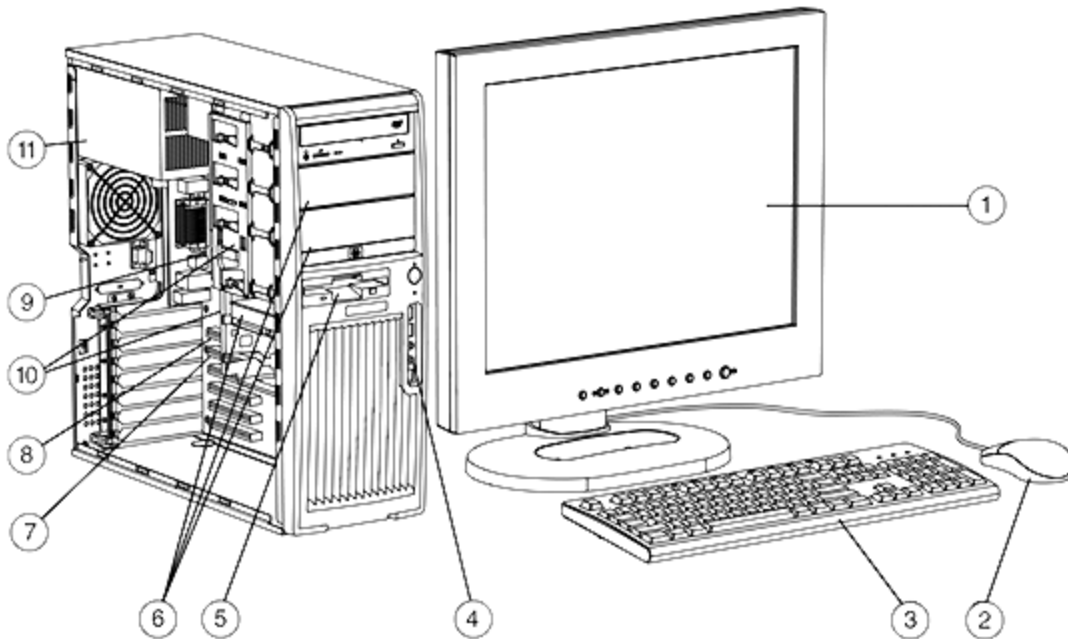


### Overview



1. Monitor (sold separately)
2. 2-Button Scroll Mouse
3. 2004 Standard Keyboard
4. Front IO: 2 USB 2.0, IEEE-1394 (requires optional PCI card to enable), headphone and microphone
5. One 3.5" external bay for optional diskette drive or other 3.5" device
6. Three 5.25" external bays (3rd external is not full depth), and two 3.5" internal bays
7. 4 PCI slots, 2 PCI Express x1 slots
8. 1 PCI Express x16 Graphics slot
9. Rear IO: 6 USB 2.0, 1 standard serial port, 1 optional serial port, 1 parallel port, PS/2 keyboard, PS/2 mouse, RJ-45, audio in, audio out, mic in
10. Intel® Pentium® processor, some with EM64T extensions
11. 400 watt (peak) power supply

### At A Glance

- Operating Systems:
  - Microsoft® Windows® XP Professional,
  - Red Hat Enterprise WS 3,
  - HP Installer Kit for Linux (see <http://www.hp.com/workstations/software/linux/> for details)
- Intel® Pentium® processor with Hyper-Threading Technology
- Support for future Intel® Extended Memory 64 Technology (EM64T) processors
- Intel 925X Express chipset
- Integrated HP Gbit LAN by Broadcom
- 800 MHz processor front side bus
- Convertible and tool-less minitower chassis
- 3 PCI-Express slots/4 PCI slots
- Dual channel DDR-2 memory at 533 MHz
- Four channel SATA Controller with RAID 0 or 1
- SoundMax Digital AC97 integrated audio with internal speaker
- Pre-loaded Manageability tools
- Protected by HP Services, including a 3-3-3 standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.

### Standard Features - Preconfigured Global Models

xw4200X/PD3.20/  
B80/G512/XdF/s

<b>Processor</b>	Intel Pentium 4 at 3.20GHz
<b>OS</b>	Windows XP Professional
<b>Cache Memory</b>	1 MB L2
<b>Memory</b>	512MB (2x256) DDR2-533 ECC
<b>Optical Drive</b>	16X DVD-ROM
<b>Hard Drive</b>	80 GB SATA/150 7200 rpm (1st)
<b>Graphics</b>	Not included in base configuration - Please Choose a graphics card option below: ATI Entry 2D PCI Express (64 MB) NVIDIA Quadro NVS 280 PCI (64 MB, 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) - available September 2004 <b>NOTE:</b> Please see <a href="#">Part Numbers in After market options/Standalone accessories section.</a>
<b>Mouse</b>	HP scroll mouse (PS/2)
<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

#### xw4200X/PD3.20/B80/G512/XdF/s Country Code Key

<b>N. America</b>	PD749AW#ABA	<b>Switzerland</b> (German/French)	PD749AW#AR8
<b>Fr. Canadian</b>	PD749AW#ABC	<b>Switzerland</b> (Italian/English)	PD749AW#ACN
<b>L. America</b>	PD749AW#ABM	<b>Dutch</b>	PD749AW#ABH
<b>Japan</b> (English)	PD749AW#ACF	<b>Denmark</b>	PD749AW#ACE
<b>Japan</b> (Japanese)	PD749AW#ABJ	<b>Asia/Pacific</b> (English)	PD749AW#AB4
<b>UK</b>	PD749AW#ABU	<b>Korea</b>	PD749AW#AB1
<b>Germany</b>	PD749AW#ABD	<b>China</b>	PD749AW#AB2
<b>France</b>	PD749AW#ABF	<b>Taiwan</b>	PD749AW#AB0
<b>Italy</b>	PD749AW#ABZ	<b>India</b>	PD749AW#ACJ
<b>Spain</b>	PD749AW#ABE	<b>Australia</b>	PD749AW#ABG
<b>Europe</b>	PD749AW#AK6	<b>Thailand</b>	PD749AW#AKL

### Standard Features - Preconfigured Global Models

xw4200X/PD3.40/  
B160/G512/XvF/s

<b>Processor</b>	Intel Pentium 4 at 3.40GHz
<b>OS</b>	Windows XP Professional
<b>Cache Memory</b>	1 MB L2
<b>Memory</b>	512MB (2x256) DDR2-533 ECC
<b>Optical Drive</b>	48X DVD-ROM/CDRW Combo
<b>Hard Drive</b>	160 GB SATA/150 7200 rpm (1st)
<b>Graphics</b>	Not included in base configuration - Please Choose a graphics card option below: ATI Entry 2D PCI Express (64 MB) NVIDIA Quadro NVS 280 PCI (64 MB, 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) - available September 2004 <b>NOTE:</b> Please see <a href="#">Part Numbers in After market options/Standalone accessories section.</a>
<b>Mouse</b>	HP scroll mouse (PS/2)
<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

#### xw4200X/PD3.40/B160/G512/XvF/s Country Code Key

<b>N. America</b>	PD750AW#ABA	<b>Switzerland</b> (German/French)	PD750AW#AR8
<b>Fr. Canadian</b>	PD750AW#ABC	<b>Switzerland</b> (Italian/English)	PD750AW#ACN
<b>L. America</b>	PD750AW#ABM	<b>Dutch</b>	PD750AW#ABH
<b>Japan</b> (English)	PD750AW#ACF	<b>Denmark</b>	PD750AW#ACE
<b>Japan</b> (Japanese)	PD750AW#ABJ	<b>Asia/Pacific</b> (English)	PD750AW#AB4
<b>UK</b>	PD750AW#ABU	<b>Korea</b>	PD750AW#AB1
<b>Germany</b>	PD750AW#ABD	<b>China</b>	PD750AW#AB2
<b>France</b>	PD750AW#ABF	<b>Taiwan</b>	PD750AW#AB0
<b>Italy</b>	PD750AW#ABZ	<b>India</b>	PD750AW#ACJ
<b>Spain</b>	PD750AW#ABE	<b>Australia</b>	PD750AW#ABG
<b>Europe</b>	PD750AW#AK6	<b>Thailand</b>	PD750AW#AKL

