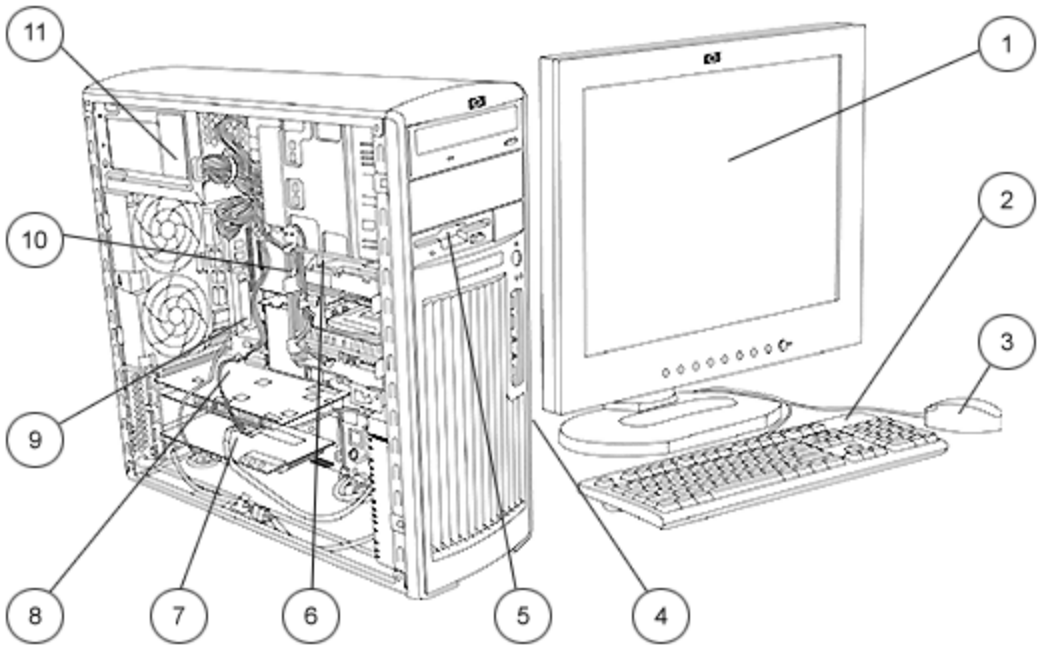
Overview



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 Intel® Xeon™ processors
11. 500 watt power supply

At A Glance

- Choice of operating systems:
  Microsoft Windows XP Professional
  Red Hat Enterprise Linux Workstation 3
  HP Linux Installer Kit (see http://www.hp.com/workstations/software/linux/ for details)
- Intel® Xeon™ processors with EM64T technology
- 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.

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Standard Features - Custom Components

Processor and Speed – One of the following	**Intel Xeon Processor** with 800 MHz Front Side Bus, 1 MB L2 cache 2.8 GHz 3.0 GHz – available in Fall 2004 3.2 GHz 3.4 GHz 3.6 GHz **2nd Intel Xeon Processor** with 800 MHz Front Side Bus, 1 MB L2 cache 2.8 GHz 3.0 GHz – available in Fall 2004 3.2 GHz 3.4 GHz 3.6 GHz
Operating System – One of the following	Microsoft Windows XP Professional Red Hat Enterprise Linux Workstation 3 32-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)
1st Hard Disk Drive – One of the following	40 GB 7200 rpm Serial ATA drive (2 MB cache) 80 GB 7200 rpm Serial ATA drive (8 MB cache) 160 GB 7200 rpm Serial ATA drive (8 MB cache) 250 GB 7200 rpm Serial ATA drive (8 MB cache) 400 GB 7200 rpm Serial ATA drive (8 MB cache) – available in Winter 2004 36 GB 10K rpm Serial ATA drive (8 MB cache) 74 GB 10K rpm Serial ATA drive (8 MB cache) 73 GB 10K Ultra320 SCSI drive 300 GB 10K Ultra320 SCSI drive 36 GB 15K Ultra320 SCSI drive 73 GB 15K Ultra320 SCSI drive 146 GB 15K Ultra320 SCSI drive
2nd Hard Disk Drive – One of the following	2nd hard drive, 40 GB 7200 rpm Serial ATA drive (2 MB cache) 2nd hard drive, 80 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 160 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 250 GB 7200 rpm Serial ATA drive (8 MB cache) 2nd hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) – available in Winter 2004 2nd hard drive, 36 GB 10K rpm Serial ATA drive (8 MB cache) 2nd hard drive, 74 GB 10K rpm Serial ATA drive (8 MB cache) 2nd hard drive, 73 GB 10K Ultra320 SCSI drive 2nd hard drive, 300 GB 10K Ultra320 SCSI drive 2nd hard drive, 36 GB 15K Ultra320 SCSI drive 2nd hard drive, 73 GB 15K Ultra320 SCSI drive 2nd hard drive, 146 GB 15K Ultra320 SCSI drive

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Standard Features - Custom Components

3rd Hard Disk Drive – One of the following	3rd hard drive, 73 GB 10K Ultra320 SCSI drive 3rd hard drive, 300 GB 10K Ultra320 SCSI drive 3rd hard drive, 36 GB 15K Ultra320 SCSI drive 3rd hard drive, 73 GB 15K Ultra320 SCSI drive 3rd hard drive, 146 GB 15K Ultra320 SCSI drive
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
Memory – One of the following	256 MB DDR-2 PC2-3200 (400 MHz) ECC Registered (1 x 256 MB) 512 MB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 256 MB) 1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 512 MB) 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1 GB) 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 512 MB) 3 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1 GB + 2 x 512 MB) 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 2 GB) 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 1 GB) 6 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 2 GB + 2 x 1 GB) 8 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 2 GB)
Removable Storage	1.44-MB Diskette Drive 48X CD-ROM Drive 48X/32X/48X CD-RW Drive 16X/40X DVD-ROM Drive 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive 8X DVD+R/RW Drive
2nd Removable Storage	48X/32X/48X CD-RW Drive 16X/40X DVD-ROM Drive 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive 8X DVD+R/RW Drive
Keyboard – One of the following	PS/2 Standard Keyboard USB Standard Keyboard
Mouse – One of the following	PS/2 2-Button Scroll Mouse PS/2 3-Button Mouse USB 2-Button Optical Scroll Mouse USB 3-Button Optical Mouse
Audio	Integrated Digital AC97 audio with internal speaker Sound Blaster Audigy 2 ZS PCI

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Standard Features - Custom Components

NIC	Broadcom 5782 10/100/1000 (PCI)
Graphics	NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI – up to 2 of these two cards can be integrated in the factory) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro NVS 280 PCI Express (64 MB, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) NVIDIA Quadro FX 3400 PCI Express (256 MB)
Miscellaneous	Solenoid lock and hood sensor IEEE 1394 PCI Card
Software	Symantec Norton AntiVirus 2004 (optional)* HP Performance Tuning Framework* Altiris Recovery* HP Client Manager Software v6.0* * Not available with Linux Operating System

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Standard Features - Specs

Operating System (choice)	Microsoft Windows XP Professional*	
	OR Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit only)	
	OR HP Installer Kit for Linux (includes drivers for both 32-bit & 64-bit OS versions on xw8200, xw6200, xw4200)	
Form factor	Minitower	
Color	Carbonite/Alloy metallic	
System Board Form Factor	Non-standard ATX	
Processor	Single or dual Intel Xeon processors (Nocona) with EM64T and Hyper-Threading Technology	
CPU Bus Speed Supported	800 MHz FSB	
Standard L2 Cache	1 MB L2 cache	
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	• Two 3.5 inch bays with acoustic dampening rail assemblies	
External Bays	• 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 • One 3.5 inch bay for optional floppy drive	
Parallel Port	1	
Serial Port	1	
Front I/O	2 USB 2.0, Headphone, Microphone, optional IEEE 1394	
Rear I/O	6 USB 2.0, 1 standard serial port, 1 parallel port, PS/2 keyboard and mouse, 1 RJ-45 to integrated Gigabit LAN, Audio In, Audio Out, Mic In	
USB Keyboard	Optional	
USB Mouse	Optional	
PS/2 Keyboard	1	
PS/2 Mouse	1	
Chassis Dimensions (H x W x D)	17.3 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)
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	

