW#ABH
Japan (English)	EN559AW#ACF	Denmark	EN559AW#ACE
Japan (Japanese)	EN559AW#ABJ	Asia/Pacific (English)	EN559AW#AB4
UK	EN559AW#ABU	Korea	EN559AW#AB1
Germany	EN559AW#ABD	China	EN559AW#AB2
France	EN559AW#ABF	Taiwan	EN559AW#AB0
Italy	EN559AW#ABZ	India	EN559AW#ACJ
Spain	EN559AW#ABE	Australia	EN559AW#ABG
Europe	EN559AW#AK6	Thailand	EN559AW#AKL
Russia	EN559AW#ACB		

## Standard Features - Preconfigured Global Models

<b>xw6200X/XE3.2+/D80/H2.0/285/d/s</b>	<b>Processor</b>	64-bit Intel Xeon processor 3.2 GHz 2 MB/800
	<b>2nd Processor</b>	64-bit Intel Xeon processor 3.2 GHz 2 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	2 MB L2
	<b>Memory</b>	2 GB (2x1) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 3.0-Gb/s 7200 rpm (1st)
	<b>HDD Controller</b>	Serial ATA controller
	<b>Floppy Drive</b>	None
	<b>Graphics</b>	NVIDIA Quadro NVS 285 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Keyboard</b>	Standard PS/2 Keyboard
	<b>Other Integrated</b>	Broadcom 10/100/1000 GBIT LOM, and AC97 audio

### xw6200X/XE3.2+/D80/H2.0/285/d/s Country Code Key

<b>N. America</b>	EQ644AW#ABA	<b>Switzerland (German/French)</b>	EQ644AW#AR8
<b>Fr. Canadian</b>	EQ644AW#ABC	<b>Switzerland (Italian/English)</b>	EQ644AW#ACN
<b>L. America</b>	EQ644AW#ABM	<b>Dutch</b>	EQ644AW#ABH
<b>Japan (English)</b>	EQ644AW#ACF	<b>Denmark</b>	EQ644AW#ACE
<b>Japan (Japanese)</b>	EQ644AW#ABJ	<b>Asia/Pacific (English)</b>	EQ644AW#AB4
<b>UK</b>	EQ644AW#ABU	<b>Korea</b>	EQ644AW#AB1
<b>Germany</b>	EQ644AW#ABD	<b>China</b>	EQ644AW#AB2
<b>France</b>	EQ644AW#ABF	<b>Taiwan</b>	EQ644AW#AB0
<b>Italy</b>	EQ644AW#ABZ	<b>India</b>	EQ644AW#ACJ
<b>Spain</b>	EQ644AW#ABE	<b>Australia</b>	EQ644AW#ABG
<b>Europe</b>	EQ644AW#AK6	<b>Thailand</b>	EQ644AW#AKL
<b>Russia</b>	EQ644AW#ACB		

<b>xw6200X/XE3.4+/C74/H2.0/285/dF/s</b>	<b>Processor</b>	64-bit Intel Xeon processor 3.4 GHz 2 MB/800
	<b>2nd Processor</b>	64-bit Intel Xeon processor 3.4 GHz 2 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	2 MB L2
	<b>Memory</b>	2 GB (2x1) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 10k rpm (1st)
	<b>HDD Controller</b>	Serial ATA controller
	<b>Floppy Drive</b>	1.44MB 3.5" Floppy Drive
	<b>Graphics</b>	NVIDIA Quadro NVS 285 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Keyboard</b>	Standard PS/2 Keyboard
	<b>Other Integrated</b>	Broadcom 10/100/1000 GBIT LOM, and AC97 audio

## Standard Features - Preconfigured Global Models

### xw6200X/XE3.4+/C74/H2.0/285/dF/s Country Code Key

N. America	EN560AW#ABA	Switzerland (German/French)	EN560AW#AR8
Fr. Canadian	EN560AW#ABC	Switzerland (Italian/English)	EN560AW#ACN
L. America	EN560AW#ABM	Dutch	EN560AW#ABH
Japan (English)	EN560AW#ACF	Denmark	EN560AW#ACE
Japan (Japanese)	EN560AW#ABJ	Asia/Pacific (English)	EN560AW#AB4
UK	EN560AW#ABU	Korea	EN560AW#AB1
Germany	EN560AW#ABD	China	EN560AW#AB2
France	EN560AW#ABF	Taiwan	EN560AW#AB0
Italy	EN560AW#ABZ	India	EN560AW#ACJ
Spain	EN560AW#ABE	Australia	EN560AW#ABG
Europe	EN560AW#AK6	Thailand	EN560AW#AKL
Russia	EN560AW#ACB		

### xw6200X/XE3.6+/C74/H2.0/285/d/p

<b>Processor</b>	64-bit Intel Xeon processor 3.6 GHz 2 MB/800
<b>2nd Processor</b>	64-bit Intel Xeon processor 3.6 GHz 2 MB/800
<b>OS</b>	Microsoft Windows XP Professional
<b>Cache Memory</b>	2 MB L2
<b>Memory</b>	2 GB (2x1) DDR2-400 ECC Registered
<b>Optical Drive</b>	16X DVD-ROM
<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 10k rpm (1st)
<b>Graphics</b>	NVIDIA Quadro NVS 285 PCI Express included in base configuration.
<b>Mouse</b>	HP optical scroll mouse (USB)
<b>Keyboard</b>	Standard PS/2 Keyboard
<b>Other Integrated</b>	Broadcom 10/100/1000 GBIT LOM, AC97 audio, and Serial ATA controller

### xw6200X/XE3.6+/C74/H2.0/285/d/p Country Code Key

N. America	EQ648AW#ABA	Switzerland (German/French)	EQ648AW#AR8
Fr. Canadian	EQ648AW#ABC	Switzerland (Italian/English)	EQ648AW#ACN
L. America	EQ648AW#ABM	Dutch	EQ648AW#ABH
Japan (English)	EQ648AW#ACF	Denmark	EQ648AW#ACE
Japan (Japanese)	EQ648AW#ABJ	Asia/Pacific (English)	EQ648AW#AB4
UK	EQ648AW#ABU	Korea	EQ648AW#AB1
Germany	EQ648AW#ABD	China	EQ648AW#AB2
France	EQ648AW#ABF	Taiwan	EQ648AW#AB0
Italy	EQ648AW#ABZ	India	EQ648AW#ACJ
Spain	EQ648AW#ABE	Australia	EQ648AW#ABG
Europe	EQ648AW#AK6	Thailand	EQ648AW#AKL
Russia	EQ648AW#ACB		

## Standard Features - Preconfigured Global Models

xw6200X/XD2.8/B80/ H1.0/280E/dF/s	<b>Processor</b>	64-bit Intel Xeon processor 2.80 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 1.5-GB/S 7200 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

### xw6200X/XD2.8/B80/H1.0/280E/dF/s Country Code Key

N. America	PD896AW#ABA	Switzerland (German/French)	PD896AW#AR8
Fr. Canadian	PD896AW#ABC	Switzerland (Italian/English)	PD896AW#ACN
L. America	PD896AW#ABM	Dutch	PD896AW#ABH
Japan (English)	PD896AW#ACF	Denmark	PD896AW#ACE
Japan (Japanese)	PD896AW#ABJ	Asia/Pacific (English)	PD896AW#AB4
UK	PD896AW#ABU	Korea	PD896AW#AB1
Germany	PD896AW#ABD	China	PD896AW#AB2
France	PD896AW#ABF	Taiwan	PD896AW#AB0
Italy	PD896AW#ABZ	India	PD896AW#ACJ
Spain	PD896AW#ABE	Australia	PD896AW#ABG
Europe	PD896AW#AK6	Thailand	PD896AW#AKL

xw6200X/XD3.2/C74/ H1.0/280E/dF/s	<b>Processor</b>	64-bit Intel Xeon processor 3.20 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 10,000 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

## Standard Features - Preconfigured Global Models

### xw6200X/XD3.2/C74/H1.0/280E/dF/s Country Code Key

N. America	PM199AW#ABA	Switzerland (German/French)	PM199AW#AR8
Fr. Canadian	PM199AW#ABC	Switzerland (Italian/English)	PM199AW#ACN
L. America	PM199AW#ABM	Dutch	PM199AW#ABH
Japan (English)	PM199AW#ACF	Denmark	PM199AW#ACE
Japan (Japanese)	PM199AW#ABJ	Asia/Pacific (English)	PM199AW#AB4
UK	PM199AW#ABU	Korea	PM199AW#AB1
Germany	PM199AW#ABD	China	PM199AW#AB2
France	PM199AW#ABF	Taiwan	PM199AW#AB0
Italy	PM199AW#ABZ	India	PM199AW#ACJ
Spain	PM199AW#ABE	Australia	PM199AW#ABG
Europe	PM199AW#AK6	Thailand	PM199AW#AKL

xw6200X/XD3.2+/B80/H1.0/280E/dF/s	<b>Processor</b>	Dual 64-bit Intel Xeon processors 3.20 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2 per processor
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 1.5-GB/S 7200 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

### xw6200X/XD3.2+/B80/H1.0/280E/dF/s Country Code Key

N. America	PD898AW#ABA	Switzerland (German/French)	PD898AW#AR8
Fr. Canadian	PD898AW#ABC	Switzerland (Italian/English)	PD898AW#ACN
L. America	PD898AW#ABM	Dutch	PD898AW#ABH
Japan (English)	PD898AW#ACF	Denmark	PD898AW#ACE
Japan (Japanese)	PD898AW#ABJ	Asia/Pacific (English)	PD898AW#AB4
UK	PD898AW#ABU	Korea	PD898AW#AB1
Germany	PD898AW#ABD	China	PD898AW#AB2
France	PD898AW#ABF	Taiwan	PD898AW#AB0
Italy	PD898AW#ABZ	India	PD898AW#ACJ
Spain	PD898AW#ABE	Australia	PD898AW#ABG
Europe	PD898AW#AK6	Thailand	PD898AW#AKL

## Standard Features - Preconfigured Global Models

<b>xw6200X/XD3.4/C74/ H1.0/280E/dF/s</b>	<b>Processor</b>	64-bit Intel Xeon processor 3.40 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 10,000 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

### xw6200X/XD3.4/C74/H1.0/280E/dF/s Country Code Key

<b>N. America</b>	PM200AW#ABA	<b>Switzerland (German/French)</b>	PM200AW#AR8
<b>Fr. Canadian</b>	PM200AW#ABC	<b>Switzerland (Italian/English)</b>	PM200AW#ACN
<b>L. America</b>	PM200AW#ABM	<b>Dutch</b>	PM200AW#ABH
<b>Japan (English)</b>	PM200AW#ACF	<b>Denmark</b>	PM200AW#ACE
<b>Japan (Japanese)</b>	PM200AW#ABJ	<b>Asia/Pacific (English)</b>	PM200AW#AB4
<b>UK</b>	PM200AW#ABU	<b>Korea</b>	PM200AW#AB1
<b>Germany</b>	PM200AW#ABD	<b>China</b>	PM200AW#AB2
<b>France</b>	PM200AW#ABF	<b>Taiwan</b>	PM200AW#AB0
<b>Italy</b>	PM200AW#ABZ	<b>India</b>	PM200AW#ACJ
<b>Spain</b>	PM200AW#ABE	<b>Australia</b>	PM200AW#ABG
<b>Europe</b>	PM200AW#AK6	<b>Thailand</b>	PM200AW#AKL