### Standard Features - Preconfigured Global Models

xw4200X/PD3.40/  
C74/G1.0/XdF/s

<b>Processor</b>	Intel Pentium 4 at 3.40GHz
<b>OS</b>	Windows XP Professional
<b>Cache Memory</b>	1 MB L2
<b>Memory</b>	1 GB (2x512) DDR2-533 ECC
<b>Optical Drive</b>	16X DVD-ROM
<b>Hard Drive</b>	74 GB SATA/150 10,000 rpm (1st)
<b>Graphics</b>	Not included in base configuration - Please Choose a graphics card option below: ATI Entry 2D PCI Express (64 MB) NVIDIA Quadro NVS 280 PCI (64 MB, 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) - available September 2004 <b>NOTE:</b> Please see <a href="#">Part Numbers in After market options/Standalone accessories section.</a>
<b>Mouse</b>	HP scroll mouse (PS/2)
<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

#### xw4200X/PD3.40/C74/G1.0/XdF/s Country Code Key

<b>N. America</b>	PD751AW#ABA	<b>Switzerland</b> (German/French)	PD751AW#AR8
<b>Fr. Canadian</b>	PD751AW#ABC	<b>Switzerland</b> (Italian/English)	PD751AW#ACN
<b>L. America</b>	PD751AW#ABM	<b>Dutch</b>	PD751AW#ABH
<b>Japan</b> (English)	PD751AW#ACF	<b>Denmark</b>	PD751AW#ACE
<b>Japan</b> (Japanese)	PD751AW#ABJ	<b>Asia/Pacific</b> (English)	PD751AW#AB4
<b>UK</b>	PD751AW#ABU	<b>Korea</b>	PD751AW#AB1
<b>Germany</b>	PD751AW#ABD	<b>China</b>	PD751AW#AB2
<b>France</b>	PD751AW#ABF	<b>Taiwan</b>	PD751AW#AB0
<b>Italy</b>	PD751AW#ABZ	<b>India</b>	PD751AW#ACJ
<b>Spain</b>	PD751AW#ABE	<b>Australia</b>	PD751AW#ABG
<b>Europe</b>	PD751AW#AK6	<b>Thailand</b>	PD751AW#AKL

### Standard Features - Preconfigured Global Models

xw4200X/PD3.60/  
B160/G1.0/XvF/s

<b>Processor</b>	Intel Pentium 4 at 3.60GHz
<b>OS</b>	Windows XP Professional
<b>Cache Memory</b>	1 MB L2
<b>Memory</b>	1 GB (2x512) DDR2-533 ECC
<b>Optical Drive</b>	48X DVD-ROM/CDRW Combo
<b>Hard Drive</b>	160 GB SATA/150 7,200 rpm (1st)
<b>Graphics</b>	Not included in base configuration - Please Choose a graphics card option below: ATI Entry 2D PCI Express (64 MB) NVIDIA Quadro NVS 280 PCI (64 MB, 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) - available September 2004 <b>NOTE:</b> Please see <a href="#">Part Numbers in After market options/Standalone accessories section.</a>
<b>Mouse</b>	HP scroll mouse (PS/2)
<b>Other</b>	Includes Floppy Drive and Standard PS/2 Keyboard

#### xw4200X/PD3.60/B160/G1.0/XvF/s Country Code Key

<b>N. America</b>	PD752AW#ABA	<b>Switzerland</b> (German/French)	PD752AW#AR8
<b>Fr. Canadian</b>	PD752AW#ABC	<b>Switzerland</b> (Italian/English)	PD752AW#ACN
<b>L. America</b>	PD752AW#ABM	<b>Dutch</b>	PD752AW#ABH
<b>Japan</b> (English)	PD752AW#ACF	<b>Denmark</b>	PD752AW#ACE
<b>Japan</b> (Japanese)	PD752AW#ABJ	<b>Asia/Pacific</b> (English)	PD752AW#AB4
<b>UK</b>	PD752AW#ABU	<b>Korea</b>	PD752AW#AB1
<b>Germany</b>	PD752AW#ABD	<b>China</b>	PD752AW#AB2
<b>France</b>	PD752AW#ABF	<b>Taiwan</b>	PD752AW#AB0
<b>Italy</b>	PD752AW#ABZ	<b>India</b>	PD752AW#ACJ
<b>Spain</b>	PD752AW#ABE	<b>Australia</b>	PD752AW#ABG
<b>Europe</b>	PD752AW#AK6	<b>Thailand</b>	PD752AW#AKL

### Standard Features - Custom Components

**Processor and Speed –**  
One of the following

**All processors feature Hyper-Threading Technology**

- Intel® Pentium 4 Processor 2.80 GHz, 1 MB/800 MHz FSB
- Intel® Pentium 4 Processor 3.00 GHz, 1 MB/800 MHz FSB
- Intel® Pentium 4 Processor 3.20 GHz, 1 MB/800 MHz FSB
- Intel® Pentium 4 Processor 3.40 GHz, 1 MB/800 MHz FSB with EM64T
- Intel® Pentium 4 Processor 3.60 GHz, 1 MB/800 MHz FSB with EM64T
- Intel® Pentium 4 Processor 3.80 GHz, 1 MB/800 MHz FSB with EM64T

*This workstation will support Pentium 4 processors with Extended Memory 64-bit Technology as they become available from Intel*

**Operating System –**  
One of the following

- Microsoft Windows XP Professional
- Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit available as pre-load, 32 & 64-bit available as an After Market Option)
- HP Installer CD for Red Hat Linux 7.2, 7.3 and WS 3 Box Set (32bit and 64 bit)
- See <http://www.hp.com/workstations/software/linux/>
- Click on "Hardware support matrix" under "Related links" for details.

**1st Hard Disk Drive –**  
One of the following

- 40 GB 7200 rpm Serial ATA drive
- 80 GB 7200 rpm Serial ATA drive
- 160 GB 7200 rpm Serial ATA drive
- 250 GB 7200 rpm Serial ATA drive
- 400 GB 7200 rpm Serial ATA drive (available Fall 2004)
- 36 GB 10K rpm Serial ATA drive
- 74 GB 10K rpm Serial ATA drive
- 73 GB 10K Ultra320 SCSI drive
- 300 GB 10K Ultra320 SCSI drive (available Fall 2004)
- 36 GB 15K Ultra320 SCSI drive
- 73 GB 15K Ultra320 SCSI drive
- 146 GB 15K Ultra320 SCSI drive (available Fall 2004)

**2nd Hard Disk Drive –**  
One of the following

- 2nd hard drive, 40 GB 7200 rpm Serial ATA drive
- 2nd hard drive, 80 GB 7200 rpm Serial ATA drive
- 2nd hard drive, 160 GB 7200 rpm Serial ATA drive
- 2nd hard drive, 250 GB 7200 rpm Serial ATA drive
- 2nd hard drive, 400 GB 7200 rpm Serial ATA drive (available Fall 2004)
- 2nd hard drive, 36 GB 10K rpm Serial ATA drive
- 2nd hard drive, 74 GB 10K rpm Serial ATA drive
- 2nd hard drive, 73 GB 10K Ultra320 SCSI drive
- 2nd hard drive, 300 GB 10K Ultra320 SCSI drive (available Fall 2004)
- 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 (available Fall 2004)