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Preinstalled Software
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
* Not available on Linux

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Standard Features - Preconfigured Global Models

xw6200X/XD2.8/B80/ H1.0/280E/dF/s	**Processor**	Intel Xeon processor 2.80 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	80 GB SATA/150 7200 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	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
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Standard Features - Preconfigured Global Models

xw6200X/XD3.2/C74/ H1.0/280E/dF/s	**Processor**	Intel Xeon processor 3.20 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	74 GB SATA/150 10,000 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	Includes Floppy Drive and Standard PS/2 Keyboard

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

N. America	PM199AW#ABA	**Switzerland** (German/French)	PM199AW#AR8
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UK	PM199AW#ABU	**Korea**	PM199AW#AB1
Germany	PM199AW#ABD	**China**	PM199AW#AB2
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Standard Features - Preconfigured Global Models

xw6200X/XD3.2+/B80/ H1.0/280E/dF/s	**Processor**	Dual Intel Xeon processors 3.20 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2 per processor
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	80 GB SATA/150 7200 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	Includes Floppy Drive and Standard PS/2 Keyboard

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

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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
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Standard Features - Preconfigured Global Models

xw6200X/XD3.4/C74/ H1.0/280E/dF/s	**Processor**	Intel Xeon processor 3.40 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	74 GB SATA/150 10,000 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	Includes Floppy Drive and Standard PS/2 Keyboard

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

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Japan (English)	PM200AW#ACF	**Denmark**	PM200AW#ACE
Japan (Japanese)	PM200AW#ABJ	**Asia/Pacific** (English)	PM200AW#AB4
UK	PM200AW#ABU	**Korea**	PM200AW#AB1
Germany	PM200AW#ABD	**China**	PM200AW#AB2
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Italy	PM200AW#ABZ	**India**	PM200AW#ACJ
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Standard Features - Preconfigured Global Models

xw6200X/XD3.4+/B80/ H1.0/280E/dF/s	**Processor**	Dual Intel Xeon processors 3.40 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2 per processor
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	80 GB SATA/150 7200 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	Includes Floppy Drive and Standard PS/2 Keyboard

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

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Germany	PD900AW#ABD	**China**	PD900AW#AB2
France	PD900AW#ABF	**Taiwan**	PD900AW#AB0
Italy	PD900AW#ABZ	**India**	PD900AW#ACJ
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Standard Features - Preconfigured Global Models

xw6200X/XD3.4+/C74/ H2/280E/dF/s	**Processor**	Dual Intel Xeon processors 3.40 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2 per processor
	Memory	2 GB (2x1GB) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	74 GB SATA/150 7200 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	Includes Floppy Drive and Standard PS/2 Keyboard

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

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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
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Standard Features - Preconfigured Global Models

xw6200X/XD3.6/C74/ H1.0/280E/dF/s	**Processor**	Intel Xeon processor 3.60 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	74 GB SATA/150 10,000 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	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

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Standard Features - Preconfigured Global Models

xw6200X/XD3.6+/B80/ H1.0/280E/dF/s	**Processor**	Dual Intel Xeon processors 3.60 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2 per processor
	Memory	1 GB (2x512) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	80 GB SATA/150 7200 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	Includes Floppy Drive and Standard PS/2 Keyboard

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

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Standard Features - Preconfigured Global Models

xw6200X/XD3.6+/C74/ H2/280E+/dF/s – Trader station	**Processor**	Dual Intel Xeon processors 3.60 GHz 1 MB/800 MHz FSB with EM64T
	OS	Microsoft Windows XP Professional
	Cache Memory	1 MB L2 per processor
	Memory	2 GB (2x1) DDR2-400 ECC Registered
	Optical Drive	16X DVD-ROM
	Hard Drive	74 GB SATA/150 10,000 rpm (1st)
	Graphics	NVIDIA Quadro NVS 280 PCI Express included in base configuration - Alternative graphics card options should be ordered separately - they are listed below: NVIDIA Quadro NVS 280 PCI (64 MB, VGA & DVI, can be added as second card) NVIDIA Quadro NVS 400 PCI (64 MB, quad head, VGA & DVI) NVIDIA Quadro FX 330 PCI Express (64 MB) ATI FireGL V3100 PCI Express (128 MB) NVIDIA Quadro FX 1300 PCI Express (128 MB) ATI FireGL V5100 PCI Express (128 MB) (available September 2004) NVIDIA Quadro FX 3400 PCI Express (256 MB) **NOTE:** Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP scroll mouse (PS/2)
	Other	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

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After-Market Options

Processors	**2nd Intel Xeon™ processor with EM64T extensions and Hyper-Threading**			
	Intel Xeon processor at 2.8 GHz with 800 MHz FSB & 1 MB of L2 cache			DY665A
	Intel Xeon processor at 3.0 GHz with 800 MHz FSB & 1 MB of L2 cache			DY666A
	Intel Xeon processor at 3.2 GHz with 800 MHz FSB & 1 MB of L2 cache			DY667A
	Intel Xeon processor at 3.4 GHz with 800 MHz FSB & 1 MB of L2 cache			DY668A
	Intel Xeon processor at 3.6 GHz with 800 MHz FSB & 1 MB of L2 cache			DY669A
Operating Systems	Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit)			PD862A
	Red Hat Enterprise Linux Workstation 3 Update 2 (64-bit)			PD863A
Graphics	**Multi display solutions**	**PCI**	**PCI-Express**	
	NVIDIA Quadro NVS 280 (64 MB, VGA & DVI)	X		AA932A
	NVIDIA Quadro NVS 400 (64 MB, quad head, VGA & DVI)	X		AA605A
	Quadro NVS 400 DVI cables	NA		AA606A
	NVIDIA Quadro NVS 280 PCI-E (64 MB, VGA & DVI)		X	DY650A
	DMS-59 to Dual DVI Cable for NVS cards	X	X	DL139A
	NVIDIA Quadro FX 330 (64 MB)		X	PB332A
	ATI FireGL V3100 (128 MB)		X	PE949A
	NVIDIA Quadro FX 1300 (128 MB)		X	PB331A
	ATI FireGL V5100 (128 MB)		X	PB330A
	NVIDIA Quadro FX 3400 (256 MB)		X	PB329A
Hard Drives	**SATA Hard Drives**			
	40 GB SATA/150 Hard Drive (7200 rpm)			PB371A
	80 GB SATA/150 Hard Drive (7200 rpm)			DE705A
	160 GB SATA/150 Hard Drive (7200 rpm)			DE706A
	250 GB SATA/150 Hard Drive (7200 rpm)			DS702A
	36 GB SATA/150 Hard Drive (10,000 rpm)			DU962A
	74 GB SATA/150 Hard Drive (10,000 rpm)			DX760A
	SATA power cable kit (2 per kit)			DN733A
	xw6200 SATA data cable			DY662A
	SCSI Hard Drives			
	73 GB Ultra320 SCSI Hard Drive (10,000 rpm)			AA613A
	300 GB Ultra320 SCSI Hard Drive (10,000 rpm)			DY672A
	36 GB Ultra320 SCSI Hard Drive (15,000 rpm)			AA616A
	73 GB Ultra320 SCSI Hard Drive (15,000 rpm)			AA617A
	146 GB Ultra320 SCSI Hard Drive (15,000 rpm)			DY671A
	Bracket HDD 3.5to5.25 xw6200			DY659A
	Cable, 3 port SCSI xw4200/6200			DY661A