<b>xw6200X/XD3.4+/B80/ H1.0/280E/dF/s</b>	<b>Processor</b>	Dual 64-bit Intel Xeon processors 3.40 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2 per processor
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 1.5-GB/S 7200 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard



## Standard Features - Preconfigured Global Models

### xw6200X/XD3.4+/B80/H1.0/280E/dF/s Country Code Key

N. America	PD900AW#ABA	Switzerland (German/French)	PD900AW#AR8
Fr. Canadian	PD900AW#ABC	Switzerland (Italian/English)	PD900AW#ACN
L. America	PD900AW#ABM	Dutch	PD900AW#ABH
Japan (English)	PD900AW#ACF	Denmark	PD900AW#ACE
Japan (Japanese)	PD900AW#ABJ	Asia/Pacific (English)	PD900AW#AB4
UK	PD900AW#ABU	Korea	PD900AW#AB1
Germany	PD900AW#ABD	China	PD900AW#AB2
France	PD900AW#ABF	Taiwan	PD900AW#AB0
Italy	PD900AW#ABZ	India	PD900AW#ACJ
Spain	PD900AW#ABE	Australia	PD900AW#ABG
Europe	PD900AW#AK6	Thailand	PD900AW#AKL

xw6200X/XD3.4+/C74/ H2/280E/dF/s	<b>Processor</b>	Dual 64-bit Intel Xeon processors 3.40 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2 per processor
	<b>Memory</b>	2 GB (2x1 GB) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 7200 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard	

### xw6200X/XD3.4+/B80/H1.0/280E/dF/s Country Code Key

N. America	PR845AW#ABA	Switzerland (German/French)	PR845AW#AR8
Fr. Canadian	PR845AW#ABC	Switzerland (Italian/English)	PR845AW#ACN
L. America	PR845AW#ABM	Dutch	PR845AW#ABH
Japan (English)	PR845AW#ACF	Denmark	PR845AW#ACE
Japan (Japanese)	PR845AW#ABJ	Asia/Pacific (English)	PR845AW#AB4
UK	PR845AW#ABU	Korea	PR845AW#AB1
Germany	PR845AW#ABD	China	PR845AW#AB2
France	PR845AW#ABF	Taiwan	PR845AW#AB0
Italy	PR845AW#ABZ	India	PR845AW#ACJ
Spain	PR845AW#ABE	Australia	PR845AW#ABG
Europe	PR845AW#AK6	Thailand	PR845AW#AKL

## Standard Features - Preconfigured Global Models

xw6200X/XD3.6/C74/ H1.0/280E/dF/s	<b>Processor</b>	64-bit Intel Xeon processor 3.60 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 10,000 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

### xw6200X/XD3.6/C74/H1.0/280E/dF/s Country Code Key

N. America	PM201AW#ABA	Switzerland (German/French)	PM201AW#AR8
Fr. Canadian	PM201AW#ABC	Switzerland (Italian/English)	PM201AW#ACN
L. America	PM201AW#ABM	Dutch	PM201AW#ABH
Japan (English)	PM201AW#ACF	Denmark	PM201AW#ACE
Japan (Japanese)	PM201AW#ABJ	Asia/Pacific (English)	PM201AW#AB4
UK	PM201AW#ABU	Korea	PM201AW#AB1
Germany	PM201AW#ABD	China	PM201AW#AB2
France	PM201AW#ABF	Taiwan	PM201AW#AB0
Italy	PM201AW#ABZ	India	PM201AW#ACJ
Spain	PM201AW#ABE	Australia	PM201AW#ABG
Europe	PM201AW#AK6	Thailand	PM201AW#AKL

xw6200X/XD3.6+/B80/ H1.0/280E/dF/s	<b>Processor</b>	Dual 64-bit Intel Xeon processors 3.60 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2 per processor
	<b>Memory</b>	1 GB (2x512) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	80 GB SATA 1.5-GB/S 7200 rpm (1st)
	<b>Graphics</b>	NVIDIA Quadro NVS 280 PCI Express included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
	<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

## Standard Features - Preconfigured Global Models

### xw6200X/XD3.6+/B80/H1.0/280E/dF/s Country Code Key

N. America	PD902AW#ABA	Switzerland (German/French)	PD902AW#AR8
Fr. Canadian	PD902AW#ABC	Switzerland (Italian/English)	PD902AW#ACN
L. America	PD902AW#ABM	Dutch	PD902AW#ABH
Japan (English)	PD902AW#ACF	Denmark	PD902AW#ACE
Japan (Japanese)	PD902AW#ABJ	Asia/Pacific (English)	PD902AW#AB4
UK	PD902AW#ABU	Korea	PD902AW#AB1
Germany	PD902AW#ABD	China	PD902AW#AB2
France	PD902AW#ABF	Taiwan	PD902AW#AB0
Italy	PD902AW#ABZ	India	PD902AW#ACJ
Spain	PD902AW#ABE	Australia	PD902AW#ABG
Europe	PD902AW#AK6	Thailand	PD902AW#AKL

xw6200X/XD3.6+/C74/H2/280E+/dF/s – Trader station	<b>Processor</b>	Dual 64-bit Intel Xeon processors 3.60 GHz 1 MB/800
	<b>OS</b>	Microsoft Windows XP Professional
	<b>Cache Memory</b>	1 MB L2 per processor
	<b>Memory</b>	2 GB (2x1) DDR2-400 ECC Registered
	<b>Optical Drive</b>	16X DVD-ROM
	<b>Hard Drive</b>	74 GB SATA 1.5-GB/S 10,000 rpm (1st)
	<b>Graphics</b>	Both the NVIDIA Quadro NVS 280 PCI Express and NVIDIA Quadro NVS 280 PCI graphics cards are included in base configuration.
	<b>Mouse</b>	HP scroll mouse (PS/2)
<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard	

### xw6200X/XD3.6+/C74/H2/280E+/dF/s Country Code Key

N. America	PM202AW#ABA	Switzerland (German/French)	PM202AW#AR8
Fr. Canadian	PM202AW#ABC	Switzerland (Italian/English)	PM202AW#ACN
L. America	PM202AW#ABM	Dutch	PM202AW#ABH
Japan (English)	PM202AW#ACF	Denmark	PM202AW#ACE
Japan (Japanese)	PM202AW#ABJ	Asia/Pacific (English)	PM202AW#AB4
UK	PM202AW#ABU	Korea	PM202AW#AB1
Germany	PM202AW#ABD	China	PM202AW#AB2
France	PM202AW#ABF	Taiwan	PM202AW#AB0
Italy	PM202AW#ABZ	India	PM202AW#ACJ
Spain	PM202AW#ABE	Australia	PM202AW#ABG
Europe	PM202AW#AK6	Thailand	PM202AW#AKL

## After-Market Options

Processors	2nd 64-bit Intel Xeon™ processor with Hyper-Threading	Part Number
	64-bit Intel Xeon processor at 2.8 GHz with 800 MHz FSB & 1 MB of L2 cache	DY665A
	64-bit Intel Xeon processor at 2.8 GHz with 800 MHz FSB & 2 MB of L2 cache	EC421AA
	64-bit Intel Xeon processor at 3.0 GHz with 800 MHz FSB & 1 MB of L2 cache	DY666A
	64-bit Intel Xeon processor at 3.0 GHz with 800 MHz FSB & 2 MB of L2 cache	PQ903A
	64-bit Intel Xeon processor at 3.2 GHz with 800 MHz FSB & 1 MB of L2 cache	DY667A
	64-bit Intel Xeon processor at 3.2 GHz with 800 MHz FSB & 2 MB of L2 cache	PQ904A
	64-bit Intel Xeon processor at 3.4 GHz with 800 MHz FSB & 1 MB of L2 cache	DY668A
	64-bit Intel Xeon processor at 3.4 GHz with 800 MHz FSB & 2 MB of L2 cache	PQ905A
	64-bit Intel Xeon processor at 3.6 GHz with 800 MHz FSB & 1 MB of L2 cache	DY669A
	64-bit Intel Xeon processor at 3.6 GHz with 800 MHz FSB & 2 MB of L2 cache	PQ906A
	64-bit Intel Xeon processor at 3.8 GHz with 800 MHz FSB & 2 MB of L2 cache	PH202A

Graphics	Multi display solutions	PCI	PCI-Express	Windows XP	Red Hat Linux	Part Number
	NVIDIA Quadro NVS 280 (64 MB, VGA & DVI)	X		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA932A
	NVIDIA Quadro NVS 400 (64 MB, quad head, VGA & DVI)	X		32-Bit, 64-Bit		AA605A
	Quadro NVS 400 DVI cables	NA		32-Bit, 64-Bit		AA606A
	NVIDIA Quadro NVS 280 PCI Express (64 MB, VGA & DVI)		X	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY650A
	NVIDIA Quadro NVS 285 PCI Express (128 MB)		X	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	EE061AA
	NVIDIA DVI Dual-head Connector Cablefor NVS cards	X	X	32-Bit, 64-Bit		DL139A
	NVIDIA Quadro FX 330 (64 MB)		X	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	PB332A
	ATI FireGL V3100 (128 MB)		X	32-Bit, 64-Bit		PE949A
	NVIDIA Quadro FX 540 (128 MB)		X	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	PH791A
	NVIDIA Quadro FX 1400 (128 MB)		X	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	PM979A
	ATI FireGL V5100 (128 MB)		X	32-Bit, 64-Bit		PB330A
	NVIDIA Quadro FX 3450 PCI Express (256 MB)		X	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	PY640AA

## After-Market Options

Hard Drives	Serial ATA 3.0-Gb/s Hard Drives (Currently supported only at 1.5Gb/s. To get 3Gb/s performance, a SATA 3.0-Gb/s controller must be added)	Windows XP	Red Hat Linux	Part Number
	80 GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	32-Bit, 64-Bit	WS3, WS4	PY276AA
	160 GB SATA 3.0-Gb/s NCQ Hard Drive (7200 rpm)	32-Bit, 64-Bit	WS3, WS4	PV944A
	250 GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	32-Bit, 64-Bit	WS3, WS4	PY278AA
	500 GB SATA 3.0-Gb/s NCQ Hard Drive (7200 rpm)	32-Bit, 64-Bit	WS3, WS4	PV943A
	<b>Serial ATA 1.5-Gb/s Hard Drives</b>			
	250 GB SATA 1.5-GB/S Hard Drive (7200 rpm)	32-Bit, 64-Bit	WS3, WS4	DS702A
	400 GB SATA 1.5-GB/S Hard Drive (7200 rpm)	32-Bit, 64-Bit	WS3, WS4	PM254A
	74 GB SATA 1.5-GB/S Hard Drive (10,000 rpm)	32-Bit, 64-Bit	WS3, WS4	DX760A
	<b>SCSI Hard Drives</b>			
	73 GB Ultra320 SCSI Hard Drive (10,000 rpm)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA613A
	146 GB Ultra320 SCSI Hard Drive (10,000 rpm)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA614A
	300 GB Ultra320 SCSI Hard Drive (10,000 rpm)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY672A
	36 GB Ultra320 SCSI Hard Drive (15,000 rpm)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA616A
	73 GB Ultra320 SCSI Hard Drive (15,000 rpm)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA617A
	146 GB Ultra320 SCSI Hard Drive (15,000 rpm)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY671A
	Bracket HDD 3.5to5.25 xw6200			DY659A
	Cable, 3 port SCSI xw4200/6200			DY661A