**Drive controllers**

- Integrated4 channel Serial ATA controller with RAID 0, 1 functionality
- Optional SCSI controllers (required with SCSI HDDs)

## Standard Features - Custom Components

<b>Memory –</b> One of the following	256 MB DDR-2 PC2-4300 (533 MHz) ECC (1 x 256 MB)
	512 MB DDR-2 PC2-4300 (533 MHz) ECC (2 x 256 MB)
	1 GB DDR-2 PC2-4300 (533 MHz) ECC (2 x 512 MB)
	1.5 GB DDR-2 PC2-4300 (533 MHz) ECC (2 x 256 MB, 2 x 512 MB)
	2 GB DDR-2 PC2-4300 (533 MHz) ECC (2 x 1 GB)
	2 GB DDR-2 PC2-4300 (533 MHz) ECC (4 x 512 MB)
	3 GB DDR-2 PC2-4300 (533 MHz) ECC (2 x 512 MB, 2 x 1 GB)
	4 GB DDR-2 PC2-4300 (533 MHz) ECC (4 x 1GB)
	128 MB DDR-2 PC2-3200 (400 MHz) non-ECC (1 x 128 MB)
	256 MB DDR-2 PC2-3200 (400 MHz) non-ECC (2 x 128 MB)
	512 MB DDR-2 PC2-3200 (400 MHz) non-ECC (2 x 256 MB)
	1 GB DDR-2 PC2-3200 (400 MHz) non-ECC (4 x 256 MB)

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<b>Removable Storage</b>	1.44-MB Diskette Drive
	48X CD-ROM Drive
	48X/32X/48X CD-RW Drive
	16X/40X DVD-ROM with +R Read
	48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive
	8X 4.7GB DVD+R/RW Drive

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<b>2nd Removable Storage</b>	48X/32X/48X CD-RW Drive
	16X/40X DVD-ROM with +R Read
	48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive
	8X 4.7GB DVD+R/RW Drive

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

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<b>Mouse –</b> One of the following	PS/2 2-Button Scroll Mouse
	PS/2 3-Button Mouse
	USB 2-Button Optical Scroll Mouse
	USB 3-Button Optical Mouse

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<b>Audio</b>	Integrated Digital AC97 audio with internal speaker
	Sound Blaster Audigy 2 ZS PCI sound card

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<b>NIC</b>	Broadcom 5782 10/100/1000 (PCI)
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### Standard Features - Custom Components

#### Graphics

ATI Entry 2D PCI Express (64 MB)  
NVIDIA Quadro NVS 280 PCI (64 MB, 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)

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#### Miscellaneous

Solenoid lock and hood sensor  
IEEE 1394 PCI Card  
Configure minitower in desktop orientation  
Energy Star Settings

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#### Software

Symantec Norton AntiVirus 2004 (optional)\*  
HP Performance Tuning Framework\*  
Altiris Recovery\*  
HP Client Manager Software v6.0\*  
[\\* Not available with Linux Operating System.](#)



### Standard Features - Specs

Form factor	Minitower	
Color	Carbonite/Alloy metallic	
Convertibility	Yes. 5.25" drives rotate for Minitower or Desktop orientation.	
System Board Form Factor	ATX (9.6" x 12")	
Processor	Single Intel Pentium 4 processors and Hyper-Threading Technology (EM64T technology will be supported as processors become available from Intel)	
CPU Bus Speed Supported	800 MHz FSB	
Standard L2 Cache	1 MB L2 cache	
Chipset	Intel 925X Express North bridge/ICH6R South bridge	
Memory Expansion Slots	4 DIMM's	
Memory Type Supported	DDR-2 (ECC and non-ECC)	
Memory Speed Supported	DDR-2 SDRAM PC2-4300 (533 MHz) ECC DDR-2 SDRAM PC2-3200 (400 MHz) non-ECC	
Maximum Memory	4 GB (4 DIMM slots)	
Network controller	Integrated Broadcom 5751 10/100/1000 for HP (PCI Express interface)	
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, full-length) 2 PCI Express (x1) slots 1 PCI Express x16 graphics slot	
AGP slot	None	
Bays	Total Bays = 6	
Internal Bays	<ul style="list-style-type: none"> <li>● Two 3.5 inch SATA Hard Drive</li> </ul>	
External Bays	<ul style="list-style-type: none"> <li>● Two 5.25 inch bays</li> <li>● One 3.5 inch bay for optional floppy drive</li> </ul>	
Parallel Port	1	
Serial Port	1 standard, 2nd is optional	
Front I/O	2 USB 2.0, IEEE-1394 (requires optional PCI card to function), headphone and microphone	
Rear I/O	6 USB 2.0, 1 standard serial port, 1 optional serial port, parallel port, PS/2 keyboard, PS/2 mouse, RJ-45, 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)	17.7 x 6.6 x 17.9 in (45.0 x 16.8 x 45.6 cm) 6.6 x 17.7 x 17.9 in (16.8 x 45.0 x 45.6 cm)	
Weight	Typical configuration – 35 lb	
Shipping weight	Typical configuration – 44 lb	
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	400 watts peak (360 W continuous) Auto-ranging within 230V (115v/230V line switch)	
Interfaces Supported	1 SATA interface (4 Serial-ATA connectors), 1 EIDE interface for optical drives, optional multi-bay interface	
Hard Drive Controller (PCI) Supported	Optional Ultra320 or Ultra320 RAID	

### Standard Features - Specs

<b>Operating System</b> – 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 in Summer 2004 as aftermarket option.
HP Installer Kit for Linux (includes drivers for both 32-bit & 64-bit OS versions)
<b>Preinstalled Software</b>
Microsoft Windows XP Professional*
HP Client Manager Software v6.0*
Altiris Local Recovery*
Alert Standard Format specification*
Norton AntiVirus 2004 (optional preinstall)*
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)
CD/DVD software dependent on optical drive choices
* Not available on Linux

### After-Market Options

Graphics	Multi display solutions	PCI	PCI-Express	
	NVIDIA Quadro NVS 280 (64 MB, VGA & DVI)	X		AA932A
	NVIDIA Quadro NVS 280 (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 PCI-E (128 MB)		X	PB330A
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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
	SCSI Hard Drives			
	36 GB Ultra320 SCSI Hard Drive (10,000 rpm)			AA612A
	73 GB Ultra320 SCSI Hard Drive (10,000 rpm)			AA613A
	146 GB Ultra320 SCSI Hard Drive (10,000 rpm)			AA614A
	300 GB Ultra320 SCSI Hard Drive (10,000 rpm) – available Fall 2004			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) – available Fall 2004			DY671A
	Bracket HDD 3.5" to 5.25"			DY659A
	Cable, 3 port SCSI xw4200/6200			DY661A
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Controllers	SCSI Controllers	PCI	PCI-Express	
	Ultra320 LSI 20320AR	X		DZ554A
	Ultra320 SCSI RAID Adaptec 2120S (Windows only)	X		AA850A
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Removable storage devices				
	256 MB USB 2.0 Drive Key II (Available Fall 2004)			PH657A
	1.44 MB Internal Floppy Drive			DY670A
	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

### After-Market Options

Input/Output Devices	Keyboards	
	HP PS/2 Standard Keyboard	DT527A
	HP USB Standard Keyboard	DT528A
	Pointing Devices	
	HP PS/2 2-Button Scroll Mouse	DD440B
	HP USB 2-Button Optical Scroll Mouse	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)	533 MHz DDR-2 PC2-4300 ECC Unbuffered DIMMs	
	256 MB DDR-2 PC2-4300 (533 MHz) ECC unbuffered	DY653A
	512 MB DDR-2 PC2-4300 (533 MHz) ECC unbuffered	DY654A
	1 GB DDR-2 PC2-4300 (533 MHz) ECC unbuffered	DY652A