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After-Market Options

Controllers	**SCSI Controllers**	**PCI**	**PCI-Express**	
	U320 SCSI Controller RAID 0,1 & external connector	X		DZ554A
	Ultra320 SCSI RAID Adaptec 2120S (Windows only, includes external connector)	X		AA850A
Storage devices	256 MB USB 2.0 Drive Key II (Available Fall 2004)			PH657A
	1.44 MB Internal Floppy Drive			DY670A
Input/Output Devices	**Keyboards**			
	HP PS/2 Standard Keyboard (Carbonite/Silver)			DT527A
	HP USB Standard Keyboard (Carbonite/Silver)			DT528A
	HP USB 2004 Modular Keyboard			DT530A
	Pointing Devices			
	HP PS/2 2-Button Scroll Mouse (Carbonite)			DD440B
	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)			DC172B
	HP PS/2 3-Button Mouse			AA778A
	HP USB Optical 3-button mouse			DY651A
	USB Spaceball 5000			DV675A
	USB SpaceMouse			DZ203A
Networking	**NICs**	**PCI**	**PCI-Express**	
	Intel Pro/1000MT	X		DC193A
	HP Gigabit by Broadcom (BCM5782)	X		DC194A
Memory (DIMMs)	**400 MHz DDR-2 PC2-3200 ECC Registered DIMMs**			
	256 MB DDR-2 PC2-3200 (400 MHz) ECC Registered			DY656A
	512 MB DDR-2 PC2-3200 (400 MHz) ECC Registered			DY658A
	1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered			DY655A
	2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered			DY657A
Monitors	**TFTs**			
	HP TFT L2335 (23-inch)			P9615W#
	HP TFT L2035 (20.1-inch)			P9614W#
	HP TFT L1925 (19.1-inch)			P9626A
	CRTs			
	HP P1230 (22-inch)			P9613A
Multimedia		**PCI**	**PCI-Express**	
	IEEE1394 Firewire PCI card (Windows only)	X		PA997A

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After-Market Options

Optical Drives	**DVD-ROM Drive**	
	16X/40X DVD-ROM w/ +R read	AA620A
	CD-ROM Drive	
	48X Max CD-ROM Drive	DC143B
	CD-RW Drive	
	48X/32X/48X CD-RW Drive	DE205A
	Combo Drive	
	48X/32X Combo DVD-ROM/CD-RW Drive	DE206A
	DVD+R/+RW Drive	
	8X 4.7GB DVD+R/+RW Drive (Windows version)	DS703A
	8X 4.7GB DVD+R/+RW Drive (Linux version)	DT839A
	1.44MB Internal Floppy Disk Drive	D5710B
Removable Storage	256 MB USB 2.0 II Drive Key	PH657A
	HP DAT24i Internal DDS3 tape drive	C1555D
	HP DAT24e External DDS3 tape drive	C1556D
	HP DAT40i Internal DDS4 tape drive	C5686B
	HP DAT40e External DDS4 tape drive	C5687C
	HP DAT72i Internal DAT72 tape drive	Q1522A
	HP DAT72e External DAT72 tape drive	Q1523A
Security	Chassis clamp lock, universal, no cable	DE817A
	Chassis clamp lock, universal, with cable	DE818A
Brackets/Stands	xw6200 sliding rack kit	DY663A
	Depth Adjustable Rails (stationary)	332558-B21
	Sliding Shelf kit	234672-B21
	Fixed shelf kit	253449-B21
Other Devices	IDE Cable Kit xw62/82 (2nd)	DY660A
	Front Card Guide and Fan Kit	DY648A
Software	HP Remote Graphics V2 LTU for HP WS	PE672A
	HP Remote Graphics V2 LTU for non-HP	PE673A
	HP Remote Graphics V2 Rcvr LTU	PE674A
	HP Remote Graphics V2 software media	PE675A
	Remote Workstation Sender SW Module	DM497A
	Remote Workstation Receiver SW Module	DM498A

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E7525 chipset

DDR-2 SDRAM ECC REGISTERED MEMORY

It is not necessary to add memory in pairs. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The Intel E7525 chipset supports ECC Registered 400 MHz (PC2-3200) DDR-2 memory only.

If only using one DIMM, install it in socket 1. Additional DIMM slots should be populated consecutively; socket 2, then 3, 4, etc. For best performance 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 as single DIMMs (two 512 MB DIMMs will have better performance than a single 1 GB DIMM). For efficient dual-channel performance, each pair of DIMMs must be same size and same DRAM technology. If mixing single sided and double sided memory, load the double sided DIMM pairs first. ECC Registered memory must be used.

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

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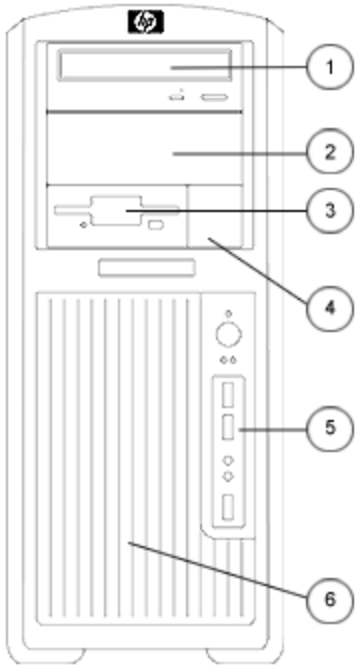
Tower configuration



	Quantity Supported	Position Supported	Controller
Convertible Minitower			
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

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Additional Technical Specifications

System Board	
Architecture	Xeon EM64T/PCI-E
Chipset	Intel E7525/ICH5R Chipset
Super I/O Controller	SMSC LPC47B397
System Board Form Factor	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	• RAID 0 and RAID 1 • Supports one RAID array on 2 ports • Creation of 2 drive HDD array
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
HDD activity LED Header	Yes, 2 & 4 pin
PCI extender that connects to System Board	None

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Cooling	
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

Power Supply			
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		
	Input Power consumption	**@ 120Vac/60Hz**	
	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

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ROM Features	Description
Instantly Available PC	Allows for very low power consumption with quick resume time
ROM Based F10 Setup and diagnostics	Review and customize BIOS settings
Remote System Installation via F12 (PXE) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system
System/Emergency ROM Flash Recovery with Video	Recovers corrupted system BIOS
ROM revision levels	• 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
System board revision level	• Allows management SW to read the revision level of the system board Revision level is digitally encoded into the hardware and cannot be modified
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: • NORMAL – normal temperature ranges • ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown • SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs
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	• System administrators can power on, restart, and power off a client computer from a remote location. • Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM
ACPI (Advanced Configuration and Power Management Interface)	• Allows the system to wake from a low power mode • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system Supports ACPI 2.0 for full compatibility with 64-bit operating systems
Keyboard-less Operation	The system can be operated without a keyboard
SMBIOS	System Management BIOS 2.3.5, previously known as DMI BIOS, for system management information
Localized ROM Setup	Common BIOS image supports configuration (Setup) in 11 languages, with local keyboard mappings
Asset tag	Allows user or MIS to set unique tag string in ROM
Ownership tag	Allows user or MIS to set unique tag string in ROM
Memory Scrubbing	Allows memory controller to transparently correct transient ECC errors in the background
Memory Remapping	Allows system memory lost to PCI devices to be reclaimed above 4 GB, for use with operating systems that support more than 4 GB (Windows XP 64-bit edition, Linux)
Per-slot control	Allows individual slot configuration (option ROM., latency)
Adaptive cooling	Fan control parameters are set according to detected hardware configuration for optimal acoustics
Pre-boot diagnostics	Early (pre-video) critical errors are reported via beeps and blinks on the power LED