Controllers	SCSI Controllers	PCI	PCI-Express	Windows XP	Red Hat Linux	Part Number
	Adaptec Serial ATA 3Gb/s RAID 1420SA card		X	32-Bit, 64-Bit	WS3	ED090AA
	U320 SCSI Controller RAID 0,1 & external connector	X		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DZ554A
	Ultra320 SCSI RAID Adaptec 2120S (Windows only, includes external connector)	X		32-Bit, 64-Bit		AA850A

## After-Market Options

Input Devices		Windows XP	Red Hat Linux	Part Number
<b>Keyboards</b>				
HP PS/2 Standard Keyboard (Carbonite/Silver)		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DT527A
HP USB Standard Keyboard (Carbonite/Silver)		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DT528A
HP USB Smart Card Keyboard		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	ED707AA
Smartcard adapter for modular keyboard		32-Bit, 64-Bit		DT531A
<b>Pointing Devices</b>				
HP PS/2 2-Button Scroll Mouse (Carbonite)		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DD440B
HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DC172B
HP PS/2 3-Button Mouse		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA778A
HP USB Optical 3-button mouse		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY651A
USB Spaceball 5000		32-Bit, 64-Bit		DV675A
USB SpaceMouse		32-Bit, 64-Bit		DZ203A
HP SpacePilot 3D USB Intelligent Controller		32-Bit, 64-Bit		EF390AA

Networking	NICs	PCI	PCI-Express	Windows XP	Red Hat Linux	Part Number
	Intel Pro 1000 MT PCI Gigabit NIC	X		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DC193A
	Broadcom NetXtreme Gigabit Ethernet PCI Adapter (BCM5782)	X		32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DC194A
	Broadcom NetXtreme Gigabit Ethernet PCIe Adapter		X	32-Bit, 64-Bit	WS3, WS4	EA833AA

Memory (DIMMs)	400 MHz DDR-2 PC2-3200 ECC Registered DIMMs	Windows XP	Red Hat Linux	Part Number
	256 MB DDR-2 PC2-3200 (400 MHz) ECC Registered	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY656A
	512 MB DDR-2 PC2-3200 (400 MHz) ECC Registered	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY658A
	1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY655A
	2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DY657A

## After-Market Options

### Monitors (Supported by all TFTs

Operating Systems offered by HP)	HP TFT L2335 (23-inch)	P9615W#
	HP TFT L2035 (20.1-inch)	P9614W#
	HP TFT L1955 2T Top (19.1-inch)	PH466AT
	HP TFT L1755 (17-inch)	PL777AA

### Multimedia

	PCI	PCI-Express	Part Number
Adaptec Fireconnect 2100 Firewire (1394) PCI Card (Windows only)	X		PA997A

**NOTE:** Although HP Personal Workstations can be ordered with the HP Installer Kit for Linux and an IEEE 1394 card, HP cannot provide customer support for this configuration. Please refer to the Linux Hardware Support Matrix ([http://www.hp.com/support/linux\\_hardware\\_matrix](http://www.hp.com/support/linux_hardware_matrix)) for details, and to the Linux User Manual ([http://www.hp.com/support/linux\\_user\\_manual](http://www.hp.com/support/linux_user_manual)) for tips on user-enablement of the IEEE 1394 Card.

### Audio

	Part Number
Sound Blaster Audigy 2 ZS PCI Audio Card	DV440A
SoundBlaster X-Fi XtremeMusic Audio Card	EA326AA
HP Satellite Speakers (available January 2006)	ZD929AA

### Optical Drives

	Windows XP	Red Hat Linux	Part Number
<b>DVD-ROM Drive</b> 16X/48X DVD-ROM w/ +R read	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	AA620B
<b>CD-ROM Drive</b> 48X Max CD-ROM Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DC143B
<b>CD-RW Drive</b> 48X/32X/48X CD-RW Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DE205B
<b>Combo Drive</b> 48X/32X Combo DVD-ROM/CD-RW Drive	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DE206B
<b>DVD+/-RW Drive</b> 16X DVD+/-RW, Dual-Layer LightScribe (LightScribe labeling functionality not supported on Linux)	32-Bit, 64-Bit	7.2, 7.3, WS3, WS4	DZ555B

## After-Market Options

Removable Storage	Windows XP	Red Hat Linux	Part Number
HP 256-MB Drive Key II Flash Drive	32-Bit, 64-Bit	WS3, WS4	PH657A
1.44 MB Internal Floppy Drive	32-Bit, 64-Bit	WS3	DY670A
HP DAT24i Internal DDS3 tape drive	32-Bit		C1555D
HP DAT24e External DDS3 tape drive	32-Bit		C1556D
HP DAT40i Internal DDS4 tape drive	32-Bit		C5686B
HP DAT40e External DDS4 tape drive	32-Bit		C5687C
HP DAT72i Internal DAT72 tape drive	32-Bit		Q1522A
HP DAT72e External DAT72 tape drive	32-Bit		Q1523A

The following Removable Drive Enclosure products are available from and supported by 3rd party:

StorCase Rhino Jr. SATA 1.5Gb/s Removable Disk Enclosure

(For NA, use: HP P/N A466720, for WW, use: vendor P/N S21J111)

Security	Chassis clamp lock, universal, no cable	DE817A
	Chassis clamp lock, universal, with cable	DE818A

Brackets/Standards	HP xw6200 sliding rack kit	DY663A
	<ul style="list-style-type: none"> <li>Exclusively designed for the xw6200</li> <li>Standard-width, ball bearing sliding rails</li> <li>Includes hardware to work with IT racks only (not broadcast)</li> </ul>	
	Depth Adjustable Rails (stationary)	332558-B21
	Sliding Shelf kit	234672-B21
	Fixed shelf kit	253449-B21

Other Devices	IDE Cable Kit for HP xw6200 and xw8200 (2nd)	DY660A
	Front Card Guide and Fan Kit	DY648A

Operating Systems	Red Hat Enterprise Linux Workstation 3 Update 5 (32-bit version)	EA698AA
	Red Hat Enterprise Linux Workstation 3 Update 5 (64-bit version)	EA699AA
	Red Hat Enterprise Linux Workstation 4 Update 1 (32/64-bit version)	EA700AA



## After-Market Options

Software	Windows XP	Red Hat Linux	Part Number
HP Remote Graphics V2 LTU for HP WS	32-Bit	7.2, 7.3, WS3, WS4	PE672A
HP Remote Graphics V3LTU for HP WS	32-Bit	7.2, 7.3, WS3, WS4	PY682AA
HP Remote Graphics V2 Receiver LTU	32-Bit	7.2, 7.3, WS3, WS4	PE674A
HP Remote Graphics V3 Receiver LTU	32-Bit	7.2, 7.3, WS3, WS4	PY684AA
HP Remote Graphics V2 software media	32-Bit	7.2, 7.3, WS3, WS4	PE675A
HP Remote Graphics V3 software media	32-Bit	7.2, 7.3, WS3, WS4	PY685AA
HP Remote SW for HP 1 year Update Subscription	32-Bit	7.2, 7.3, WS3, WS4	PN681A
HP Remote SW Receiver 1 year Update Subscription	32-Bit	7.2, 7.3, WS3, WS4	PN680A

## Memory

### E7525 chipset

#### DDR-2 SDRAM ECC REGISTERED MEMORY

If only using one DIMM, install it in socket 1. For more than one DIMM, install memory in pairs (a pair would be considered to be the DIMMs in sockets 1 & 2, 3 & 4) and do not mix speeds. It is always best to load the memory in pairs rather than a single DIMM (two 512 MB DIMMs will have better performance than a single 1 GB DIMM). Each pair of DIMMs must be the same size and same DRAM technology. The Intel E7525 chipset supports ECC Registered 400 MHz (PC2-3200) DDR-2 memory only.

#### MAXIMUM MEMORY

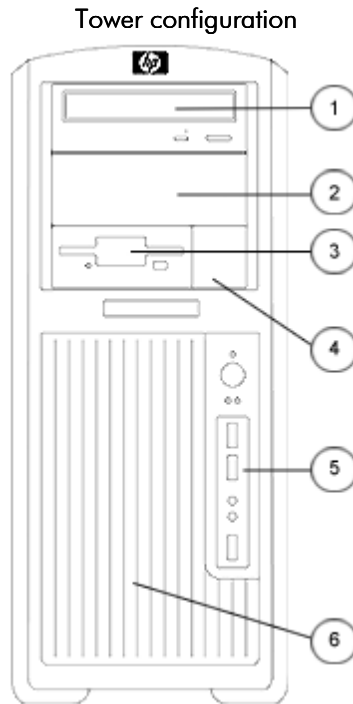
Supports up to 8 GB of DDR SDRAM

#### POSSIBLE MEMORY CONFIGURATIONS

*Not all memory configurations possible are represented below.*

DIMM Size	Slot			
	1	2	3	4
256 MB	256 MB			
512 MB	512 MB			
512 MB	256 MB	256 MB		
1 GB	1 GB			
1 GB	256 MB	256 MB	256 MB	256 MB
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
8 GB	2 GB	2 GB	2 GB	2 GB

## Storage



### Convertible Minitower

Optional Diskette Drive  
 5.25" Storage Drive Bays  
 (position 1 drive bay is limited to 198 mm depth when optional smart cover solenoid lock is installed; position 2 drive bay can be converted to an internal 3.5" 3rd hard drive bay with optional bracket)  
 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 (position 1 drive bay is limited to 198 mm depth when optional smart cover solenoid lock is installed; position 2 drive bay can be converted to an internal 3.5" 3rd hard drive bay with optional bracket)	2	1, 2	IDE
3.5" Storage Drive Bays with acoustic dampening rail assemblies	2 (3)	4, 5 (and 2, for 3rd drive using optical bay)	SATA or optional SCSI Factory Integrated RAID*

\* **NOTE:** Factory Integrated RAID 0 Configuration (Striped Array) and RAID 1 Configuration (Mirrored Array) requires 2 hard drives with identical speeds, capacity and interface.