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	
	1394 Firewire FH/LP PCI Card (Windows only)	X		PA997A

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 (Roxio software)	DE205A
	Combo Drive	
	48X/32X Combo DVD-ROM/CD-RW Drive (Roxio & WinDVD)	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

### After-Market Options

<b>Security</b>	Chassis clamp lock, universal, no cable	DE817A
	Chassis clamp lock, universal, with cable	DE818A
	Rear Port controller cover	DE896A
<b>Brackets/Stand</b>	Depth Adjustable Rails (stationary)	332558-B21
	Sliding Shelf kit	234672-B21
	Fixed shelf kit	253449-B21
<b>Other Devices</b>	2nd serial port adapter	PA716A
	Front Card Guide and Fan Kit	DY648A
<b>Operating Systems</b>	Red Hat Enterprise Linux Workstation 3 Update 2 (32-bit version)	PD862A
	Red Hat Enterprise Linux Workstation 3 Update 2 (64-bit version)	PD863A
<b>Software</b>	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

## Memory

### Intel 925X Express chipset

#### DDR-2 SDRAM ECC MEMORY

It is not necessary to add memory in pairs. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The Intel 925X chipset supports ECC 533 MHz (PC2-4300) DDR-2 memory or non ECC and ECC 400 MHz (PC2-3200) DDR-2 memory.

For best performance the total amount of memory loaded into Channel A and Channel B should be the same. If it is not, your computer will see all the RAM installed but will run the memory controller at a lower performance mode. For best performance, add the memory in pairs rather than as a single DIMM (two 512 MB DIMMs will have better performance than a single 1 GB DIMM). Also, add the memory into both channels (e.g. one in socket 1 and one in socket 3) to take advantage of dual channel performance. If you have unused slots within a channel, make them socket 2 and socket 4. This provides the best margin for the memory bus. Mixing ECC and non-ECC memory will mean that all memory will run as non-ECC. Mixing speeds will mean that the memory runs at the speed of the slowest DIMM.

#### MAXIMUM MEMORY

Supports up to 4 GB of DDR-2 SDRAM.

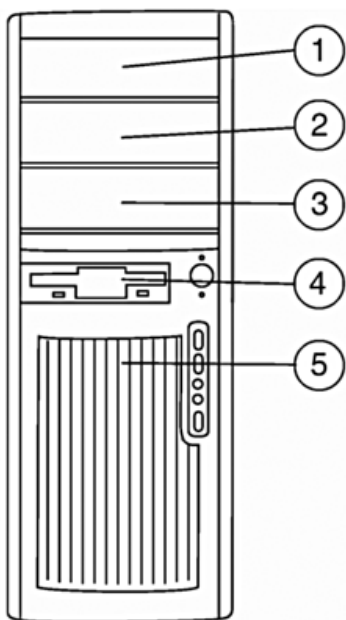
#### POSSIBLE MEMORY CONFIGURATIONS

*Not all memory configurations possible are represented below.*

DIMM Size	Slot			
	1	2	3	4
256 MB	256 MB			
256 MB (single channel performance configuration)	256 MB		256 MB	
1 GB	256 MB	256 MB	256 MB	256 MB
1 GB	512 MB		512 MB	
1.5 GB	256 MB	256 MB	512 MB	512 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

## Storage

Tower configuration



### Convertible Minitower

Optional Diskette Drive

Optical Disk Drives

Hard Disk Drives

**Quantity Supported**

**Position Supported**

**Controller**

Optional Diskette Drive	1	4	Diskette
Optical Disk Drives	2	1, 2	IDE
Hard Disk Drives	2 standard (4 SATA w/AMO) (3 SCSI w/AMO)	5, 6 (and 2 or 3, for 3rd or 4th drives using optical bays, adapter kit(s) required)	SATA (and/or optional SCSI)

### Additional Technical Specifications

<b>System Board</b>	
Architecture	Intel Pentium 4 EM64T/PCI-E
Chipset	Intel 925X Express North bridge/ICH6R South bridge
Super I/O Controller	SMSC LPC47B397
System Board Form Factor	ATX
Processor Socket	LGA775
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 (v1.0a)	1 x 16 2 x 1
Flash ROM	Yes
AC97 integrated audio	Yes
CD ROM IN (Audio)	Yes
AUX IN (Audio)	Yes
Internal speaker	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
Integrated SATA RAID	<ul style="list-style-type: none"> <li>● Multiple Volume support to enable RAID 0 and RAID 1 on a single array</li> <li>● Support for 2 RAID arrays on 4 ports</li> <li>● Creation of 2 HDD array on two SATA ports.</li> <li>● RAID 1 spare and auto-rebuild</li> </ul>
Integrated Broadcom NetXtreme Gigabit ethernet for HP	Yes
Wake-On-Lan®	Yes
ASF 1.0 and 2.0 (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
PCI extender that connects to System Board	None



### Technical Specifications

<b>Cooling</b>	
Chassis Fan	92 mm
Processor Heatsink Fan	70 mm
Power Supply Fan	92 mm

<b>Power Supply</b>			
	Within 230V (115v/230V line switch)		
Full Ranging Input (Line Select Switch)	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	6.4A/6.4A		
Maximum Rated Power	400 W Peak/360 W Continuous		
Heat Dissipation	Typical 737.1 btu/hr Maximum 1228.5 btu/hr		
Power Supply Fan	92mm variable speed		
PS Size	97.6 mm x 150 mm x 153.71 mm		
Energy Star Compliant	Yes		
FEMP Standby Power Compliant (<2W in S5 - Power Off)	No		
Power Consumption in ES Mode - Suspend to RAM (S3) (Instantly Available PC)	2.5 W		
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000V		
Typical configuration power consumption	1 processor (1x 3.4 GHz), 1 GB memory (2x512 MB) Two hard drives (2xSATA 40 GB), CD-ROM drive PCI-Express Graphics Card (FX 1300) Floppy, Monitor		
	<b>Input Power consumption</b>	<b>@ 120Vac/60Hz</b>	
	Typical operating mode (system busy)	216 W	= 737.1 btu/hr
	Windows XP Idle	138 W	= 470.9 btu/hr
	Standby mode (S3)	2.5 W	= 8.53 btu/hr
	Hibernate mode (S4)	2.1 W	= 7.166 btu/hr
	Power Off (S5)	2.1 W	= 7.166 btu/hr

## Technical Specifications

ROM Features	Description
Instantly Available PC (Suspend to RAM – S3)	Allows for very low power consumption with quick resume time
ROM Based F10 Setup	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
Auto Setup when New Hardware Installed	System automatically detects addition of new hardware
Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control	Enable or disables serial, parallel, USB, audio, and network ports
Removable Media Write/Boot Control	Prevents ability to boot from removable media on supported devices (and can disable writes to media)
Power-On Password	Prevents an unauthorized person from booting up the computer
Setup Password	Prevents an unauthorized person from changing the system configuration
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM-based F10 setup
Memory Change Alert (Requires HP Client Manager Software)	Alerts management console if memory is removed or changed
Thermal Alert (Requires HP Client Manager Software)	Monitors the temperature state within the chassis. Three modes: <ul style="list-style-type: none"> <li>● NORMAL – normal temperature ranges</li> <li>● ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown</li> <li>● SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs</li> </ul>
Master Boot Record Security	Detects changes to MBR and optional restoration, useful in protecting from viruses
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
Remote Wakeup	<ul style="list-style-type: none"> <li>● System administrators can power on, restart, and power off a client computer from a remote location.</li> <li>● Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM</li> </ul>
ACPI (Advanced Configuration and Power Management Interface)	<ul style="list-style-type: none"> <li>● Allows the system to wake from a low power mode</li> <li>● Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system</li> </ul> Supports ACPI 2.0 for full compatibility with 64-bit operating systems
SMBIOS	System Management BIOS 2.3.5, previously known as DMI BIOS, for system management information