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Other deployment & management features	
HP Client Management Solutions	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. 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: ● Get valuable hardware information such as CPU, memory, video, and security settings ● Monitor system health to fix problems before they occur ● Install drivers and BIOS updates without visiting each PC ● Remotely configure BIOS and security settings ● Automate processes to quickly resolve hardware problems Additional Altiris solutions (fee-based) are available to address Workstation management challenges through the entire IT lifecycle including: ● Inventory assessment ● Software license compliance ● Personality migration ● Software image deployment ● Software distribution ● Asset management ● Client backup and recovery ● Problem resolution Visit http://www.hp.com/go/easydeploy for more information, to download HP Client Manager Software, and to evaluate the Altiris solutions.
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	● Repository for storing company-specific property asset numbers for easy tracking ● Initially set equal to the system serial number ● Stored in a protected section of non-volatile memory that can be accessed and modified with the F10 Setup program
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
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: ● single bit errors double bit errors

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	• an odd number of errors • error bursts up to 32-bits long
Drive Self Tests (DPS)	• Drive Protection System (Adaptec and LSI SCSI controllers do not offer DPS) • 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. • 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. 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)
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

Security Features	
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.

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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
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

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Service and Support	On-site Warranty and Service (Note 1): This three-year, limited warranty and service offering delivers three years of on-site, next business-day (Note 2) service for parts and labor and includes free telephone support (Note 3) 24 x 7. Global coverage (Note 2) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering.
	NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply.
	NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.
	NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

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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)
	NOTE: *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.	
	Sampling	7 kHz – 48 kHz
	Wavetable Syntheses (software)	Yes – GM and FM Midi Support, Direct Music and Down Loadable Soundset (4 Meg DLS Level 1 and 2 Support)
	3D Positional Sound	No
	Digital Audio	Yes
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	3W
	Internal Speaker	Yes
	Hardware Equalizer for Internal Speaker	Fixed 7 Band ParametricEQ
	External Speaker Jack (Line-Out)	Yes

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Technical Specifications - Communications

HP Gigabit by Broadcom (BCM5782) **NIC**	**Connector**	RJ-45	
	Controller	Broadcom 5782 PCI LAN Controller	
	Memory	Integrated 96Kb frame buffer memory	
	Data rates supported	10/100/1000 Mbps	
	Compliance	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	Bus architecture	PCI 2.2	
	Data path width	32-bit, 33/66 MHz bus interface	
	Data transfer mode	Bus-master DMA	
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance	
	Boot ROM support	Yes	
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps	
		10BASE-T (full-duplex) 20 Mbps	
		100BASE-TX (half-duplex) 100 Mbps	
		100BASE-TX (full-duplex) 200 Mbps	
		1000BASE-T, 1000 Mbps	
	Environmental	**Operating temperature**	32° to 131° F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Dimensions	4.7 x 2.0 x 0.08 in (12 x 5 x 1.9 cm)	
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4	
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility	
	Alerting	ASF 1.0	
	Kit contents	Broadcom 5782, CD, Broadcom Gigabit Ethernet for HP, drivers, quick install guide, product warranty statement	

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Technical Specifications - Communications

Intel Pro 1000 MT Gigabit NIC	**Connector**	RJ-45	
	Controller	Intel 82540EM Gigabit Controller	
	Memory	Integrated 96Kb frame buffer memory	
	Data rates supported	10/100/1000 Mbps	
	Compliance	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	Bus architecture	PCI 2.2	
	Data path width	32-bit, 33/66 MHz bus interface	
	Data transfer mode	Bus-master DMA	
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance	
	Boot ROM support	Yes	
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps	
		10BASE-T (full-duplex) 20 Mbps	
		100BASE-TX (half-duplex) 100 Mbps	
		100BASE-TX (full-duplex) 200 Mbps	
		1000BASE-T, 1000 Mbps	
	Environmental	**Operating temperature**	32° to 131° F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)
	Dimensions	6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm)	
	Operating system driver support	Microsoft® Windows® NT® 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4	
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility	
	Kit contents	The Intel Pro 1000 MT NIC, CD containing Intel PROset II NIC drivers, quick install guide, product warranty statement	

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Technical Specifications - Controllers

LSI Logic LSI20320 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 VHDCI
	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
	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
	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.

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Technical Specifications - Hard Drives

7200 rpm Serial ATA Hard Drives	**40GB**	**Capacity**	40020664320 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	2 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
			Average	8.5 ms
			Full-Stroke	18.0 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	78,165,360	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	80GB	**Capacity**	80026361856 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	156,301,488	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	160GB	**Capacity**	160041885696 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	312,581,808	
		Operating Temperature	32° to 140° F (0° to 60° C)	

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	250GB	**Capacity**	250059350016 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.8 ms
			Average	<9.0 ms
			Full-Stroke	≤17 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	488,397,168	
		Operating Temperature	41° to 131°F (5° to 55°C)	
10,000 rpm SATA Hard Drives	**36GB**	**Capacity**	37,019,566,080 bytes	
		Height	1.0 in (2.54 mm)	
		Width	Media diameter: 3.3 in (84mm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 ms
			Average	4.5 ms
			Full-Stroke	10.2 ms
		Rotational Speed	10,000 rpm	
		Logical Blocks	72,303,840	
		Operating Temperature	41° to 131° F (5 to 55° C)	
	74GB	**Capacity**	74,355,769,344 bytes	
		Height	1.0 in (2.54 mm)	
		Width	Media diameter: 3.3 in (84mm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 ms
			Average	4.5 ms
			Full-Stroke	10.2 ms
		Rotational Speed	10,000 rpm	
		Logical Blocks	145,226,112	
		Operating Temperature	41° to 140° F (5 to 60° C)	

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Technical Specifications - Hard Drives

Ultra320 SCSI Hard Drives (10,000 rpm)	**73GB**	**Capacity**	73,407,865,856 bytes	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	68 pin LVD SCSI	
		Synchronous Transfer Rate (Maximum)	320 MB/s	
		Buffer	8 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 msec
			Average	<4.5 msec
			Full-Stroke	<11.0 msec
		Rotational Speed	10,000 rpm	
		Logical Blocks	143,374,738	
		Operating Temperature	40° to 130° F (5° to 55° C)	
	300GB	**Capacity**	300,000,000,000 bytes	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	68 pin LVD SCSI	
		Synchronous Transfer Rate (Maximum)	320 MB/s	
		Buffer	8 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 msec
			Average	<4.5 msec
			Full-Stroke	<11.0 msec
		Rotational Speed	10,000 rpm	
		Logical Blocks	585,937,500	
		Operating Temperature	40° to 130° F (5° to 55° C)	

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Technical Specifications - Hard Drives

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

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Technical Specifications - Removable Storage

USB Disk on Key	**Dimensions** (HxWxD)	0.9 x 0.7 x 3.9 in (2.3 x 1.8 x 9.8 cm)
	Weight	0.05 lb (0.02 kg)
	USB Specification	1.1 and 2.0
	Transfer Rate	Read-1023 KB/Sec; Write-850 KB/Sec
	Storage Media	Solid state flash memory, no moving parts
	Power Supply	USB Bus-powered, no external power required
	Capacity	256 MB

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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 ± 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
		Microsoft® PC 99 - 2001	Functionally compliant
	Mechanical	**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
		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
	Operating system support	Windows® 2000 and Windows XP	
	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	

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Technical Specifications - Input/Output Devices