## Additional Technical Specifications

<b>System Board</b>	
Architecture	Xeon 64-bit/PCI-E
Chipset	Intel E7525/ICH5R Chipset
Super I/O Controller	SMSC LPC47B397
System Board Form Factor	ATX (slightly larger than standard ATX)
Processor Socket	Dual 604 Pin ZIF
DIMM Connectors (DDR2, 1.8V)	4
AGP Connector (1.5V)	None
Integrated Graphics	None
PCI Connectors (5.0V)	4 full length 33 MHz 32-bit
PCI Express Connectors	1 x16 1 x8 (with x4 electricals)
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	Yes
Hood Sensor Header	Yes
Multibay Header	Yes
Hard drive acoustic dampening rails	Standard in 2 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> <li>• RAID 0 Configuration - Striped Array</li> <li>• RAID 1 Configuration - Mirrored Array</li> </ul>
Integrated Broadcom	Yes
NetXtreme Gigabit Ethernet for HP	Yes
Wake-On-Lan®	Yes
ASF 1.0 (Alert Standard Format)	Yes
Power Supply Header	Yes
Power Switch, Power LED & Hard Drive LED Header	Yes
Password Clear Header	Yes
Riser Connector	None

## Additional Technical Specifications

HDD activity LED Header	Yes, 2 & 4 pin
PCI extender that connects to System Board	None

## Technical Specifications

<b>Cooling</b>	
Cooling Solutions Supported	Yes
Power Supply Fan (Variable Speed)	92 x 25 mm
Processor Fan-Heatsink (Variable Speed)	70 x 15 mm
Chassis Fan (front)	One 92 x 25 mm (optional)
Chassis Fan (rear)	Two 92 x 25 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	9A/9A
Maximum Rated Power	500 W
Heat Dissipation	Typical 1228.9 btu/hr Maximum 1706 btu/hr
PS Size (wide x high x deep)	150 mm x 98 mm x 168 mm
Energy Star Compliant	Yes
FEMP Standby Power Compliant (<2W in S5 - Power Off)	No
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)	360 W = 1228.9 btu/hr
Windows XP Idle	201 W = 685.9 btu/hr
Hibernate mode (S4)	6.4 W = 21.84 btu/hr
Power Off (S5)	6.4 W = 21.84 btu/hr

<b>ROM Features</b>	<b>Description</b>
Instantly Available PC	Allows for very low power consumption with quick resume time

## Technical Specifications

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)	Monitors the temperature state within the chassis. Three modes: <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 Management 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> <li>Supports ACPI 2.0 for full compatibility with 64-bit operating systems</li> </ul>
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

## Technical Specifications

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

<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



## Technical Specifications

System serial number, model, & manufacturer	System serial number, model, & manufacturer stored in a non-volatile memory and can be retrieved with management SW or viewed in ROM-based F10 setup
ROM revision levels	Identifies system ROM revision levels and reports in ROM-based F10 setup Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information
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
Hard drive interface Integrity Monitoring (CRC Checking)	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: <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> <li>• Running independently of the operating system, it can be accessed through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced.</li> </ul> <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 DPS Access through F10 Setup during Boot (F10 diagnostic access not available with SCSI drives)</p>
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure SMART I – Drive Failure Prediction SMART II – Off-Line Data Collection SMART III – Off-Line Read Scanning with Defect Reallocation

<b>Security Features</b>	
Access panel key lock (standard)	Prevents removal of the access panel and all internal components including optical and floppy drives
Smart Cover solenoid lock (optional)	Prevents removal of the access panel and all internal components including optical and floppy drives. Eliminates the need for a physical key by enabling password-protected locking & unlocking by a local or remote user.
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.
Intrusion Sensor (optional)	Notifies a local or remote user when the chassis access panel has been opened.

## 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
Chassis fan removal	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
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
Diagnostic Power Switch LED on board	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

## Technical Specifications

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	Also acts as a reset switch when held for 4 seconds

<b>Service and Support</b>	On-site Warranty and Service ( <a href="#">Note 1</a> ): This three-year, limited warranty and service offering delivers three years of on-site, next business-day ( <a href="#">Note 2</a> ) service for parts and labor and includes free telephone support ( <a href="#">Note 3</a> ) 24 x 7. Global coverage ( <a href="#">Note 2</a> ) 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.
	<a href="#">NOTE 1</a> : Terms and conditions may vary by country. Certain restrictions and exclusions apply.
	<a href="#">NOTE 2</a> : 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.
	<a href="#">NOTE 3</a> : 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.

## Technical Specifications - Audio

AC97 Integrated ADI 1981B Audio	Type	Integrated
	AC '97 Stereo Codec	Yes
	FM Synthesis Support	Yes – Yamaha XG Lite
	OPL3 FM Synthesis Support	Yes
	Sound Blaster Compatibility	Yes
	Audio Jacks	Microphone-In (20-K ohm Input Impedance); rear stereo and front analog microphone ports 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	
Sound Blaster X-Fi XtremeMusic Audio Card	Audio Quality	Total Harmonic Distortion + Noise at 1kHz (20kHz Low-pass filter) = 0.004%
	Signal to Noise Ratio (SNR)	Signal-to-Noise Ratio (20kHz Low-pass filter, A-Weighted) <ul style="list-style-type: none"> <li>• Stereo Output: 109dB</li> <li>• Front and Rear Channels: 109dB</li> <li>• Center, Subwoofer and Side Channels: 109dB</li> </ul>
	Sound Conversion	24-bit Analog-to-Digital conversion of analog inputs at 96kHz sample rate 24-bit Digital-to-Analog conversion of digital sources at 96kHz to analog 7.1 speaker output 24-bit Digital-to-Analog conversion of stereo digital sources at 192kHz to stereo output
	Recording/Sampling Rate	44.1, 48 and 96kHz

## Technical Specifications - Audio

<b>ASIO 2.0 support</b>	16-bit/44.1kHz, 16-bit/48kHz, 24-bit/44.1kHz 24-bit/48kHz and 24-bit/96kHz with direct monitoring	
<b>Enhanced SoundFont support</b>	up to 24-bit resolution 24-bit/96kHz	
<b>DACs</b>	24-bit/192kHz	
<b>Voice Support</b>	128 voices	
<b>Max. Channels in 3D Positional Audio</b>	7.1	
<b>EAX® ADVANCED HD™ 5.0 support</b>	Yes including EAX® MacroFX™, EAX® PurePath™ and Environment FlexiFX™	
<b>Connectors</b>	FlexiJack (Performing a 3-in-1 function, Digital In / Line In / Microphone) via 3.50 mm minijack Line level out (Front / Rear / Center / Subwoofer / Rear Center) via 3.50 mm minijacks AUX_IN line-level analog input via 4-pin Molex connector on card One AD_Link (26 pin) connector for linking to the X-Fi I/O Console (upgrade option)	
<b>Dimensions</b>	7.25" x5" x .9" ( x x )	
<b>Additional product features</b>	<b>Movies</b>	THX Certification Dolby Digital EX 6.1 Playback DTS-ES 6.1 Playback
	<b>Music</b>	X-Fi 24-bit Crystalizer CMSS-3D SuperRip
	<b>Audio Creation</b>	Pristine audio playback quality with a near transparent SRC engine Up to eight 24 bit hardware effects ASIO recording with latency as low as one millisecond 24-bit SoundFont® sampling 3D MIDI
	<b>Gaming</b>	EAX ADVANCED HD 5.0
	<b>Software Bundle</b>	Doom 3 Sound Blaster EAX patch Entertainment Mode Audio Creation Mode Game Mode Mode Switcher Audio Console Creative MediaSource Creative MediaSource DVD-Audio Player DTS Neo:6 Settings Karaoke Player Entertainment Center Smart Recorder SoundFont Bank Manager Speaker Connection Wizard THX Setup Console Vienna SoundFont Studio Volume Panel WaveStudio

## Technical Specifications - Audio

<b>Minimum system requirements</b>	<b>System RAM</b>	Console Launcher Creative Media Toolbox Creative Diagnostics
	<b>Hard disk</b>	256MB
		600MB free space
		Available PCI 2.1 slot for the audio card
		CD-ROM/CD-RW or CD/DVD-ROM required for software installation
	<b>Operating System</b>	Microsoft® Windows® XP Service Pack 2 (SP2)

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## 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		
<hr/>			
<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	

## Technical Specifications - Communications

<b>Network transfer rate</b>	10BASE-T (half-duplex) 10 Mbps
	10BASE-T (full-duplex) 20 Mbps
	100BASE-TX (half-duplex) 100 Mbps
	100BASE-TX (full-duplex) 200 Mbps
	1000BASE-T, 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 XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux
<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 LSI 20320 Ultra320 SCSI single channel host adapter	Bus architecture	PCI-X (backward compatible with PCI)
	Number of supported devices	Up to 15 SCSI devices
	Interface protocol	64 bit, 133MHz PCI-X
	Host bus transfer rate	Up to 1MB/s
	SCSI data transfer rate	Up to 320MB/s per channel
	SCSI Bus	Wide Ultra320, Low Voltage Differential, and Ultra Wide Single-Ended
	Internal connector	68-pin HD
	External connector	68 pin
	Total connectors	2
	Plug and Play Support	No
	Dimensions (H x L)	6.6 x 2.5 in (16.9 x 6.4 cm)
	Approvals	CE, VCCI, Canada, C-Tick, FCC class B, UL 94VO
	Operating system support	Microsoft Windows XP Professional Windows XP Professional x64 Edition
	Kit contents	Controller card, driver CD, LED cables, user documentation and warranty card.

Adaptec SCSI RAID 2120S Card	Dimensions (H x D)	2.5 x 6.6 in (6.4 x 16.8 cm) Low profile card
	RAID level	0, 1, 10, 5, 50, JBOD
	Data Transfer Rate	Up to 320 MB/s
	Cache Memory	64 MB (onboard)
	Device Support	Up to 15 SCSI devices
	Bus Type	64-bit/66 MHz PCI (Also support 32-bit/33 MHz PCI)
	Internal Connectors	One 68-pin high-density
	External Connectors	One 68-pin VHDCI
	System Requirements	Intel PC or equivalent with available PCI slot
	Operating Temperature	32° to 131° F (0° to 55° C)
	Power Requirements	4 amps @ +5V
	Operating System Support	Windows 2000 Professional, Windows XP Professional, Windows XP Professional x64 Edition
	Other	Optimized disk utilization Online RAID Level Migration Online capacity expansion Immediate RAID availability (background initialization) S.M.A.R.T. support
	Kit Contents	Controller card, driver CD, LED cables, user documentation and warranty card.

## Technical Specifications - Controllers

<b>Adaptec Serial ATA 3Gb/s RAID 1420SA card</b> (model ED090AA)	<b>Dimensions (H x D)</b>	2.5 x 6.6 in (6.4 x 16.8 cm)
	<b>RAID level</b>	RAID 0, 1, 10 (available this fall), and JBOD
	<b>Data Transfer Rate</b>	Up to 3.0GB/s
	<b>Device Support</b>	Up to (4) Serial ATA 3.0 Drives
	<b>Bus Type</b>	PCI-X/133 MHz (compatible to PCI 32/64-bit)
	<b>BIOS</b>	Managed using Adaptec Storage Manager, enabling remote management, monitoring and configuration through encrypted remote communications.
	<b>48-bit LBA Support</b>	Recognizes drive capacities exceeding 137 GB each
	<b>Data Protection Features</b>	Mirrors data to second drive or drive pair for RAID 1 and RAID 10; offers hot spare support for instant rebuild of failed drive in 2-drive RAID 1
	<b>ACPI Support</b>	S1, S3, & S4
	<b>Internal Connectors</b>	4 standard 7-pin SATA connectors
	<b>External Connectors</b>	None
	<b>System Requirements</b>	PC with available PCI slot
	<b>Operating Temperature</b>	32° to 131° F (0° to 55° C)
	<b>Power Requirements</b>	0.3 amps @ +5V
	<b>Operating System Support</b>	Microsoft® DOS, Windows® XP Professional, Windows XP x64 Red Hat Enterprise Linux WS3 SLES 9.0 Novell Linux Desktop 9
	<b>Kit Contents</b>	Controller card, driver CD, 4 SATA cables, standard full-size and Low-profile brackets, user documentation and warranty card
	<b>Other</b>	RAID 0, 1 and JBOD Flash BIOS allows easy upgrades Background initialization Supports bootable arrays 48-bit LBA supports large capacity drives S.M.A.R.T. and SNMP support