### Technical Specifications

<b>Other deployment &amp; management features</b>	
HP Client Management Solutions	<p>HP Client Management Solutions help simplify management of Workstations and significantly reduce total ownership costs. These solutions share a common design and are highly integrated due to the extensive work between HP and its partner Altiris.</p> <p>HP Client Manager Software is included free with all HP business PCs and Workstations. It enables central tracking, monitoring, and management of the hardware aspects of HP client systems:</p> <ul style="list-style-type: none"> <li>● Get valuable hardware information such as CPU, memory, video, and security settings</li> <li>● Monitor system health to fix problems before they occur</li> <li>● Install drivers and BIOS updates without visiting each PC</li> <li>● Remotely configure BIOS and security settings</li> <li>● Automate processes to quickly resolve hardware problems</li> </ul> <p>Additional Altiris solutions (fee-based) are available to address Workstation management challenges through the entire IT lifecycle including:</p> <ul style="list-style-type: none"> <li>● Inventory assessment</li> <li>● Software license compliance</li> <li>● Personality migration</li> <li>● Software image deployment</li> <li>● Software distribution</li> <li>● Asset management</li> <li>● Client backup and recovery</li> <li>● Problem resolution</li> </ul> <p>Visit <a href="http://www.hp.com/go/easydeploy">http://www.hp.com/go/easydeploy</a> for more information, to download HP Client Manager Software, and to evaluate the Altiris solutions.</p>
System Software Manager (free)	A free utility that detects and updates BIOS, device drivers, and management agent versions on your networked PCs and workstations
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM-based F10 setup
Software Restore CD	Restores computer to its original factory shipping image
Asset Tag	<ul style="list-style-type: none"> <li>● Repository for storing company-specific property asset numbers for easy tracking</li> <li>● Initially set equal to the system serial number</li> <li>● Stored in a protected section of non-volatile memory that can be accessed and modified with the F10 Setup program</li> </ul>
DIMM Serial Presence Detect	Detects whether or not memory DIMMs are present and their type
Hard drive serial number, model, and manufacturer	Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM-based F10 setup
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
System board revision level	<ul style="list-style-type: none"> <li>● Allows management SW to read revision level of the system board</li> <li>● Revision level is digitally encoded into the HW and cannot be modified</li> </ul>
Memory Change Alert (Requires HP Client Manager Software)	Alerts management console if memory is removed or changed
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen
Ultra ATA Integrity Monitoring (CRC Checking)	<p>A feature of SATA and SCSI, Cyclic Redundancy Checking provides data transfer verification and proactive notification of hard drive data transmission problems with recommendations for enhancing system performance. It detects all the following errors' types:</p> <ul style="list-style-type: none"> <li>● single bit errors</li> <li>● double bit errors</li> <li>● an odd number of errors</li> <li>● error bursts up to 32-bits long</li> </ul>

### Technical Specifications

Drive Self Tests (DPS)	<ul style="list-style-type: none"> <li>● Drive Protection System (Adaptec and LSI SCSI controllers do not offer DPS)</li> <li>● A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user.</li> <li>● Running independently of the operating system, it can be accessed through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced.</li> </ul> <p>The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures DPS Access through F10 Setup during Boot (F10 diagnostic access not available with SCSI drives)</p>
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	<p>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.</p> <p>SMART I – Drive Failure Prediction SMART II – Off-Line Data Collection SMART III – Off-Line Read Scanning with Defect Reallocation</p>

<b>Security Features</b>	
Padlock support	Padlock loop in rear of chassis. Locks side cover and secures chassis from theft. (0.22" diameter)
Cable Lock Support	Kensington lock slot in rear of chassis. Locks side cover and secures chassis from theft. (3mm x 7mm opening)
Universal chassis clamp lock support	Threaded feature in rear of chassis. Locks side cover and locks cables to chassis. Secures chassis from theft and allows multiple units to be chained together when used with optional cable.
Solenoid lock and hood sensor	Yes
Rear port control cover (optional)	Locks rear IO cables to prevent cable theft.
Serial, Parallel, USB Enable/Disable	Enable or disable serial, parallel or USB ports and hide them from the operating system
Removable Media Write/Boot Control	Prevents the computer from being booted 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

<b>System Software Updating</b>	
Product Change Notification	<ul style="list-style-type: none"> <li>● Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile.</li> <li>● PCNs provide advance notification of hardware and software changes to be implemented in the factory providing time to plan for transition.</li> <li>● Customer Advisories provide concise, effective problem resolution, greatly reducing the need to call technical support.</li> </ul>
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
Remote Wakeup/Remote Shutdown	<ul style="list-style-type: none"> <li>● System administrators can power on, restart, and power off a client computer from a remote location.</li> <li>● Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.</li> </ul>
ROM Based Setup (F10) and Start-up Diagnostics	Yes
Support Software CD & WWW	Yes

<b>Other Features</b>	
ACPI-Ready Hardware	<p>Advanced Configuration and Power Management Interface (ACPI).</p> <ul style="list-style-type: none"> <li>● Allows the system to wake from a low power mode.</li> <li>● Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system</li> </ul>

## Technical Specifications

Serviceability Features of System	
Access panel	Tool-less, one-handed
Optical drives	Tool-less
Floppy drive	Tool-less
Hard drives	Tool-less
Expansion cards	Tool-less
Green user touch points	Yes, on tool-free internal chassis mechanisms
Color-coordinated cables and connectors	Yes
Memory	Tool-less, can be upgraded without removing any internal components
System board	Tool-less removal
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

### Technical Specifications

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

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

### Technical Specifications - Communications

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



### Technical Specifications - Communications

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

## Technical Specifications - Controllers

<b>LSI Logic LSI20320 Ultra320 SCSI single channel host adapter</b>	<b>Bus architecture</b>	PCI-X (backward compatible with PCI)
	<b>Number of supported devices</b>	Up to 15 SCSI devices
	<b>Interface protocol</b>	64 bit, 133MHz PCI-X
	<b>Host bus transfer rate</b>	Up to 1MB/s
	<b>SCSI data transfer rate</b>	Up to 320MB/s per channel
	<b>SCSI Bus</b>	Wide Ultra320, Low Voltage Differential, and Ultra Wide Single-Ended
	<b>Internal connector</b>	68-pin HD
	<b>External connector</b>	68 pin VHDCI
	<b>Total connectors</b>	2
	<b>Plug and Play Support</b>	No
	<b>Dimensions (H x L)</b>	6.6 x 2.5 in (16.9 x 6.4 cm)
	<b>Approvals</b>	CE, VCCI, Canada, C-Tick, FCC class B, UL 94VO
	<b>Operating system support</b>	Microsoft® Windows® XP
	<b>Kit contents</b>	Adaptec 39320D Ultra320 Dual Channel controller; operating system drivers; five-position, 68-pin LVD internal cable with terminator; three-position, 50-pin internal cable, user documentation, warranty card

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

### Technical Specifications - Hard Drives

#### 7200 rpm Serial ATA Hard Drives 40GB

<b>Capacity</b>	40020664320 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s	
<b>Buffer</b>	2 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
	<b>Average</b>	8.5 ms
	<b>Full-Stroke</b>	18.0 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	78,165,360	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