USB Modular Keyboard	**Physical characteristics**	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.59 x 6.73 x 0.90 in (472 x 170 x 23 mm) with numeric pad attached
		Weight	2 lb (0.9 kg) minimum
	Electrical	**Operating voltage**	+ 5VDC ±5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	USB Type A plug connector
		ESD	CE level 4, 15-kV air discharge
		EMI - RFI	Conforms to FCC rules for a Class B computing device
		Microsoft® PC 99 - 2001	Functionally compliant
	Mechanical	**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
		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)	442 in (107 cm) on concrete, 16-drop sequence
	Operating system support	Windows® 2000 and Windows XP	
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, USB-IF	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	
	Kit contents	Keyboard, numerical keypad, USB cable, I/O Security Software & Documentation CD including Modular Access Keyboard software & installation guide, warranty card, safety and comfort guide	

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Technical Specifications - Input/Output Devices

2-Button Scroll Mouse (PS/2)	**Scroll Wheel**	8 mm	
	Maximum Rotation Speed	30 mm/s	
	Switch Type	Light force micro-switch	
	Switch Life	1 million operations	
	Mechanical Life	Minimum 200,000 revolutions	
	Environmental	**Operating Temperature**	50° to 122° F (10° to 50° C)
		Non-operating Temperature	-22° to 140° F (-30° to 60° C)
		Operating Humidity	10% to 90% (non condensing at ambient)
		Non-operating Humidity	20% to 80% (non condensing at ambient)
		Operating Shock	40 g, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration
	Mechanical	**Resolution**	400 ± 20% DPI
		Tracking Speed	10 in/s maximum
		Acceleration	100 in/s
		Switch Actuation	85 g nominal peak force
		Switch Life	1,000,000 operations (using Hasco modified tester)
		Cable Length	2 m
		PC98-99	Mechanically compliant
	Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick	

HP 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® 95, 98, 2000, Me, and XP	

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)
		Operating humidity	10% to 90% (non condensing at ambient)
	Mechanical	**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

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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)
		Non-operating humidity	5% to 80% (non-condensing at ambient)
	Mechanical	**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
	System Requirements	**Disk Space**	10 MB free disk space
	Regulatory Approvals	UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick	

HP SpaceMouse Plus USB	**Physical characteristics**	**Dimensions** (H x W x D)	7.4 x 4.72 x 1.73 in (18.8 x 12.0 x 4.4 cm)
		Cap Diameter	2 x 6.5 x 6.6 mm
		Weight	1.5 lb (0.68 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**	41° to 140° F (5° to 60° C)
		Non-operating temperature	-13° to 158° F (-25° to 70° C)
		Operating humidity	10 to 98 % RH (non-condensing)
		Non-operating humidity	10 to 98 % RH (non-condensing)
	Mechanical	**Buttons**	11 programmable (unshifted)
		Cap Force Range	0.2 N – 4.5 N
		Cap Torque Range	4 Nmm to 100 Nmm
		Resolution	8 bit
	USB Specifications	**Connector**	USB 1.1 or greater
		Cable Length	2 m
		Data Rate	16 msec
	Software Drivers Available	**Microsoft Windows XP**	
	System Requirements	**Disk Space**	10 MB free disk space
	Regulatory Approvals	UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick	

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1394 Firewire FH/LP Card (PCI)	**Device Interface Protocol**	IEEE-1394a	
	Data Rate	100Mbits/s, 200Mbit/s and 400Mbits/s	
	Devices Supported	IEEE-1394 compliant devices	
	Connectors	Two IEEE1394 6-Pin Connector (Bracket Side) One 10-Pin (9 Contacts) Custom Connector (Internal)	
	Bus Interface	PCI	
	Physical	Low profile PCI card with a full height bracket	
	Environmental	**Operating temperature**	32° to 104° F (0° to 50° C)
		Non-operating temperature	-13° to 158° F (-25° to 70° C)
		Relative humidity	5% to 95%
		Ports	3 cable ports
	Minimum System Requirements	Microsoft XP Professional or Red Hat Linux 7.3/9.0 (Class Driver) Pentium II 266 or faster 64-MB RAM Available PCI slot CD-ROM drive	
	Regulatory Agency Approval	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwan BSMI CNS13438, Korea MIC	

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Technical Specifications - Optical Devices

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

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16X/40X DVD-ROM Drive with +R Read Support	**Height**	5.25-in, half-height, tray load	
	Interface Type	ATAPI/EIDE	
	Dimensions (W x H x D)	5.88 x 1.71 x 7.87 [max] in (149.5 x 43.25 x 200.0 [max] mm) (external, excluding bezel)	
	Disc Formats	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW	
	Disc Capacity	**DVD-ROM**	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R)
		CD-ROM	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)
	Access Times (typical reads, including settling)	**DVD-ROM Single Layer**	120 ms
		CD-ROM Mode 1	90 ms
		Full Stroke DVD	240 ms (seek)
		Full Stroke CD	160 ms (seek)
		Startup Time	< 10 seconds (typical)
		Stop Time	< 4 seconds
		Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)
	Maximum Data Transfer Rates	**CD-ROM Read**	6000 KB/s (40X) Max
		DVD-ROM Read	21,600 KB/s (16X) Max
		Digital Audio Extraction	6000 KB/s (40X) Max
	Power	**Source**	Four-pin, DC power receptacle
		DC Power Requirement	5 VDC ± 5% – 100 mV ripple p-p
			12 VDC ± 5% – 200 mV ripple p-p
		DC Current	5 VDC – <800 mA typical, < 1000 mA maximum
			12 VDC – < 870 mA typical, <1800 mA maximum
	Audio Output	**Line-Out**	0.7 VRMS
		Signal-to-Noise Ratio	85 dB
		Channel Separation	65 dB
	Configuration Jumper Block	Master, slave, and cable select modes	
	Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
	Operating Environmental (all conditions non-condensing)	**Temperature** (operating)	41° to 122° F (5° to 50° C)
		Relative Humidity (operating)	10% to 85%
		Maximum Wet Bulb Temperature (operating)	86° F (30° C)
	Certifications, Approvals	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, 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	
	Operating Systems Supported	Microsoft Windows 2000, Windows XP Professional	
	Kit Contents	16X/40X DVD-ROM Drive, InterVideo WinDVD MPEG Movie Playback software, audio cable, and installation guide.	

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Technical Specifications - Optical Devices

HP 48X CD-RW	**Height**	5.25-inch, half-height, tray-load	
	Mounting Orientation	Horizontal or vertical	
	Interface	ATAPI/EIDE	
	Dimensions (HxWxD)	1.63 x 5.75 x 7.27 [max] in (4.13 x 14.6 x 18.5 [max] cm) (external, excluding bezel)	
	Weight (max)	2.0 lb (0.9 kg)	
	Read Only Disc Parameters	**Data Transfer Rates – Read**	Digital audio extraction (minimum) – 1,800 KB/s (12X)
			CD read – up to 7,200 KB/s (48X)
		Media and Formats – Read	**Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed Mode, CD-Plus, CD-Extra, CD-I FMV, Video CD, CD-Text, Photo CD (single and multisession)
			Media: stamped, CD-R, CD-RW
	Writeable Disc Parameters	**Data Transfer Rates – Write**	CD-R write – 2100 KB/s (14X) to 7200 KB/s (40X)
			CD-RW write – 600 KB/s (4X)
			CD-RW write (high speed) – 1500 KB/s (10X) to 1800 KB/s (12X)
			CD-RW write (ultra high speed) – 2400 KB/s (16X) to 4800 KB/s (32X)
		Media and Formats – Write	**Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed Mode, CD-Plus, CD-Extra, CD-I FMV, Video CD, CD-Text
			Media: CD-R, CD-RW (including ultra-speed)
		Write Methods	Disc-at-once, session-at-once,, track-at-once, incremental fixed and variable packet, multisession
	Access Times (typical reads, including settling)	**CD-ROM Mode 1**	125 ms
		Full Stroke CD	210 ms (seek)
		Start-up Time (typical)	<7 s (single session), <30 s (multisession)
		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 ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)
		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%

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	Approvals/ Environmental	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec SFF-8020, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft ®PC2001 certification, Microsoft Logo for Windows® XP and 2000.
	Operating Systems Supported	Microsoft Windows® 2000, Windows XP Professional
	Supplied software	Roxio Easy CD & DVD Creator: Create or copy CDs and DVDs, including music and data CDs, and data DVDs Dantz Retrospect Express: Back up systems to CD, DVD, or tape media.