## Technical Specifications - Hard Drives

Serial ATA 3.0-Gb/s Hard Drives	500 GB	<b>Capacity</b>	500,107,862,016 bytes		
		<b>Height</b>	1.0 in (2.54 cm)		
		<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)		
		<b>Interface</b>	Serial ATA (3.0 Gb/s), Native Command Queuing enabled		
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s		
		<b>Buffer</b>	16 MB		
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.3 ms	
			<b>Average</b>	20.0 ms	
			<b>Full-Stroke</b>	30 ms	
		<b>Rotational Speed</b>	7,200 rpm		
		<b>Logical Blocks</b>	976,773,168		
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)		
		250 GB	250 GB	<b>Capacity</b>	250,059,350,016 bytes
<b>Height</b>	1 in (2.54 cm)				
<b>Width</b>	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)				
<b>Interface</b>	Serial ATA (3.0 Gb/s)				
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s				
<b>Buffer</b>	8 Mbytes				
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>			1.0 ms	
	<b>Average</b>			8.5 ms	
	<b>Full-Stroke</b>			18 ms	
<b>Rotational Speed</b>	7,200 rpm				
<b>Logical Blocks</b>	488,397,168				
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)				

## Technical Specifications - Hard Drives

160 GB	<b>Capacity</b>	163,928,604,672 bytes	
	<b>Height</b>	1.0 in (2.54 cm)	
	<b>Width</b>	Media diameter: 3.5 in (8.89 cm)	
		Physical size: 4 in (10.2 cm)	
	<b>Interface</b>	Serial ATA (3.0 Gb/s)	
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
	<b>Buffer</b>	8 Mbytes	
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.9 ms
		<b>Average</b>	9.3 ms
		<b>Full-Stroke</b>	18 ms
	<b>Rotational Speed</b>	7,200 rpm	
	<b>Logical Blocks</b>	320,173,056	
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
80 GB	<b>Capacity</b>	80,026,361,856 bytes	
	<b>Height</b>	1.0 in (2.54 cm)	
	<b>Width</b>	Media diameter: 3.5 in (8.89 cm)	
		Physical size: 4 in (10.2 cm)	
	<b>Interface</b>	Serial ATA (3.0 Gb/s)	
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 3 Gb/s	
	<b>Buffer</b>	8 MB	
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2 ms
		<b>Average</b>	9.3 ms
		<b>Full-Stroke</b>	21 ms
	<b>Rotational Speed</b>	7,200 rpm	
	<b>Logical Blocks</b>	156,301,488	
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

## Technical Specifications - Hard Drives

### Serial ATA 1.5-Gb/s Hard 250 GB Drives (7200 rpm)

<b>Capacity</b>	250,059,350,016 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>	≤17 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	488,397,168	
<b>Operating Temperature</b>	41° to 131°F (5° to 55°C)	

### 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>	≤15 ms
<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)	

## Technical Specifications - Hard Drives

Serial ATA 1.5-Gb/s Hard 74 GB  
Drives (10,000 rpm)

<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)	

Ultra320 SCSI Hard 73 GB  
Drives (10,000 rpm)

<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>	10,000 rpm	
<b>Logical Blocks</b>	143,374,738	
<b>Operating Temperature</b>	40° to 130° F (5° to 55° C)	

## Technical Specifications - Hard Drives

146 GB	<b>Capacity</b>	146,815,737,856 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>	10,000 rpm		
	<b>Logical Blocks</b>	286,749,488		
	<b>Operating Temperature</b>	40° to 130° F (5° to 55° C)		
	300 GB	<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 (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>		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)	36 GB	<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)		
			73 GB	<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)				
	146 GB			<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

PS/2 OR USB '04 Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC $\pm$ 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI - RFI	Conforms to FCC rules for a Class B computing device
	Mechanical	Microsoft PC 99 - 2001	Functionally compliant
		Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 - 2001	Mechanically compliant
	Environmental	Acoustics	43-dBA maximum sound pressure level
		Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence	
	Operating system support	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 and 4	
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	
	Kit contents	Keyboard, keyboard software media, installation guide, warranty card, safety and comfort	

HP USB Smart Card Keyboard (ED707AA)	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Form factor	USB basic Smart Card keyboard
		Colors	Carbonite/Silver
		Dimensions (L x W x H)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)

## Technical Specifications - Input/Output Devices

Electrical	Weight	2 lb (0.9 kg) minimum
	Operating voltage	+ 5VDC $\pm$ 5%
	Power consumption	100-mA maximum (with four LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
Mechanical	Microsoft PC 99 - 2001	Functionally compliant
	Languages	30+ available
	Keycaps	Low-profile design
	Switch actuation	55-g nominal peak force with tactile feedback
	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
Environmental	Operating temperature	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
SMARTCARD function	Support	All ISO 7816 smart cards
	Interface	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)
	Chipset	SCM STCII
	Standard APIs supported	PC/SC, EMV2000, SET
	Power	USB Port
		Short circuit detection (protects smart card and reader)
		Power supply compliant with ISO7816 and EMV (5V, 60 mA)
		Supports 3-V and 5-V cards
	Power consumption	250-mA maximum draw (50 mA for the keyboard with three LEDs ON and 200-mA maximum startup current using a high-current, 60-mA smart card)

## Technical Specifications - Input/Output Devices

	<b>Communication</b>	<b>From card</b>	Programmable from 9,600 baud to 115,200 baud
		<b>From computer</b>	Up to 38,400 baud
	<b>Landing mechanism</b>	<b>Contact device</b>	Friction contact
		<b>Card insertions rating</b>	Up to 100,000 insertion cycles
	<b>Interface modes</b>	USB communications through USB port SCM protocol Automatic card insertion/removal detection	
	<b>Reader performance interface</b>	USB connection	
	<b>Electro-magnetic standards</b>	<b>Europe</b>	89/336/CEE guideline
		<b>USA</b>	USAFCC part 15
<b>Operating system support</b>	Microsoft® Windows® 2000, Windows XP Home, Windows XP Professional, xpe, ce.net, Linux, XP-64		
<b>Approvals</b>	CE-Mark, UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, JITC, EMV2000, USB-IF		
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, TUVGS		
<b>Kit contents</b>	Keyboard, I/O Security and Documentation CD, , warranty card		
<b>Smart card compatibility</b>	<b>HP</b>	HP ProtectTools Smart Card	
	<b>American Express</b>	Amex Blue	
	<b>Axalto (Schlumberger)</b>	Cryptoflex 8K Cryptoflex 16K Cryptoflex 32K Cryptoflex 32K e-gate Cyberflex Access 64K Cyberflex Access 32K Cyberflex 32K e-gate Cyberflex 64K Cyberflex Palmera Payflex-S Payflex 1K Payflex 2K Payflex 4K Payflex 8K Prismera US DoD CAC	
	<b>Cardlogix</b>	CLXSU004KK4 CLXSU008KK5	
	<b>Datakey</b>	Model 300 Model 330	
	<b>De La Rue</b>	VisaCash	

## Technical Specifications - Input/Output Devices

<b>Gemplus</b>	Gem Expresso GKK32K Gemclub Memo GemClub Micro GemXplore GemSafe
<b>Infineon</b>	SLE66C322P
<b>SafLink (Litronic)</b>	Forte
<b>Sharp</b>	Java Card
<b>Oberthur</b>	CosmopolIIC v4 CosmopolIIC v4.1 Cosmo ID-One GalatIIC v2.1 US DoD CAC
<b>Memory Cards</b>	
<b>Atmel</b>	AT24C01ASC AT24C02SC AT24C04SC AT24C08SC AT24C16SC AT24C32SC AT24C64SC AT24C128SC AT24C256SC AT24C512SC AT88SC153 AT88SC1608
<b>Axalto (Schlumberger)</b>	PrimeFlex Store 8K PrimeFlex Store 2K
<b>nfineon</b>	SLE4406 SLE4406E SLE4406E SE SLE4418 SLE4428 SLE4432 SLE4436E SLE4442 SLE5536
<b>ISSI</b>	IS23SC4418 IS23SC4428
<b>ST</b>	14C02
<b>Telefonkarte</b>	SLE4406 SLE4436 SLE5536
<b>XICOR</b>	X24026

## Technical Specifications - Input/Output Devices

HP PS/2 Scroll Mouse	Dimensions	3.8 x 6.3 x 11.6 cm (1.5 x 2.5 x 4.6 in)	
	Weight	4.44 oz (126 g)	
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, 6 surfaces
		Non-operating shock	80 g, 6 surfaces
		Operating vibration	2 g peak acceleration
		Non-operating vibration	4 g peak acceleration
		Drop (out-of-box)	26 in (66 cm) on carpet, 6-drop sequence
		Drop (out-of-box)	1 m on asphalt tile over concrete, 6-drop sequence
	Electrical	Operating voltage	5 VDC $\pm$ 10%
		Power consumption	15 mA
		System consumption	PS/2 mini-din connector
ESD		CE level 4, 15 kV air discharge	
EMI-RFI		Conforms to FCC rules for a Class B computing device	
Mechanical	Microsoft PC99 - 2001	Functionally compliant	
	Resolution	400 $\pm$ 20% DPI	
	Tracking speed	10 in/s maximum	
	Acceleration	100 in/s	
	Switch actuation	65 g nominal peak force	
	Switch life	1,000,000 operations (using Hasco modified tester)	
	Switch type	Low force micro-switches	
	Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s	
	Cable length	6 ft (1.8 m)	
	Microsoft PC99 - 2001	Mechanically compliant	
Scroll wheel	Width	8 mm	
	Diameter	0.99 in (25.2 mm)	
	Maximum rotation speed	30 mm/s	
	Switch type	Light force micro-switch	
	Switch life	1 million operations	
Regulatory approvals	Mechanical life	Minimum 200,000 revolutions	
	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Compatibility	Operating system support	
		Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 and 4	

## Technical Specifications - Input/Output Devices

HP 2-button Optical Scroll Mouse (USB)	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)
	System requirements	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 and 4

HP 3-Button Mouse (PS/2)	Dimensions/Weight	Height	1.42 in (3.6 cm)
		Length	4.17 in (10.7 cm)
		Width	2.87 in (7.4 cm)
		Weight	5.20 oz (150 g)
	Environmental	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating temperature	-4° to 140° F (-20° to 60° C)
	Mechanical	Operating humidity	10% to 90% (non-condensing at ambient)
		Resolution	400 20% DPI
		Tracking speed	10 in/s Maximum
		Switch life	1,000,000 operations (using Hasco modified tester)
		Switch type	Micro-switches
		Tracking mechanism life	155 miles (250 km) at average speed of 10 in/s
		Cable length	6 ft (1.8 m)
		PC98-99	Mechanically compliant

SpaceBall 5000 (USB)	Physical characteristics	Dimensions (H x W x D)	3.0 x 6.0 x 8.4 in (7.6 x 15.2 x 21.3 cm)
		Ball Diameter	2.2 in (5.6 cm)
		Weight	2.1 lb (9.94 kg)
		Features	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw) Certified for leading CAD and DCC applications
	Environmental	Operating temperature	50° to 104° F (10° to 40° C)
		Non-operating temperature	43° to 140° F (6° to 60° C)
		Operating humidity	8% to 80% (non-condensing at ambient)
	Mechanical	Non-operating humidity	5% to 80% (non-condensing at ambient)
		Buttons	12 programmable (unshifted)
		Ball Force Range	0.5 - 8.2N/1.8 - 29.5 oz
		Ball Torque Range	0.085 – 0.33 oz-in. (6.91 Nmm)
		Resolution	10 bits
	Serial Specifications	Connector	USB 1.1 or greater
		Cable Length	12.8 ft. (3.9 m)
		Data Rate	USB model – 16 msec
		Flow Control	Xon/Xoff (on PS/2 model only)
	Software Drivers Available	USB model	Microsoft Windows XP Professional
	System Requirements	Disk Space	10 MB free disk space