#### 80GB

<b>Capacity</b>	80026361856 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s	
<b>Buffer</b>	8 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
	<b>Average</b>	8.5 ms
	<b>Full-Stroke</b>	18 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	156,301,488	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

#### 160GB

<b>Capacity</b>	160041885696 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	150 MB/s	
<b>Buffer</b>	8 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
	<b>Average</b>	8.5 ms
	<b>Full-Stroke</b>	18 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	312,581,808	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

### Technical Specifications - Hard Drives

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

### Technical Specifications - Hard Drives

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

<b>Capacity</b>	73,407,865,860 bytes	
<b>Height</b>	1.0 in (2.54 cm)	
<b>Width</b>	3.5 in (8.9 cm)	
<b>Interface</b>	68 pin LVD SCSI	
<b>Synchronous Transfer Rate (Maximum)</b>	320 MB/s	
<b>Buffer</b>	8 Mbytes	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	.3 msec
	<b>Average</b>	<4.5 msec
	<b>Full-Stroke</b>	<11.0 msec
<b>Rotational Speed</b>	10,000 rpm	
<b>Logical Blocks</b>	143,374,738	
<b>Operating Temperature</b>	40° F to 130° F (5° C to 55° C)	

**Ultra320 SCSI Hard Drives 36GB**  
(15,000 rpm)

<b>Capacity</b>	36,420,075,520 bytes	
<b>Height</b>	1.0 in (2.54 cm)	
<b>Width</b>	3.5 in (8.9 cm)	
<b>Interface</b>	68 pin LVD SCSI	
<b>Synchronous Transfer Rate (Maximum)</b>	320 MB/s	
<b>Buffer</b>	8 Mbytes	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	.3 msec
	<b>Average</b>	<3.5 msec
	<b>Full-Stroke</b>	<9.0 msec
<b>Rotational Speed</b>	15,000 rpm	
<b>Logical Blocks</b>	71,132,960	
<b>Operating Temperature</b>	40° F to 130° F (5° C to 55° C)	

**73GB**

<b>Capacity</b>	73,407,865,856 bytes	
<b>Height</b>	1.0 in (2.54 cm)	
<b>Width</b>	3.5 in (8.9 cm)	
<b>Interface</b>	68 pin LVD SCSI	
<b>Synchronous Transfer Rate (Maximum)</b>	320 MB/s	
<b>Buffer</b>	8 Mbytes	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	.3 msec
	<b>Average</b>	<3.5 msec
	<b>Full-Stroke</b>	<9.0 msec
<b>Rotational Speed</b>	15,000 rpm	
<b>Logical Blocks</b>	143,374,738	
<b>Operating Temperature</b>	40° F to 130° F (5° C to 55° C)	

### *Technical Specifications - Removable Storage*

<b>USB Disk on Key</b> (Available Fall 2004)	<b>Dimensions (HxWxD)</b>	0.9 x 0.7 x 3.9 in (2.3 x 1.8 x 9.8 cm)
	<b>Weight</b>	0.05 lb (0.02 kg)
	<b>USB Specification</b>	1.1 and 2.0
	<b>Transfer Rate</b>	Read-1023 KB/Sec; Write-850 KB/Sec
	<b>Storage Media</b>	Solid state flash memory, no moving parts
	<b>Power Supply</b>	USB Bus-powered, no external power required
	<b>Capacity</b>	256 MB

### Technical Specifications - Input/Output Devices

<b>PS/2 OR USB '04 Standard Keyboard</b>	<b>Physical characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)
		<b>Dimensions (L x W x H)</b>	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
	<b>Electrical</b>	<b>Weight</b>	2 lb (0.9 kg) minimum
		<b>Operating voltage</b>	+ 5VDC ± 5%
		<b>Power consumption</b>	50-mA maximum (with three LEDs ON)
		<b>ESD</b>	CE level 4, 15-kV air discharge
		<b>EMI - RFI</b>	Conforms to FCC rules for a Class B computing device
	<b>Mechanical</b>	<b>Microsoft® PC 99 - 2001</b>	Functionally compliant
		<b>Languages</b>	38 available
		<b>Keycaps</b>	Low-profile design
		<b>Switch actuation</b>	55-g nominal peak force with tactile feedback
		<b>Switch life</b>	20 million keystrokes (using Hasco modified tester)
		<b>Switch type</b>	Contamination-resistant switch membrane
		<b>Key-leveling mechanisms</b>	For all double-wide and greater-length keys
		<b>Cable length</b>	6 ft (1.8 m)
		<b>Microsoft PC 99 - 2001</b>	Mechanically compliant
	<b>Environmental</b>	<b>Acoustics</b>	43-dBA maximum sound pressure level
		<b>Operating temperature</b>	50° to 122° F (10° to 50° C)
		<b>Non-operating temperature</b>	-22° to 140° F (-30° to 60° C)
		<b>Operating humidity</b>	10% to 90% (non-condensing at ambient)
		<b>Non-operating humidity</b>	20% to 80% (non-condensing at ambient)
		<b>Operating shock</b>	40 g, six surfaces
		<b>Non-operating shock</b>	80 g, six surfaces
		<b>Operating vibration</b>	2-g peak acceleration
		<b>Non-operating vibration</b>	4-g peak acceleration
		<b>Drop (out of box)</b>	26 in (66 cm) on carpet, six-drop sequence
		<b>Drop (in box)</b>	42 in (107 cm) on concrete, 16-drop sequence
	<b>Operating system support</b>	Windows® 2000 and Windows XP	
	<b>Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	
	<b>Kit contents</b>	Keyboard, keyboard software media, installation guide, warranty card, safety and comfort	

### Technical Specifications - Input/Output Devices

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

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

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



### Technical Specifications - Input/Output Devices

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

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

### Technical Specifications - Input/Output Devices

<b>1394 Firewire FH/LP Card (PCI)</b>	<b>Device Interface Protocol</b>	IEEE-1394a	
	<b>Data Rate</b>	100Mbps/s, 200Mbit/s and 400Mbps/s	
	<b>Devices Supported</b>	IEEE-1394 compliant devices	
	<b>Connectors</b>	Two IEEE1394 6-Pin Connector (Bracket Side) One 10-Pin (9 Contacts) Custom Connector (Internal)	
	<b>Bus Interface</b>	PCI	
	<b>Physical</b>	Low profile PCI card with a full height bracket	
	<b>Environmental</b>	<b>Operating temperature</b>	32° to 104° F (0° to 50° C)
		<b>Non-operating temperature</b>	-13° to 158° F (-25° to 70° C)
		<b>Relative humidity</b>	5% to 95%
		<b>Ports</b>	3 cable ports
	<b>Minimum System Requirements</b>	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			
<b>Regulatory Agency Approval</b>	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwan BSMI CNS13438, Korea MIC		