48X Combo CD-RW/DVD-ROM	**Height**	5.25-inch, half-height, tray-load	
	Mounting Orientation	Either horizontal or vertical	
	Interface Type	ATAPI/EIDE	
	Dimensions (W x H x D)	5.77 x 1.71 x 7.87 [max] in (14.66 x 4.34 x 20.0 [max] cm) (external, excluding bezel)	
	Weight (max)	2.6 lb (1.2 kg)	
	Read Only Disc Parameters	**Formats and Modes Supported**	CD-ROM-Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD-Bridge; CD digital audio; CD Extra; CD-I-Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multisession , and DVD+RW
		Capacity	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10)
		CD-ROM, CD-R, CD-RW read	7200 KB/s (48X) Max
		DVD ROM read	21,632 KB/s (16X) Max
	Writeable Disc Parameters	**Disc Type**	CD-R and CD-RW
		Write Methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
		Format and Modes Supported	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD; CD-Bridge; Video CD
		Capacity	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (mode 2, 12 cm)
		CD-R write	7200 KB/s (48X) Max
		CD-RW write	4800 KB/s (32X) Max
	Access Times (typical reads, including settling)	**Random DVD**	< 140 ms (typical)
		Random CD	< 125 ms, (typical)
		Full Stroke DVD	< 250 ms (seek)
		Full Stroke CD	< 210 ms (seek)
		Startup Time (single)	< 7 seconds (typical)
		Startup Time (multi-session)	< 30 seconds (typical)
		Stop Time	< 4 seconds
		Cache Buffer	2 MB (minimum)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 44 Mbytes/s (default)

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	Power	**Source**	Four-pin, DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum) 12 VDC (< 600 mA typical, < 1400 mA maximum)
		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	
	Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
	Operating Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative humidity	10% to 90%
		Maximum wet bulb temperature	86° F (30° C)
	Certifications, Requirements	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec SFF-8020, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft® PC2001 certification, Microsoft Logo for Windows® XP and 2000.	
	Operating Systems Supported	Microsoft Windows 2000, Windows XP Professional	
	Option Kit Contents	48X Combo CD-RW/DVD-ROM Drive, Roxio Easy CD & DVD Creator, InterVideo WinDVD MPEG Movie Playback software, Dantz Retrospect Express Backup software, audio cable, and installation guide.	
8X DVD+R/+RW	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface Type	ATAPI/EIDE	
	Disc Recording Capacity	4.7 GB	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Recording Method	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet	
	Write Support	DVD+R, DVD+RW, CD-R, CD-RW	
	Read Support	DVD-ROM (single- and dual-layer), DVD-Video, DVD+R (include multisession), DVD+RW, DVD-R (incl. multiborder), DVD-RW; 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	
	Write Speed (max)	**DVD+R**	8X CLV (10800 KB/s)
		DVD+RW	4X CLV (5400 KB/s)
		CD-R	24X CLV (3600 KB/s)
		CD-RW	10X CLV (1500 KB/s)
	Read Speed (max)	**DVD-ROM**	12X CAV (6750 to 16200 KB/s)
		DVD+R, DVD+RW,	8X CAV (5400 to 10800 KB/s)
		CD-ROM, CD-R, CD-RW, CD-Audio	40X CAV (2550 to 6000 KB/s)

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Access Time (typical reads, including settling)	**Random DVD**	< 140 ms (typical)
	Random CD	< 125 ms, (typical)
	Full Stroke DVD	< 250 ms (seek)
	Full Stroke CD	< 210 ms (seek)
	Startup Time (single)	< 7 seconds (typical)
	Startup Time (multi-session)	< 30 seconds (typical)
	Stop Timex	< 4 seconds
	Cache Buffer	2 MB (minimum)
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 2 33 Mbytes/s (default)
Power	**Source**	Four-pin, DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
		12 VDC ± 10%-200 mV ripple p-p
	DC Current	5 VDC (< 2000 mA typical, < 2500 mA maximum)
		12 VDC (< 700 mA typical, < 2000 mA maximum)
	Total Drive Power (standby mode)	< 2.5 Watt
Audio Output	**Line-Out**	0.7 VRMS
	Signal-to-Noise Ratio	75 dB
	Channel Separation	55 dB
Operating Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
	Relative humidity	10% to 90%
	Maximum wet bulb temperature	86° F (30° C)
System Configuration	Intel® Pentium® III Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data	
Operating Systems Support	Microsoft® Windows® 2000, Windows XP Professional, Windows XP Home	
Regulatory Approvals	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft® PC2001 certification, Microsoft Logo for Windows® XP and 2000.	
Option Kit contents	DVD+R/+RW Drive, InterVideo WinDVD, InterVideo WinDVD Creator, Roxio Easy CD Creator, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media.	

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Technical Specifications - Graphics

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

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Technical Specifications - Graphics

NVIDIA Quadro NVS 280 Graphics Card (PCI-Express)	**Form Factor**	ATX	
	Graphics Controller	Integrated Quadro 280 2-D graphics processor unit (GPU)	
	VGA controller	Integrated into the Quadro GPU	
	Bus Type	PCI-Express x16 or PCI	
	RAMDAC	Dual 350 MHz integrated	
	Memory	64 MB 000 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage	
	Connectors	Single High-density Flex Connector	
	Multi-monitor support	Dual integrated analog display controllers supporting up to two analog displays at 1920 x1200 @ 85Hz or two digital displays at 1600x1200 @ 60Hz	
	Additional product features	**Controller clock speed**	250 MHz
		Color planes	32-bit color buffer
		Overlay planes	1 16-bit Video overlay plane
		Maximum vertical refresh rate	120 Hz
		Maximum pixel clock	350 MHz
		Single DVI Support	Yes
		Dual DVI Support	Yes
		High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content
			DVD-ready motion compensation for MPEG-2
			Independent hardware color controls for video overlay
			Hardware color-space conversion (YUV 4:2:2 and 4:2:0)
			IDCT motion compensation
			5-tap horizontal by 3-tap vertical filtering
			8:1 up/down scaling
	PCI-Express	Supports X16 PCI-E	
	Available graphics drivers	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: http://welcome.hp.com/country/us/eng/software_drivers.html.	