## Technical Specifications - Input/Output Devices

**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

<b>HP SpaceMouse Plus USB</b>	<b>Physical characteristics</b>	<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
	<b>Environmental</b>	<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)
	<b>Mechanical</b>	<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	
<b>USB Specifications</b>	<b>Connector</b>	USB 1.1 or greater	
	<b>Cable Length</b>	6.56 ft (2 m)	
	<b>Data Rate</b>	16 msec	
<b>Software Drivers Available</b>	Microsoft Windows XP Professional		
<b>System Requirements</b>	<b>Disk Space</b>	10 MB free disk space	
<b>Regulatory Approvals</b>	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		

<b>1394 FireWire PCI card</b>	<b>Device Interface Protocol</b>	IEEE-1394a	
	<b>Data Rate</b>	400 Mbps	
	<b>Devices Supported</b>	IEEE-1394 compliant devices	
	<b>Bus Interface</b>	PCI	
	<b>Physical</b>	Low profile PCI card with a full height bracket	
	<b>Environmental</b>	<b>Operating temperature</b>	41° to 95° F (5° to 35° C)
		<b>Non-operating temperature</b>	158° F (70° C) and above
		<b>Relative humidity</b>	10% to 90%
		<b>Ports</b>	2 rear and 2 front (depends on model of PC)
	<b>Minimum System Requirements</b>	Windows XP Professional, Windows XP Professional x64 Edition, Linux support with the HP Installer Kit for Linux Pentium II 266 or faster 32-MB RAM 1-GB Hard Drive CD-ROM drive Built in sound system	



## Technical Specifications - Input/Output Devices

HP SpacePilot 3D USB Intelligent Controller (model EF390AA)	Physical Characteristics	Dimensions (L x W x H)	9.3 x 5.6 x 2.0 in (236 x 143 x 53 mm)
		Weight	1.875 lb (0.85 kg)
	Mechanical	Palmrest	Sculpted
		Buttons	21+ programmable speed keys 15 reprogrammable
		LCD Viewing Area	(W x H) 4.1 x 1.2 in (102 x 30 mm)
		Active Area	(W x H) 3.9 x 1.0 in (98 x 26 mm)
		Display Format	240 x 64
		Motion Controller	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw)
	System Requirements	Device Sensitivity	Adjustable to preference
		Intel Pentium 4 or AMD Athlon processor based system	
20 megabytes free disk space for driver and plug-in installation (CD-ROM device required)			
Operating System Supported	USB 1.1 or 2.0		
	Microsoft Windows 2000 and XP		
Regulatory Approvals	FCC, CE		

## Technical Specifications - Optical Devices

<b>48X CD-ROM Drive</b>	<b>Form Factor</b>	5.25-in, half-height, tray load	
	<b>Mounting Orientation</b>	Horizontal or vertical	
	<b>Interface</b>	ATAPI/EIDE	
	<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>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>CD Media</b>	stamped, CD-R, CD-RW (LS, HS, US)
		<b>CD Capacities</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, 80-minute)
		<b>CD Formats</b>	CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD
		<b>Access Times (typical reads, including settling)</b>	<b>CD-ROM Mode 1</b> < 125 ms <b>Full Stroke CD</b> < 210 ms <b>Start-up Time (typical)</b> < 7 s (single session), < 30 s (multi-session) <b>Stop Time (typical)</b> < 4 s <b>Write Buffer Size</b> 128 KB (minimum) <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>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
		<b>DC Power Requirement</b>	5 VDC ± 5% - 100 mV ripple p-p
			12 VDC ± 5% - 200 mV ripple p-p
		<b>DC Current</b>	5 VDC - < 1000 mA typical, < 1600 mA maximum
	12 VDC - < 600 mA typical, < 1400 mA maximum		
	<b>Audio Output</b>	<b>Total Drive Power (standby mode)</b>	< 2.5 Watt
		<b>Line-Out</b>	0.7 VRMS
		<b>Signal-to-Noise Ratio</b>	74 dB
	<b>Configuration Jumper Block</b>	<b>Channel Separation</b>	65 dB
		Master, slave, and cable select modes	
<b>Operating Conditions (all conditions non-condensing)</b>		<b>Temperature</b> 41° to 122° F (5° to 50° C) <b>Humidity</b> 10% to 80%	
<b>Certifications, Approvals</b>	MMC-3 support, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, 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 (FCC Class B)		

## Technical Specifications - Optical Devices

<b>Operating Systems Supported</b>	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3
<b>Supplied Software</b>	None

<b>16X/48X DVD-ROM Drive Height with +R Read Support</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>	<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)
<b>Access Times</b> (typical reads, including settling)	<b>DVD-ROM Single Layer</b>	120 ms
	<b>CD-ROM Mode 1</b>	90 ms
	<b>Full Stroke DVD</b>	240 ms (seek)
	<b>Full Stroke CD</b>	160 ms (seek)
	<b>Startup Time</b>	< 10 seconds (typical)
	<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>	<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
<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC Power Requirement</b>	5 VDC $\pm$ 5% – 100 mV ripple p-p 12 VDC $\pm$ 5% – 200 mV ripple p-p
	<b>DC Current</b>	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical, <1800 mA maximum
<b>Audio Output</b>	<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	

## Technical Specifications - Optical Devices

<b>Operating Environmental</b> (all conditions non-condensing)	<b>Temperature</b> (operating)	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b> (operating)	10% to 85%
	<b>Maximum Wet Bulb Temperature</b> (operating)	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>	Windows 2000, XP Professional, and XP Professional x64 Edition Red Hat Linux 7.2, 7.3 WS3 and WS4 Versions	
<b>Kit Contents</b>	16X/40X DVD-ROM Drive, InterVideo WinDVD MPEG Movie Playback software, audio cable, and installation guide.	

### HP 48X CD-RW

<b>Form Factor</b>	5.25-inch, half-height, tray-load	
<b>Mounting Orientation</b>	Horizontal or vertical	
<b>Interface</b>	ATAPI/EIDE	
<b>Dimensions</b> (HxWxD)	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</b> (max)	2.0 lb (0.9 kg)	
<b>Read Only Disc Parameters</b>	<b>Data Transfer Rates - Read</b>	<b>Digital audio extraction</b> (minimum) - 1,800 KB/s (12X) <b>CD read</b> - up to 7,200 KB/s (48X)
	<b>Media and Formats - Read</b>	<b>CD Media:</b> stamped; CD-R; CD-RW (LS, HS, US) <b>CD Capacities:</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, 80-minute) <b>CD Formats:</b> CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD

## Technical Specifications - Optical Devices

Writeable Disc Parameters	Data Transfer Rates - Write	CD-R write - 2100 KB/s (14X) to 7200 KB/s (48X) 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)
	Media and Formats - Write	CD Media: CD-R; CD-RW (LS, HS, US) CD Capacities: 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) CD Formats: CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD
	Write Methods	Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multi-session
	Access Times (typical reads, including settling)	CD-ROM Mode 1 < 125 ms Full Stroke CD < 210 ms Start-up Time (typical) < 7 s (single session), < 30 s (multi-session) Stop Time (typical) < 4 s Write Buffer Size 2 MB Data Transfer Modes PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 2 (33.3 MB/s)
Power	Source	Four-pin, DC power receptacle
	DC Power Requirement	5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 5%-200 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum) 12 VDC (< 600 mA typical, < 1400 mA maximum)
	Total Drive Power (standby mode)	< 2.5 Watt
Audio Output	Line-Out	0.7 VRMS
	Signal-to-Noise Ratio	74 dB
	Channel Separation	65 dB
Configuration Jumper Block	Master, slave, and cable select modes	
Operating Conditions	Temperature	41° to 122° F (5° to 50° C)
	Humidity	10% to 90% 10% to 90%

## Technical Specifications - Optical Devices

<b>Certifications, Approvals</b>	MMC-3 support, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, 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 (FCC Class B)
<b>Operating Systems Supported</b>	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3
<b>Supplied Software</b> (for Windows XP)	Roxio Digital Media Plus: 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.

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

<b>Form Factor</b>	5.25-inch, half-height, tray-load
<b>Mounting Orientation</b>	Horizontal or vertical
<b>Interface</b>	ATAPI/EIDE
<b>Dimensions</b> (HxWxD)	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</b> (max)	2.6 lb (1.2 kg)
<b>Read Only Disc Parameters</b>	<p><b>Data Transfer Rates - Read</b></p> <p>CD read - 7200 KB/s (48X) Max Digital audio extraction (minimum) - 1,800 KB/s (12X)</p> <p>DVD ROM read - 21,632 KB/s (16X) Max</p> <p><b>Media and Formats - Read</b></p> <p>CD Media: stamped; CD-R; CD-RW (LS, HS, US) CD Capacities: 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) CD Formats: CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD DVD Media: stamped (single and double layer); DVD+R; DVD+RW; DVD+R DL; DVD-R; DVD-RW DVD Capacities: 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) DVD Formats: DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border ; DVD+R version 1.2 (including multi-session); DVD+R DL version 1.0; DVD+RW version 1.2</p>

## Technical Specifications - Optical Devices

Writeable Disc Parameters	Data Transfer Rates - Write	<p>CD-R write - 2100 KB/s (14X) to 7200 KB/s (48X)</p> <p>CD-RW write - 600 KB/s (4X)</p> <p>CD-RW write (high speed) - 1500 KB/s (10X) to 1800 KB/s (12X)</p> <p>CD-RW write (ultra high speed) - 2400 KB/s (16X) to 4800 KB/s (32X)</p>
	Media and Formats - Write	<p>CD Media: CD-R; CD-RW (LS, HS, US)</p> <p>CD Capacities: 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute)</p> <p>CD Formats: CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD</p>
	Write Methods	Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multi-session
Access Times (typical reads, including settling)	Random DVD	< 140 ms
	Random CD	< 125 ms, (typical)
	Full Stroke DVD	< 250 ms
	Full Stroke CD	< 210 ms
	Startup Time (single)	< 7 seconds (typical)
	Startup Time (multi-session)	< 30 seconds (typical)
	Stop Time (typical)	< 4 s
	Cache Buffer	2 MB (minimum)
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44 Mbytes/s)
	Power	Source
DC Power Requirement		5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 5%-200 mV ripple p-p
DC Current		5 VDC (< 1000 mA typical, < 1600 mA maximum)
		12 VDC (< 600 mA typical, < 1400 mA maximum)
Audio Output	Total Drive Power (standby mode)	< 2.5 Watt
	Line-Out	0.7 VRMS
	Signal-to-Noise Ratio	74 dB
Configuration Jumper Block	Channel Separation	65 dB
	Master, slave, and cable select modes	
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	