### Technical Specifications - Optical Devices

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

### Technical Specifications - Optical Devices

<b>16X/40X DVD-ROM Drive with +R Read Support</b>	<b>Height</b>	5.25-in, half-height, tray load	
	<b>Interface Type</b>	ATAPI/EIDE	
	<b>Dimensions (W x H x D)</b>	5.88 x 1.71 x 7.87 [max] in (149.5 x 43.25 x 200.0 [max] mm) (external, excluding bezel)	
	<b>Disc Formats</b>	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW	
	<b>Disc Capacity</b>	<b>DVD-ROM</b>	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R)
		<b>CD-ROM</b>	540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)
	<b>Access Times</b> (typical reads, including settling)	<b>DVD-ROM Single Layer</b>	120 ms
		<b>CD-ROM Mode 1</b>	90 ms
		<b>Full Stroke DVD</b>	240 ms (seek)
		<b>Full Stroke CD</b>	160 ms (seek)
		<b>Startup Time</b>	< 10 seconds (typical)
		<b>Stop Time</b>	< 4 seconds
		<b>Data Transfer Modes</b>	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)
	<b>Maximum Data Transfer Rates</b>	<b>CD-ROM Read</b>	6000 KB/s (40X) Max
		<b>DVD-ROM Read</b>	21,600 KB/s (16X) Max
		<b>Digital Audio Extraction</b>	6000 KB/s (40X) Max
	<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
		<b>DC Power Requirement</b>	5 VDC $\pm$ 5% – 100 mV ripple p-p 12 VDC $\pm$ 5% – 200 mV ripple p-p
		<b>DC Current</b>	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical, <1800 mA maximum
	<b>Audio Output</b>	<b>Line-Out</b>	0.7 VRMS
		<b>Signal-to-Noise Ratio</b>	85 dB
		<b>Channel Separation</b>	65 dB
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes		
<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon		
<b>Operating Environmental</b> (all conditions non-condensing)	<b>Temperature</b> (operating)	41° to 122° F (5° to 50° C)	
	<b>Relative Humidity</b> (operating)	10% to 85%	
	<b>Maximum Wet Bulb Temperature</b> (operating)	86° F (30° C)	
<b>Certifications, Approvals</b>	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992		
<b>Operating Systems Supported</b>	Microsoft Windows 2000, Windows XP Professional		
<b>Kit Contents</b>	16X/40X DVD-ROM Drive, InterVideo WinDVD MPEG Movie Playback software, audio cable, and installation guide.		



### Technical Specifications - Optical Devices

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

### Technical Specifications - Optical Devices

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

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

### Technical Specifications - Optical Devices

<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC Power Requirement</b>	5 VDC $\pm$ 5%-100 mV ripple p-p 12 VDC $\pm$ 5%-200 mV ripple p-p
	<b>DC Current</b>	5 VDC (< 1000 mA typical, < 1600 mA maximum) 12 VDC (< 600 mA typical, < 1400 mA maximum)
	<b>Total Drive Power</b> (standby mode)	< 2.5 Watt
<b>Audio Output</b>	<b>Line-Out</b>	0.7 VRMS
	<b>Signal-to-Noise Ratio</b>	74 dB
	<b>Channel Separation</b>	65 dB
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes	
<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon	
<b>Operating Environmental</b> (all conditions non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative humidity</b>	10% to 90%
	<b>Maximum wet bulb temperature</b>	86° F (30° C)
<b>Certifications, Requirements</b>	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec SFF-8020, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft® PC2001 certification, Microsoft Logo for Windows® XP and 2000.	
<b>Operating Systems Supported</b>	Microsoft Windows 2000, Windows XP Professional	
<b>Option Kit Contents</b>	48X Combo CD-RW/DVD-ROM Drive, Roxio Easy CD & DVD Creator, InterVideo WinDVD MPEG Movie Playback software, Dantz Retrospect Express Backup software, audio cable, and installation guide.	

#### 8X DVD+R/+RW

<b>Height</b>	5.25-inch, half-height, tray-load	
<b>Orientation</b>	Either horizontal or vertical	
<b>Interface Type</b>	ATAPI/EIDE	
<b>Disc Recording Capacity</b>	4.7 GB	
<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
<b>Weight (max)</b>	2.6 lb (1.2 kg)	
<b>Recording Method</b>	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet	
<b>Write Support</b>	DVD+R, DVD+RW, CD-R, CD-RW	
<b>Read Support</b>	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	
<b>Write Speed (max)</b>	<b>DVD+R</b>	8X CLV (10800 KB/s)
	<b>DVD+RW</b>	4X CLV (5400 KB/s)
	<b>CD-R</b>	24X CLV (3600 KB/s)
	<b>CD-RW</b>	10X CLV (1500 KB/s)
<b>Read Speed (max)</b>	<b>DVD-ROM</b>	12X CAV (6750 to 16200 KB/s)
	<b>DVD+R, DVD+RW,</b>	8X CAV (5400 to 10800 KB/s)
	<b>CD-ROM, CD-R, CD-RW, CD-Audio</b>	40X CAV (2550 to 6000 KB/s)



### Technical Specifications - Optical Devices

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

### Technical Specifications - Graphics

<b>NVIDIA Quadro 280 NVS (PCI)</b>	<b>Form Factor</b>	ATX
	<b>Graphic Controller</b>	Integrated Quadro 280 2-D graphics processor unit (GPU)
	<b>VGA controller</b>	Integrated into the Quadro GPU
	<b>Bus type</b>	PCI
	<b>RAMDAC</b>	Dual 350 MHz
	<b>Memory</b>	64 MB DDR with frame buffer and Texture storage
	<b>Connector</b>	Single High-density Flex Connector
	<b>Dimensions</b>	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	<b>Controller clock speed</b>	275 MHz
	<b>Color planes</b>	32-bit color buffer
	<b>Overlay planes</b>	1 16-bit Video overlay plane
	<b>Maximum vertical refresh rate</b>	120 Hz
	<b>Maximum pixel clock</b>	350 MHz
	<b>Multi-monitor support</b>	Dual analog or digital monitors
	<b>Single DVI Support</b>	Yes
	<b>Dual DVI Support</b>	Yes
	<b>High-definition Video Processor (HDVP)</b>	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	<b>Available graphics drivers</b>	Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode) Red Hat Linux HP qualified drivers may be preloaded or available from the HP support web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a>
	<b>Maximum resolution</b>	2048 x 1536 analog 1600 x 1200 digital

### Technical Specifications - Graphics

<p><b>NVIDIA Quadro NVS 280 Graphics Card</b> (PCI-Express)</p>	<p><b>Form Factor</b></p> <p><b>Graphics Controller</b></p> <p><b>VGA controller</b></p> <p><b>Bus Type</b></p> <p><b>RAMDAC</b></p> <p><b>Memory</b></p> <p><b>Connectors</b></p> <p><b>Multi-monitor support</b></p> <p><b>Additional product features</b></p> <p><b>PCI-Express</b></p> <p><b>Available graphics drivers</b></p> <p><b>Maximum resolution</b></p>	<p>ATX</p> <p>Integrated Quadro 280 2-D graphics processor unit (GPU)</p> <p>Integrated into the Quadro GPU</p> <p>PCI-Express x16 or PCI</p> <p>Dual 350 MHz integrated</p> <p>64 MB 000 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage</p> <p>Single High-density Flex Connector</p> <p>Dual integrated analog display controllers supporting up to two analog displays at 1920 x1200 @ 85Hz or two digital displays at 1600x1200 @ 60Hz</p> <p><b>Controller clock speed</b> 250 MHz</p> <p><b>Color planes</b> 32-bit color buffer</p> <p><b>Overlay planes</b> 1 16-bit Video overlay plane</p> <p><b>Maximum vertical refresh rate</b> 120 Hz</p> <p><b>Maximum pixel clock</b> 350 MHz</p> <p><b>Single DVI Support</b> Yes</p> <p><b>Dual DVI Support</b> Yes</p> <p><b>High-definition Video Processor</b> (HDVP)</p> <p>Full-screen, full-frame video playback of HDTV and DVD content</p> <p>DVD-ready motion compensation for MPEG-2</p> <p>Independent hardware color controls for video overlay</p> <p>Hardware color-space conversion (YUV 4:2:2 and 4:2:0)</p> <p>IDCT motion compensation</p> <p>5-tap horizontal by 3-tap vertical filtering</p> <p>8:1 up/down scaling</p> <p>Supports X16 PCI-E</p> <p>Microsoft Windows® XP or Windows 2000 (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode)</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/eng/software_drivers.html">http://welcome.hp.com/country/us/eng/software_drivers.html</a>.</p> <p>2048 x 1536 analog</p> <p>1600 x 1200 digital</p>
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### Technical Specifications - Graphics