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Technical Specifications - Graphics

NVIDIA Quadro4 NVS 400 Graphics Card	**Form Factor**	ATX
	Graphics Controller	Integrated Quadro4 2D/3D 128-bit graphics processor unit (GPU)
	Bus Type	PCI
	RAMDAC	Dual 350 MHz
	Memory	64 MB 220 MHz, 4mx 32 DDR per GPU, 32-MB per GPU unified frame buffer
	Connectors	Dual LFH-60
	Dimensions	Low-profile form factor
	Multi-monitor support	1 to 4 displays with nView – with two cards (1 PCI per card), up to 8 monitors can be driven
	nView Hardware Architecture	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
	High-definition video processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT Motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	Supported graphics APIs	Fully compliant with OpenGL 1.3 and DirectX 8.1
	Available graphics drivers	Microsoft Windows XP and Microsoft Windows 2000, Linux See: http://www.hp.com/support/workstation_drivers/

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Technical Specifications - Graphics

NVIDIA Quadro FX 330 Graphics Card	**Form Factor**	ATX
	Graphics Controller	NVIDIA Nv37GL
	Bus Type	PCI-Express x16
	Memory	64 MB 000 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DMS-59 output supporting up to two analog or digital (with optional cable) displays
	Multi-monitor support	Dual integrated analog display controllers supporting up to two analog displays at 2048 x1536 @ 60Hz or two digital displays at 1600x1200 @ 60Hz
	RAMDAC	Dual 350 MHz integrated
	Architecture features	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
	Shading architecture	Fully programmable GPU Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL
	Supported graphics APIs	OpenGL 1.5 DirectX 9.0
	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: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Maximum Resolution	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

ATI FireGL V3100 Graphics Card	**Form Factor**	ATX
	Graphics Controller	RV370
	Bus Type	PCI-Express x16
	Memory	128MB 200MHz DDR unified frame buffer, Z-buffer and Texture storage
	Connectors	1 DVI-I analog/digital and 1 VGA analog monitor output
	Multi-monitor support	Dual integrated display controllers supporting up to 2048x1536 @ 85Hz on both displays
	RAMDAC	Dual 400 MHz integrated
	Architecture features	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
	Shading architecture	Smartshader™ technology Programmable pixel and vertex shaders 16 textures per pass Pixel shaders up to 160 instructinos 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
	Supported graphics APIs	OpenGL 1.5 DirectX 9.0
	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: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Maximum Resolution	DVI-I output – drives digital display at resolutions up to 1600x1200 Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 85Hz each

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Technical Specifications - Graphics

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

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NVIDIA Quadro FX 3400 Graphics Card	**Form Factor**	ATX
	Graphics Controller	NVIDIA NV45GL
	Bus Type	PCI-Express x16
	Memory	256 MB 450 MHz GDDR3 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	2 DVI-I (one dual-link/one single-link) 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 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
	RAMDAC	Dual 400 MHz integrated
	Architecture features	256-bit memory interface 128-bit IEEE floating-point precision graphics pipeline 128-bit color precision 12-bit sub-pixel precision 8x FSAA at 1920x1200, 4x at 2048x1536, rotated grid FSAA sampling algorithm Hardware accelerated antialiased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes 3rd generation occlusion culling 3D volumetric texture support Quad-buffered stereo Dual Link DVI enabling driving digital displays up to 3840x2400 (24Hz)
	Shading architecture	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
	Supported graphics APIs	OpenGL 1.5 DirectX 9.0
	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: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Maximum Resolution	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

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Technical Specifications - Graphics

ATI FireGL V5100 PCI-Express Graphics Controller	**Form Factor**	ATX
	Graphics Controller	RV423
	Bus Type	PCI-Express x16
	Memory	128 MB 350MHz DDR unified frame buffer, Z-buffer and Texture storage
	Connectors	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	Multi-monitor support	Dual integrated display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays.
	RAMDAC	Dual 400 MHz integrated
	Architecture features	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
	Shading architecture	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
	Supported graphics APIs	OpenGL 1.5 DirectX 9.0
	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: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Maximum Resolution	DVI-I output – drives digital displays at resolutions up to 1600x1200 Internal 400MHz RAMDAC – drives dual analog displays up to 2048x1536 @ 85Hz each

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

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Mechanical	**Dimensions** (H x W x D)	Unpacked (including pedestal)	19.1 x 19.5 x 18.8 in (48.6 x 49.5 x 47.7 cm)
		Packaged	25.6 x 25.0 x 25.4 in (65.1 x 63.6 x 64.6 cm)
		Unpacked	66.1 lb (30 kg)
		Packaged	77.1 lb (35 kg)
	Tilt Range	10° upward and 5° downward	
	Swivel Range	90°either side of center	
Environmental	**Temperature - Operating**	41° to 90° F (5° to 35° C) non-condensing	
	Temperature - Non-operating	-4° to 140° F (-20 to 60° C)	
	Humidity - Operating	10% to 90% non-condensing	
	Humidity - Non-operating	10% to 90%	
	Altitude - Operating	0 to 7,200 ft (0 to 2,195 m)	
	Altitude - Non-operating	0 to 30,000 ft (0 to 9,144 m)	
Other	**Accessories Included**	Power cable, video cable (D-sub to D-sub), documentation kit	
	User Guide Languages	English, French, German, Spanish, Italian, Dutch, Brazilian Portuguese, Danish, Finnish, Greek, Japanese, Korean, Latin American Spanish, Norwegian, Polish, Russian, Slovenian, Turkish, Swedish, Traditional Chinese, Simplified Chinese	
	Warranty Languages	English, French, Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Japanese, Korean, T. Chinese, S. Chinese	
	Color	Carbon and silver	
Certification and Compliance	MPR-II (Low Emissions), TCO '03, *Energy Star Compliant, UL Listing, ISO9241-3 VOT Guidelines Approval, FCC Approval, CE Mark (including PFC), GS Mark * Energy Star Compliant available summer of 2004.		
Compatibility	Compatible with platforms using the VESA standard video modes and HP Compaq Business Desktops d500, d300, and d200 Series, Compaq Evo Desktops, HP workstations, and HP Business Desktops d300 series.		
Service and Warranty	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.		

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HP Flat Panel Monitor L1925	**Panel**	**Type**	Thin film transistor (TFT)
		Viewable Image Area (diagonal)	19 in (48.25 cm) maximum viewable
		Screen Opening (WxH)	14.9 x 11.9 in (37.8 x 30.3 cm)
		Viewing Angle (typical)	170 degrees horizontal/170 degrees vertical (10:1 minimum contrast ratio)
		Brightness (typical)	Up to 250 nits (cd/m^2)
		Contrast Ratio (typical)	Up to 500:1 (typical)
		Response Rate (typical)	<20 ms (typical rise + fall)
		Pixel Pitch	0.294 mm
		Color Depth Support	16.7 million colors
	Video Input	**Plug and Play**	Yes (supports VESA DDC2B; PC2001 compliant)
		Input Signal	Two connectors: one 15-pin mini D-sub analog VGA; and one DVI-I (VGA analog or digital)
		Input Impedance	75 ohms ± 2%
		Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green
		Video Cable	VGA and DVI-D
		Video Cable Length	78 in (2.0 m)
	Signal Interface/ Performance	**Horizontal Frequency**	30 to 82 kHz
		Vertical Frequency	56 to 75 Hz
		Graphics Controller	Pixelworks 131
		Native Resolution	1280 x 1024 @ 75 Hz analog
			1280 x 1024 @ 60 Hz digital
		Maximum Resolution (Analog)	1280 x 1024 @ 75 Hz analog
		Maximum Resolution (Digital)	1280 x 1024@75Hz analog
	On Screen Display (OSD) **Controls**	**Preset VESA Graphic Modes** (non-interlaced)	640 x 480 @ 60 Hz, 72 Hz, 75 Hz
			800 x 600 @ 60 Hz, 72 Hz, 75 Hz
			1024 x 768 @ 60 Hz, 75 Hz
			1280 x 1024 @ 60 Hz, 75 Hz
		Preset MAC Mode	832 x 624 @ 75 Hz
			1152 x 870 @75 Hz
		Preset VGA Mode	640 x 480 @ 60 Hz, 72 Hz
		Preset SUN Mode	1152 x 900 @ 66 Hz
		Fail Safe Mode	Yes (limits out of range signal messages)
		Maximum Pixel Clock Speed	140 MHz
		User Programmable Modes	Yes, 10
		Anti-Glare	Yes
		Anti-Static	Yes
		AssetControl	Yes (accessible on HP/Compaq desktops featuring Intelligent Manageability)
		Default Color Temperature	Yes (6500k, 9300k, Custom User)
		Buttons or Switches	Power on/off; 4-button OSD; second level OSD buttons include auto adjust and dual-input switch