## Technical Specifications - Optical Devices

<b>Operating Conditions</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, Approvals</b>	MMC-3 support, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, 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 (FCC Class B)	
<b>Operating Systems Supported</b>	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat WS3 and WS4 Versions	
<b>Supplied Software</b> (for Windows XP)	Roxio Cineplayer Movie Playback Roxio Digital Media Plus: 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>16X DVD+/-RW, Dual-Layer</b> (Win and RHWS3)	<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</b> (W x H x D)	5.9 x 1.7 x 7.9 in (15.0 x 4.4 x 20.0 cm)	
	<b>Weight</b> (maximum)	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</b> (maximum)	<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>Read Speed</b> (maximum)	<b>CD-R</b>	16-40X CAV (2400-6000 KB/s)
<b>CD-RW (US)</b>		4-24X CLV (600-3600 KB/s)	
<b>DVD-ROM</b>		5-16X CAV (6750 - 21,600 KB/s)	
<b>Access Time</b> (typical reads, including settling)	<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)	
	<b>Random DVD</b>	< 130 ms (typical)	
	<b>Random CD</b>	< 120 ms, (typical)	
	<b>Full Stroke DVD</b>	< 240 ms (seek)	



### Technical Specifications - Optical Devices

	<b>Full Stroke CD</b>	< 200 ms (seek)
	<b>Startup Time (single)</b>	< 7 seconds (typical)
	<b>Startup Time (multi-session)</b>	< 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>	Four-pin, DC power receptacle
	<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 (standby mode)</b>	< 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 (all conditions non-condensing)</b>	<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 2000, XP Professional, and XP Professional x64 Edition Red Hat Linux 7.2, 7.3 WS3 and WS4 Versions (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 - Optical Devices

<p>16X DVD+/-RW, Dual-Layer, with LightScribe Direct Disc Labeling</p>	<p><b>Form Factor</b></p> <p><b>Orientation</b></p> <p><b>Interface</b></p> <p><b>Dimensions (HxWxD)</b></p> <p><b>Weight (maximum)</b></p> <p><b>Read Only Disc Parameters</b></p>	<p>5.25-inch, half-height, tray-load</p> <p>Horizontal or vertical</p> <p>ATAPI/EIDE</p> <p>5.9 x 1.7 x 7.9 in (15.0 x 4.4 x 20.0 cm)</p> <p>2.6 lb (1.2 kg)</p>	<p><b>Data Transfer Rates - Read</b></p> <p><b>DVD-ROM, DVD-video read</b> - 5-16X (6750 - 21,600 KB/s CAV)</p> <p><b>DVD-video playback, DVD+R, DVD+RW, DVD-R, DVD-RW</b> - 4-8X (5400 - 10,800 KB/s CAV)</p> <p><b>CD-audio playback</b> - 8x (1200 KB/s CLV)</p> <p><b>Digital audio extraction (minimum)</b> - 12X (1,800 KB/s CAV)</p> <p><b>CD-ROM, CD-R, CD-RW, CD-Audio read</b> - 16-40X (2400 to 6000 KB/s CAV)</p> <p><b>Media and Formats - Read</b></p> <p><b>CD Media:</b> stamped; CD-R; CD-RW (supports AM2) (LS, HS, US)</p> <p><b>CD Capacities:</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, 80-minute)</p> <p><b>CD Formats:</b> CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD, UDF (1.02 and 1.50)</p> <p><b>DVD Media:</b> stamped (single and double layer); DVD+R; DVD+RW; DVD+R DL; DVD-R; DVD-RW</p> <p><b>DVD Capacities:</b> 4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 14.1 GB (DVD-14), 17.0 GB (DVD-18), 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), 1.46 GB (DVD+R, 8cm), 1.46 GB (DVD+RW, 8cm)</p> <p><b>DVD Formats:</b> DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0 (including multi-border); DVD-RW version 1.0 and 1.1; DVD+R version 1.3 (including multi-session); DVD+R DL version 1.0; DVD+RW version 1.2</p>
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## Technical Specifications - Optical Devices

Writeable Disc Parameters	Data Transfer Rates - Write	<p>CD-R write - 16-40X (2400-6000 KB/s CAV)          CD-RW write - 4X (600 KB/s CLV)          CD-RW write (high speed) - 10X (1500 KB/s CLV)          CD-RW write (ultra high speed) - 16-24X (2400-3600 KB/s ZCLV)          DVD+R - 6-16X (8100-21,600 KB/s CAV), 8x (10,800 KB/s ZCLV), 2.4-4x (3250-5400 KB/s CLV)          DVD+R DL - 2.4 (3250 KB/s CLV)          DVD+RW - 2.4-4X (3250-5400 KB/s CLV)          DVD-R - 2-4X (2700-5400 KB/s CLV), 8X (10,800 KB/s ZCLV)          DVD-RW - 2-4X (2700-5400 KB/s CLV)</p>
	Media and Formats - Write	<p>CD Media: CD-R (OBII Vol2.0 Rev 1.2), CD-RW (LS, HS, US)          CD Capacities: 180 MB (mode 1, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute)          CD Formats: CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD, UDF (1.02 and 1.50)          DVD Media: DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-RW          DVD Capacities: 4.7 GB (DVD-5), 8.54 GB (DVD-9), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.1), 4.7 GB (DVD+RW version 1.3), 4.7G (DVD+R version 1.2) ), 1.46 GB (DVD+R, 8cm), 1.46 GB (DVD+RW, 8cm)          DVD Formats: DVD-R version 1.0 and 2.0 (including multi-border); DVD-RW version 1.0 and 1.1; DVD+R version 1.3 (including multi-session); DVD+R DL version 1.0; DVD+RW version 1.2</p>
	Write Methods	<p>Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multi-session</p>
LightScribe Direct Disc Labeling Parameters	Media Supported	<p>CD-R: LightScribe Version 1.0          DVD+R: LightScribe Version 1.0</p>
	Resolution	<p>Dots per inch: 600          Tracks per inch: 500-1600 (mode dependent)</p>
	Labeling Times	<p>Draft quality: &lt; 20 min          Normal quality: &lt; 28 min          Best quality: &lt; 36 min</p>

## Technical Specifications - Optical Devices

<b>Access Times</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
	<b>Full Stroke CD</b>	< 200 ms
	<b>Startup Time (single)</b>	< 7 seconds (typical)
	<b>Startup Time (multi-session)</b>	< 30 seconds (typical)
	<b>Stop Time (typical)</b>	< 4 s
	<b>Cache Buffer</b>	2 MB
	<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 series workstations)
	<b>Power</b>	<b>Source</b>
<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 (standby mode)</b>		< 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 Conditions</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, Approvals</b>	MMC-4 compliant, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, 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 (FCC Class B), relevant parts of IEC 61000-4.	
<b>Operating Systems Supported</b>	Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition Red Hat Linux 7.3 WS3 and WS4 Versions (LightScribe labeling functionality not supported on Linux)	

## Technical Specifications - Optical Devices

### Supplied Software (for Windows XP)

Roxio Cineplayer Movie Playback

Roxio Digital Media Plus: Create or copy CDs and DVDs, including music and data CDs, and data DVDs

Roxio MyDVD for DVD authoring

Dantz Retrospect Express: Back up systems to CD, DVD, or tape media

**NOTE:** LightScribe Direct Disc Labeling is supported only on 32-bit Windows XP in the launch timeframe for the xw4300. Support for Windows XP

Professional x64 Edition is anticipated to be available some time after the launch, and will require software updates. There is no support for LightScribe

labeling under Linux. The drive will operate as a DVD writer under these other operating systems, but will not be available in software applications as

a LightScribe "printer".

**NOTE:** 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 8, 9.0 distributions only include 'cdrecord'. Therefore DVD burning is only supported on WS 3.

## Technical Specifications - Graphics

<b>NVIDIA Quadro NVS 280 (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> .

## 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> .

## Technical Specifications - Graphics

<p>NVIDIA Quadro NVS 285 Form Factor PCIe Graphics with TC Technology</p>	<p><b>Graphics Controller</b> <b>Bus Type</b> <b>Memory</b></p>	<p>Nvidia Quadro NVS 285 128MB PCIe Dual Head Low profile, both ATX and low profile brackets included Integrated Quadro 285 2D graphics processor unit (GPU) PCI-Express 128 MB DDR (64 MB local frame buffer plus 64 MB of shared system memory via TurboCache technology)</p>
	<p><b>Connectors</b> <b>Dimensions</b> <b>Overlay planes</b> <b>Multi-monitor support</b> <b>Maximum pixel clock</b> <b>RAMDAC</b> <b>High-definition Video Processor (HDVP)</b></p>	<p><b>NOTE:</b> The graphics card uses part of the total system memory (RAM) for graphics performance. System memory dedicated to graphics performance is not available for other use by other programs.</p> <p>DMS-59 to dual-DVI Y-cable or dual-VGA Y-cable Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm) One 16-bit Video overlay plane Dual analog or digital monitors 350 MHz Dual 350 MHz (integrated) 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</p>
	<p><b>Available graphics drivers</b></p>	<p>Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode) HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://www.hp.com/country/us/en/support.html?pageDisplay=drivers">http://www.hp.com/country/us/en/support.html?pageDisplay=drivers</a></p>

<p>NVIDIA Quadro4 NVS 400 Graphics Card</p>	<p><b>Form Factor</b> <b>Graphics Controller</b> <b>Bus Type</b> <b>RAMDAC</b> <b>Memory</b></p>	<p>ATX Integrated Quadro4 2D/3D 128-bit graphics processor unit (GPU) PCI Dual 350 MHz</p>
	<p><b>Connectors</b> <b>Dimensions</b> <b>Multi-monitor support</b></p>	<p>64 MB 220 MHz, 4mx 32 DDR per GPU, 32-MB per GPU unified frame buffer Dual LFH-60 Low-profile form factor 1 to 4 displays with nView – with two cards (1 PCI per card), up to 8 monitors can be driven</p>
	<p><b>nView Hardware Architecture</b></p>	<p>32-bit color 2048x1536 @ 75Hz maximum resolution Dual 350 MHz RAMDACs Integrated TMDS Digital Vibrance Control (DVC) High-performance 2D rendering engine Optimized for 32-, 24-, 16-, 15- and 8-bpp modes</p>



## Technical Specifications - Graphics

<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>Supported graphics APIs</b>	Fully compliant with OpenGL 1.3 and DirectX 8.1
<b>Available graphics drivers</b>	Microsoft Windows XP and Microsoft Windows 2000, Linux See: <a href="http://www.hp.com/support/workstation_drivers/">http://www.hp.com/support/workstation_drivers/</a>

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<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	

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## Technical Specifications - Graphics

<b>ATI FireGL V3100 Graphics Card (PCI Express)</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>	Windows XP Professional, Windows XP Professional x64 Edition, Linux Xfree86HP 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>	Integrated analog display controller supporting a single analog display 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 display up to 2048x1536 @ 75Hz each

## Technical Specifications - Graphics

NVIDIA Quadro FX 1400	Form Factor	ATX, 4.376" x 8.5"
PCI-Express Graphics Controller		Single slot
	Graphics Controller	NVIDIA NV41GL
	Bus Type	PCI-Express x16, <75W power consumption
	RAMDAC	Dual 400 MHz integrated
	Memory	128 MB 300 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage 19.2 GB/s graphics memory bandwidth
	Connectors	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	Multi-monitor support	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays.
	Additional product features	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)
	Shading architecture	Fully programmable GPU (OpenGL1.5/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
	Supported graphics APIs	OpenGL 1.5 ICD with immediate mode support for all OGL primitive types DirectX 9.0c
	Available graphics drivers	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> .
	Maximum Resolution	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>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
	<b>Shading architecture</b>	Dual Link DVI enabling driving digital displays up to 3840x2400 (24Hz) 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