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

### Technical Specifications - Graphics

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

### Technical Specifications - Graphics

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

### Technical Specifications - Graphics

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

### Technical Specifications - Monitors

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



### Technical Specifications - Monitors

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

### Technical Specifications - Monitors

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

### Technical Specifications - Monitors

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

### Technical Specifications - Monitors

	<b>Color</b>	Carbon/Silver
	<b>VESA Mounting</b>	Yes (swing arm/ wall mount not included; base is shipped attached and must be removed for mounting options)
	<b>VESA External Mounting</b>	Yes (Standard 4 hole pattern, 100 mm)
	<b>Kensington Lock-ready</b>	Yes
<b>Certification and Compliance</b>		VESA Video Signal Standard (VSIS) Compliant video cards have been tested and proven compatible for use with the HP Flat Panel Monitor L1925. <b>NOTE:</b> Features are subject to change without notice.
<b>Service and Warranty</b>		Limited three-year parts and repair labor, service provider labor, and on-site service. Next Business Day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply. For details, contact HP Customer Support at 1-800-HP-INVENT (USA and Canada).

<b>HP Flat Panel Monitor L2035</b>	<b>Panel</b>	<b>Type</b>	20-inch Active Matrix TFT (thin film transistor)
		<b>Viewable Image Area</b> (diagonal)	20.1 in (51 cm)
		<b>Screen Opening</b> (W x H)	16.2 x 12.17 in (41.1 x 30.9 cm)
		<b>Viewing Angle</b> (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
		<b>Brightness</b> (typical)*	Up to 250 nits (cd/m <sup>2</sup> )
		<b>Contrast Ratio</b> (typical)*	Up to 400:1
		<b>Response Rate</b> (typical)*	16 ms (typical, rise + fall)
		<b>Pixel Pitch</b>	0.255 mm
		<b>Color Depth Support</b>	16.7 million colors
	<b>On Screen Display (OSD) Controls</b>	<b>Buttons or Switches</b>	PiP (Picture in Picture), Input select, auto adjust, OSD up, OSD down, OSD menu select, power
		<b>Languages</b>	English, French, German, Spanish, Italian
		<b>User Controls</b>	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
	<b>Signal Interface/ Performance</b>	<b>Horizontal Frequency</b>	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
		<b>Vertical Frequency</b>	48 to 85 Hz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
		<b>Graphics Controller</b>	Pixelworks PW171
		<b>Native Resolution</b>	1600 x 1200 @ 60 Hz (recommended)
		<b>Preset VESA Graphic Modes</b> (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
		<b>Text Mode</b>	720 x 400 @ 70 Hz

### Technical Specifications - Monitors

	<b>Mac Mode</b>	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
	<b>Sun Mode</b>	1152 x 900 @ 66 Hz
	<b>Maximum Pixel Clock Speed</b>	202 MHz (VGA input); 162 MHz (DVI input)
	<b>User Programmable Modes</b>	Yes, 10
	<b>Anti-Glare</b>	Yes
	<b>Anti-Static</b>	Yes
	<b>Default Color Temperature</b>	6500 K
<b>Video Input</b>	<b>Plug and Play</b>	Yes
	<b>Input Signal</b>	Four connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, and one s-video
	<b>Input Impedance</b>	75 ohms $\pm$ 10%
	<b>Sync Input</b>	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green
	<b>Video Cable</b>	VGA to VGA; VGA to DVI-I; DVI-D to DVI-I
	<b>Video Cable Length</b>	5.9 ft (1.8 m)
<b>Power</b>	<b>Input Power</b>	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz
	<b>Frequency</b>	47.5 to 63 Hz
	<b>Maximum</b>	< 75 W
	<b>Power Saving</b>	< 5 W
	<b>Power Cable Length</b>	5.9 ft (1.8 m)
<b>Mechanical</b>	<b>Dimensions (H x W x D)</b>	<p><b>Unpacked with stand</b> 17.36 to 20.9 x 17.8 x 8.27 in (44.1 to 53.1 x 45.2 x 21.0 cm)</p> <p><b>Unpacked without stand (head only)</b> 14.29 x 17.8 x 3.19 in (36.3 x 45.2 x 8.1 cm)</p> <p><b>Packaged</b> 11.5 x 21.9 x 23.9 in (29.2 x 55.6 x 60.6 cm)</p>
	<b>Weight</b>	<p><b>Unpacked</b> With stand: 20.28 lb (9.2 kg); Without stand: 12.35 lb (5.6 kg)</p> <p><b>Packaged</b> 26.9 lb (12.2 kg)</p>
	<b>Tilt Range</b>	-5° to + 25° vertical
	<b>Swivel Range</b>	-35° to + 35°
	<b>Height Adjustable</b>	Yes, range 3.54 in (9.0 cm)
	<b>Pivot Rotation</b>	Yes
	<b>Base</b>	Attached
<b>Environmental</b>	<b>Temperature – Operating</b>	46° to 95° F (10° to 35° C)
	<b>Temperature – Non-operating</b>	6° to 140° F (-10° to 60° C)
	<b>Humidity – Operating</b>	20% to 80% non-condensing
	<b>Humidity – Non-operating</b>	5% to 85%
	<b>Altitude – Operating</b>	+12,000 ft
	<b>Altitude – Non-operating</b>	+40,000 ft

### Technical Specifications - Monitors

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

### Technical Specifications - Monitors

<b>HP Flat Panel Monitor L2335</b>	<b>Panel</b>	<b>Type</b> <b>Viewable Image Area</b> (diagonal) <b>Screen Opening</b> (W x H) <b>Viewing Angle</b> (typical)* <b>Brightness</b> (typical)* <b>Contrast Ratio</b> (typical)* <b>Response Rate</b> (typical)* <b>Pixel Pitch</b> <b>Color Depth Support</b>	23-inch Active Matrix TFT (thin film transistor) 23 in (58.4 cm) 19.53 x 12.24 in (49.6 x 31.1 cm) Up to 170° H/170° V (10:1 minimum contrast ratio) Up to 250 nits (cd/m <sup>2</sup> ) Up to 500:1 16 ms (typical, rise + fall) 0.258 mm 16.7 million colors
	<b>On Screen Display (OSD) Controls</b>	<b>Buttons or Switches</b>  <b>Languages</b>  <b>User Controls</b>	* 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.  PiP (Picture in Picture), Input Select, Auto Adjust, OSD Up, OSD Down, OSD Menu Select, Power  English, French, German, Spanish, Italian  Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
	<b>Signal Interface/ Performance</b>	<b>Horizontal Frequency</b>  <b>Vertical Frequency</b> <b>Graphics Controller</b> <b>Native Resolution</b> <b>Preset VESA Graphic Modes</b> (non-interlaced)  <b>Text Mode</b> <b>Mac Mode</b> <b>Sun Mode</b> <b>Maximum Pixel Clock Speed</b> <b>User Programmable Modes</b> <b>Anti-Glare</b> <b>Anti-Static</b> <b>Default Color Temperature</b>	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)  48 to 85 Hz (VGA and DVI input) Pixelworks PW172 1920 x 1200 @ 60 Hz (recommended) 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  720 x 400 @ 70 Hz 1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz 1152 x 900 @ 66 Hz 202 MHz (VGA input); 162 MHz (DVI input)  Yes, 10  Yes Yes 6500 K

### Technical Specifications - Monitors

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



### Technical Specifications - Monitors

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

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