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	Languages	English, Spanish, French, German, Dutch, Italian	
	User Controls	Size and Positioning Contrast Brightness Clock, Clock Phase Selectable Color Temperature Input Selection Factory Reset Individual Color Contrast	
Power	**Power Supply**	Auto-ranging, 90 to 265 VAC; internal power supply, 47.5-63 Hz	
	Input Power	100 ~ 240 VAC	
	Nominal Current	1.5 A maximum	
	Frequency	50 ~ 60 Hz	
	Average	33 W when displaying standard office software	
	Maximum	< 40 W	
	Power Saving	< 2 W	
	Off Mode	< 1 W (switch off)	
	Power Cable Length	70 in (1.8 m); non-captive	
Mechanical	**Dimensions** (H x W x D)	**Unpacked with stand minimum height**	14.8 x 16.4 x 8.2 in (39.8 x 41.6 x 20.8 cm)
		Unpacked with stand maximum height	20 x 16.4 x 8.2 in (50.8 x 41.6 x 20.8 cm)
		Base Area (Footprint d x w)	8.2 x 12.2 in (20.8 x 30.9 cm)
		Panel only (without stand) (h x w x d)	13.5 x 16.4 x 2.6 in (34.2 x 41.6 x 6.6 cm)
	Weight	**Unpacked with stand**	17.6 lb (8 kg)
		Unpacked without stand	12 lb (5.5 kg)
		Packaged	23.5 l (10.7 kg)
	Tilt Range	-5° to +20°	
	Swivel Range	± 45° horizontal swivel	
	Height Adjustable	Yes (4.3 in/110 mm adjustment range)	
	Pivot Rotation	Yes, 90 °	
	Base	Ships attached and is removable after installation	
Environmental	**Temperature – Operating**	41° to 95° F (5° to 35° C)	
	Temperature – Non-operating	-4° to 140° F (-20° to 60° C)	
	Humidity – Operating	20% to 80%	
	Humidity – Non-operating	5% to 95%	
	Altitude – Operating	0 to 13,000 ft (0 to 4,000 m)	
	Altitude – Non-operating	0 to 40,000 ft (0 to 12,192 m) Full-screen Resolution	
Options	**PC Comm Station**	Communication/audio hub that includes two stereo speakers (8 PMPO each), integrated microphone/dual function headset (phone and PC support), and USB port. Optional, part number 304251-008 (US) or P8814A (EMEA).	
Other	**Accessories Included**	VGA cable, DVI-D cable, user CD-ROM with Portrait software	
	User Guide Languages	English	
	Warranty Languages	English	

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		Color	Carbon/Silver
		VESA Mounting	Yes (swing arm/ wall mount not included; base is shipped attached and must be removed for mounting options)
		VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
		Kensington Lock-ready	Yes
	Certification and Compliance		VESA Video Signal Standard (VSIS) Compliant video cards have been tested and proven compatible for use with the HP Flat Panel Monitor L1925. The HP L1925 has been tested for use with HP Workstations, Compaq Evo PCs and Thin Clients and Compaq D315 Business PCs. **NOTE:** Features are subject to change without notice.
	Service and Warranty		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 at 1-800-HP-INVENT (USA and Canada).
HP Flat Panel Monitor L2035	**Panel**	**Type**	20-inch Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	20.1 in (51 cm)
		Screen Opening (W x H)	16.2 x 12.17 in (41.1 x 30.9 cm)
		Viewing Angle (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
		Brightness (typical*	Up to 250 nits (cd/m^2)
		Contrast Ratio (typical)*	Up to 400:1
		Response Rate (typical)*	16 ms (typical, rise + fall)
		Pixel Pitch	0.255 mm
		Color Depth Support	16.7 million colors
		*All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.	
	On Screen Display (OSD) **Controls**	**Buttons or Switches**	PiP (Picture in Picture), Input select, auto adjust, OSD up, OSD down, OSD menu select, power
		Languages	English, French, German, Spanish, Italian
		User Controls	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
	Signal Interface/ Performance	**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

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	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 ± 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	
	Video Cable Length	5.9 ft (1.8 m)	
Power	**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)	
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	26.9 lb (12.2 kg)
	Tilt Range	-5° to + 25° vertical	
	Swivel Range	-35° to + 35°	
	Height Adjustable	Yes, range 3.54 in (9.0 cm)	
	Pivot Rotation	Yes	
	Base	Attached	
Environmental	**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)	

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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.
Other	**Accessories Included**	VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector
	User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	Warranty Languages	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
	Color	Carbonite/Silver
	VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
	Kensington Lock-Ready	Yes
Certification and Compliance		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) * Energy Star Compliant available summer 2004.
Compatibility		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
Service and Warranty		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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HP Flat Panel Monitor L2335	**Panel**	**Type**	23-inch Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	23 in (58.4 cm)
		Screen Opening (W x H)	19.53 x 12.24 in (49.6 x 31.1 cm)
		Viewing Angle (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
		Brightness (typical)*	Up to 250 nits (cd/m^2)
		Contrast Ratio (typical)*	Up to 500:1
		Response Rate (typical)*	16 ms (typical, rise + fall)
		Pixel Pitch	0.258 mm
		Color Depth Support	16.7 million colors
		* All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.	
	On Screen Display (OSD) **Controls**	**Buttons or Switches**	PiP (Picture in Picture), Input Select, Auto Adjust, OSD Up, OSD Down, OSD Menu Select, Power
		Languages	English, French, German, Spanish, Italian
		User Controls	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
	Signal Interface/ Performance	**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 and DVI input)
		Graphics Controller	Pixelworks PW172
		Native Resolution	1920 x 1200 @ 60 Hz (recommended)
		Preset VESA Graphic Modes (non-interlaced)	1920 x 1200 @ 60Hz
			1600 x 1200 @ 60 Hz, 75 Hz
			1280 x 1024 @ 60 Hz, 75Hz, 85 Hz
			1280 x 960 @ 60 Hz
			1152 x 900 @ 66 Hz
			1024 x 768 @ 60 Hz, 75 Hz, 85 Hz
			800 x 600 @ 60 Hz, 75Hz
			640 x 480 @ 60 Hz, 75 Hz
		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

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Video Input	**Plug and Play**	Yes	
	Input Signal	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	
	Input Impedance	75 ohms ± 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	
	Video Cable Length	5.9 ft (1.8 m)	
Power	**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	< 100 W	
	Power Saving	< 5 W	
	Power Cable Length	5.9 ft (1.8 m)	
Mechanical	**Dimensions** (H x W x D)	**Unpacked**	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)
		Unpacked withou stand (head only)	14.57 x 21.46 x 3.35 in (37.0 x 54.5 x 8.5 cm)
		Packaged	11.5 x 25.75 x 23.86 in (29. 2 x 65.4 x 60.6 cm)
	Weight	**Unpacked**	22.27 lb (10.1 kg)
		Packaged	30.87 lb (14.0 kg)
	Tilt Range	-5° to + 25° vertical	
	Swivel Range	-35° to + 35°	
	Height Adjustable	Yes, range 3.54 in (9.0 cm)	
	Pivot Rotation	Yes	
	Base	Attached	
Environmental	**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.	

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Other	**Accessories Included**	VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector
	User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
	Warranty Languages	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
	Color	Carbonite/silver
	VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
	Kensington Lock-Ready	Yes
Certification and Compliance	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). * Energy Star Compliant available summer 2004.	
Compatibility	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.	
Service and Warranty	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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