<b>NVIDIA Quadro FX 3450 Graphics Controller</b>	<b>Form Factor</b>	ATX
	<b>Graphics Controller</b>	NVIDIA Quadro FX 3450 Workstation GPU
	<b>Bus Type</b>	PCI-Express x16
	<b>Memory</b>	256 MB 450 MHz GDDR3 SDRAM unified graphics memory
	<b>Connectors</b>	2 DVI-I (one dual-link/one single-link) analog/digital monitor outputs, 1 3-pin Mini DIN stereo output, DVI-I to VGA adapters included

## Technical Specifications - Graphics

<b>Multi-Monitor Support</b>	Dual integrated display controllers supporting up to two analog displays at 2048 x 1536 @ 75 Hz on both displays or dual digital displays at 1920 x 1200 (single-link) and 3840 x 2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows
<b>Architecture Features</b>	256-bit memory interface 128-bit IEEE floating-point color precision 12-bit sub-pixel precision 65,536 fragment instruction 65,536 vertex instruction 3D volumetric textures Single-system powerwall 12 pixels per clock rendering engine Hardware accelerated antialiased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes 3rd generation occlusion culling 16 textures per pixel in fragment programs Window ID clipping functionality Hardware accelerated line stippling OpenGL Quad-buffered stereo
<b>Shading Architecture</b>	Fully programmable GPU (OpenGL 2.0/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
<b>High Level Shader Languages</b>	Optimized compiler for Cg and Microsoft® HLSL OpenGL 2.0 and DirectX 9.0c support Open source compiler
<b>High-Resolution Antialiasing</b>	12-bit subpixel sampling precision enhances AA quality Rotated-grid full-scene antialiasing (RG FSAA) 8x FSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920x1200
<b>Display Resolution Support</b>	Dual Link DVI-I output-drives digital displays at resolutions up to 3840 x 2400 @ 24 Hz Single Link DVI-I output drives digital displays at resolutions up to 1920 x 1200 @ 75 Hz Internal 400 MHz DACs - Two analog displays up to 2048 x 1536 @ 75 Hz each
<b>nView Architecture</b>	Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows.
<b>Supported Graphics APIs</b>	OpenGL 2.0 ICD with immediate mode support for all OGL primitive types DirectX 9.0c
<b>Available Graphics Drivers</b>	Microsoft Windows XP, Linux - Full Open GL implementation, complete with NVIDIA and ARB extensions. 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> .

## Technical Specifications - Graphics

ATI FireGL V5100 PCI-Express Graphics Controller	<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 - Monitors

<b>HP L1755 Flat Panel Monitor</b>	<b>Panel</b>	<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
		<b>Video/Other Inputs</b>	<b>Plug and Play</b>
	<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>Signal Interface/ Performance</b>	<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>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



### Technical Specifications - Monitors

	Anti-Static	Yes	
	AssetControl	Yes (accessible on HP Compaq Business Desktops featuring Intelligent Manageability)	
	Default Color Temperature	Yes (6500k, 9300k, SRGB, Custom User)	
On Screen Display (OSD) Controls	Buttons or Switches	Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch	
	Languages	English, Spanish, French, German, Italian, Japanese, Simplified Chinese	
	User Controls	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	
	Power		
	Power Supply	Auto-ranging, 90 to 265 VAC; internal power supply	
	Input Power	100 ~ 240 VAC	
	Nominal Current	1.5 A maximum	
	Frequency	50 ~ 60 Hz	
	Average	33 watts when displaying standard office software	
	Typical Power Consumption	< 40 watts	
	Maximum	< 60 watts	
	Power Saving Off Mode	< 2 W 0 watts (when master power switch is in the off position)	
	Power Cable Length	70 in (1.8 m); non-captive	
Mechanical	Dimensions (H x W x D)	<b>Unpacked with stand</b>	16.1 (minimum) to 21.2 (maximum) x 14.4 x 8.3 in (40.9 (minimum) to 42.2 (maximum) x 36.5 x 21.1 cm)
		<b>Base Area</b> (Footprint D x W)	8.3 x 12.2 in (21.1 x 30.9 cm)
		<b>Panel only</b> (without stand) (H x W x D)	11.8 x 14.4 x 2.9 in (30.1 x 40.9 x 7.3 cm)
	Weight	<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)
	Bezel Width		13 mm left and right, 14 mm top, and 15 mm bottom
	Tilt Range		-5° to +35°
	Swivel Range		± 50° horizontal swivel
	Height Adjustable		Yes (5.1 in/13 cm adjustment range)

## Technical Specifications - Monitors

	<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)
	<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 separately. For more information, refer to the HP Flat Panel Speaker Bar QuickSpec document.
	<b>HP Compaq 7000 Series Ultra-slim Desktop Integrated Work Center Stand – Part number: DL641B</b>	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
<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.

## Technical Specifications - Monitors

	<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.

<b>HP L1955 Flat Panel Monitor</b>	<b>Panel</b>	<b>Type</b>	Active matrix, thin film transistor (TFT)
		<b>Viewable Image Area</b>	19 in (48.25 cm) maximum viewable (diagonal)
		<b>Screen Opening (WxH)</b>	14.9 x 12.0 in (38.0 x 30.5 cm)
		<b>Viewing Angle (typical)</b>	176 degrees horizontal/176 degrees vertical (10:1 minimum contrast ratio)
		<b>Brightness (typical)</b>	Up to 250 nits (cd/m <sup>2</sup> )
		<b>Contrast Ratio (typical)</b>	Up to 1000:1 (typical)
		<b>Response Rate (typical)</b>	<16 ms (typical rise + fall)
		<b>Pixel Pitch</b>	0.294 mm
		<b>Color Depth Support</b>	16.7 million colors

## Technical Specifications - Monitors

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 $\pm$ 2%	
	<b>Sync Input</b>	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green (activated through on-screen display)	
	Signal Interface/ Performance	<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>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 (Analog)</b>	1280 x 1024 @ 75 Hz analog
		<b>Maximum Resolution (Digital)</b>	1280 x 1024 @ 75 Hz digital
		<b>Preset VESA Graphic Modes (non-interlaced)</b>	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	
On Screen Display (OSD) Controls		<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>Buttons or Switches</b>	Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch	
	<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 Off Mode</b>	< 2 watts	
		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 (H x W x D)</b>	<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 (Footprint D x W)</b>	8.3 x 12.2 in (21.1 x 30.9 cm)
		<b>Panel only (without stand) (H x W x D)</b>	13.2 x 15.9 x 3.1 in (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	

## Technical Specifications - Monitors

<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)
	<b>Altitude – Non-operating</b>	0 to 40,000 ft (0 to 12,192 m)
<b>Options</b>	<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>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>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
	<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>VESA External Mounting</b>	Yes (standard 4 hole pattern, 100 mm)
	<b>Kensington Lock-ready</b>	Yes

### Technical Specifications - Monitors

<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 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 L1955 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.

<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> )
		<b>Contrast Ratio</b> (typical)*	Up to 400:1
		<b>Response Rate</b> (typical)*	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

## Technical Specifications - Monitors

Signal Interface/ Performance	Horizontal Frequency	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)	
	Vertical Frequency	48 to 85 Hz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)	
	Graphics Controller	Pixelworks PW171	
	Native Resolution	1600 x 1200 @ 60 Hz (recommended)	
	Preset VESA Graphic Modes (non-interlaced)	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	
		Text Mode	720 x 400 @ 70 Hz
		Mac Mode	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
		Sun Mode	1152 x 900 @ 66 Hz
	Maximum Pixel Clock Speed	202 MHz (VGA input); 162 MHz (DVI input)	
	User Programmable Modes	Yes, 10	
	Anti-Glare	Yes	
	Anti-Static	Yes	
	Default Color Temperature	6500 K	
	Video Input	Plug and Play	Yes
Input Signal		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	
Input Impedance		75 ohms $\pm$ 10%	
Sync Input		Separate sync (HSYNC/VSYNC); composite sync, Sync on Green	
Video Cable		VGA to VGA; VGA to DVI-I; DVI-D to DVI-I	
Power	Video Cable Length	5.9 ft (1.8 m)	
	Input Power	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz	
	Frequency	47.5 to 63 Hz	
	Maximum	< 75 W	
	Power Saving	< 5 W	
	Power Cable Length	5.9 ft (1.8 m)	



## Technical Specifications - Monitors

Mechanical	Dimensions (H x W x D)	Unpacked with stand	17.36 to 20.9 x 17.8 x 8.27 in (44.1 to 53.1 x 45.2 x 21.0 cm)
		Unpacked without stand (head only)	14.29 x 17.8 x 3.19 in (36.3 x 45.2 x 8.1 cm)
		Packaged	11.5 x 21.9 x 23.9 in (29.2 x 55.6 x 60.6 cm)
	Weight	Unpacked	With stand: 20.28 lb (9.2 kg); Without stand: 12.35 lb (5.6 kg)
			Packaged
		Tilt Range	-5° to + 25° vertical
		Swivel Range	-35° to + 35°
	Environmental	Height Adjustable	Yes, range 3.54 in (9.0 cm)
		Pivot Rotation	Yes
		Base	Attached
Temperature – Operating		46° to 95° F (10° to 35° C)	
Temperature – Non-operating		6° to 140° F (-10° to 60° C)	
Humidity – Operating		20% to 80% non-condensing	
Humidity – Non-operating		5% to 85%	
Altitude – Operating		+ 12,000 ft (+3,657.6 m)	
Altitude – Non-operating	+ 40,000 ft (+12,192 m)		
Options	HP Desktop Access Center	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>Compatibility</b>		Compatible with platforms using the VESA standard video modes and HP Compaq Business Desktops d500, d300, and d200 Series, Compaq Evo Desktops, and HP Workstations
<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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<b>HP Flat Panel Monitor L2335</b>	<b>Panel</b>	<b>Type</b>	23-inch Active Matrix TFT (thin film transistor)
		<b>Viewable Image Area</b>	23 in (58.4 cm) (diagonal)
		<b>Screen Opening</b>	19.53 x 12.24 in (49.6 x 31.1 cm) (W x H)
		<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

## Technical Specifications - Monitors

	<b>Response Rate (typical)*</b>	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.		
<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 and DVI input)	
	<b>Graphics Controller</b>	Pixelworks PW172	
	<b>Native Resolution</b>	1920 x 1200 @ 60 Hz (recommended)	
	<b>Preset VESA Graphic Modes (non-interlaced)</b>		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		
<b>Video Input</b>	<b>Plug and Play Input Signal</b>	Yes	
		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	

## Technical Specifications - Monitors

	<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
	<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
	<b>Frequency</b>	47.5 to 63 Hz
	<b>Maximum</b>	< 100 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>	<p><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)</p> <p><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)</p> <p><b>Packaged</b> 11.5 x 25.75 x 23.86 in (29.2 x 65.4 x 60.6 cm)</p>
	<b>Weight</b>	<p><b>Unpacked</b> 22.27 lb (10.1 kg)</p> <p><b>Packaged</b> 30.87 lb (14.0 kg)</p>
	<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>Base</b>	Attached
<b>Environmental</b>	<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>Compatibility</b>		Compatible with platforms using the VESA standard video modes and HP Compaq Business Desktops d500, d300, and d200 Series, Compaq Evo Desktops, and HP Business Desktops d300 series.
<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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