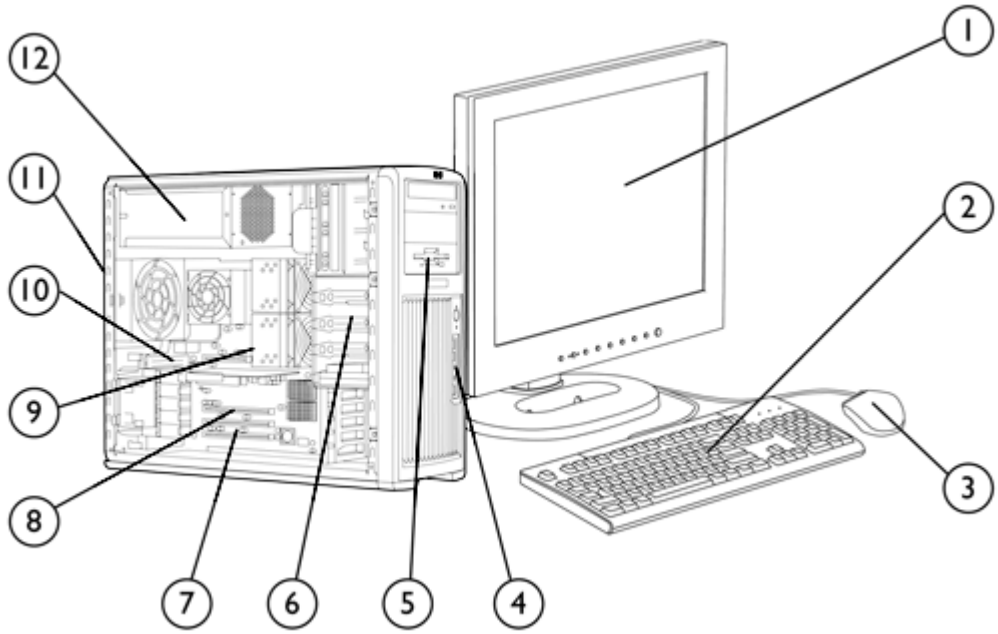
Overview

HP recommends Windows Vista® Business



1. Monitor (sold separately)
2. Standard Keyboard (USB or PS/2)
3. Mouse (USB or PS/2)
4. Front IO: 2 USB 2.0, IEEE-1394a (standard), headphone and microphone
5. 5.25" external bay for optional diskette drive, optical drive or other 5.25"/3.5" device
6. 5 internal 3.5" bays, 3 external 5.25" bays
7. 1 PCI slot, 1 PCI-X slot, 1 PCIe x1 or x8 (selectable), 2 PCIe x8 (x4 electrically)
8. 2 PCI Express x16 Gen2 Graphics Bus
9. Dual-Core or Quad-Core Intel® Xeon® Processors
10. 8 DIMM slots (16 with riser) for DDR2 FB-DIMM memory
11. 5 USB 2.0, 1 standard serial port, 2 PS/2, 2 RJ-45, audio line in, audio line out, and microphone in, microphone, 1 IEEE-1394a
12. Choice of 800 or 1050 watt, 80 PLUS power supplies

Form Factor	Minitower
Compatible Operating Systems	Genuine Windows Vista® 32-bit downgrade to Genuine Microsoft® Windows® XP Professional 32-bit Genuine Windows Vista® 64-bit downgrade to Genuine Microsoft® Windows® XP Professional 64-bit Genuine Windows Vista® Business 32-bit Genuine Windows Vista® Business 64-bit HP Installer Kit for Linux (includes drivers for both 32-bit and 64-bit OS versions of Red Hat Enterprise Linux® WS4 and WS5 For detailed OS/hardware support information for Linux, see: http://www.hp.com/support/linux_hardware_matrix
Available Processors	Quad-Core Intel Xeon Processor with Intel® 64 Architecture • Quad-Core Intel® Xeon® Processor E5405/ 2.00 GHz,1333 MHz FSB, 80 watt • Quad-Core Intel® Xeon® Processor E5410/ 2.33 GHz,1333 MHz FSB, 80 watt • Quad-Core Intel® Xeon® Processor E5420/ 2.50 GHz,1333 MHz FSB, 80 watt

	• Quad-Core Intel® Xeon® Processor E5430/ 2.66 GHz,1333 MHz FSB, 80 watt • Quad-Core Intel® Xeon® Processor E5440/ 2.83 GHz,1333 MHz FSB, 80 watt • Quad-Core Intel® Xeon® Processor X5450/ 3.00 GHz,1333 MHz FSB, 120 watt • Quad-Core Intel® Xeon® Processor X5460/ 3.16 GHz,1333 MHz FSB, 120 watt • Quad-Core Intel® Xeon® Processor X5470/ 3.33 GHz,1333 MHz FSB, 120 watt • Quad-Core Intel® Xeon® Processor X5472/ 3.00 GHz,1600 MHz FSB, 120 watt • Quad-Core Intel® Xeon® Processor X5482/ 3.20 GHz,1600 MHz FSB, 150 watt • Quad-Core Intel® Xeon® Processor X5492/ 3.40 GHz,1600 MHz FSB, 150 watt Dual-Core Intel Xeon Processors with Intel® 64 Architecture One or two Dual-Core Intel Xeon Processor 5200 Sequence (Note 1) • Intel Xeon E5205/ 1.86 GHz, 6 MB L2, 1066 MHz FSB, 65 watt • Intel Xeon E5240/ 3.00 GHz, 6 MB L2, 1066 MHz FSB, 65 watt • Intel Xeon X5260/ 3.33 GHz, 6 MB L2, 1333 MHz FSB, 80 watt • Intel Xeon X5270/ 3.5 GHz, 6 MB L2, 1333 MHz FSB, 80 watt • Intel Xeon X5272/ 3.40 GHz, 6 MB L2, 1600 MHz FSB, 80 watt
Available Processor Disclaimers	Note 1: When ordering two processors, the second processor must be the same as the first. Intel's numbering is not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families. See: http://www.intel.com/products/processor_number/ for details. 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. See: http://www.intel.com/info/em64t for more information. Quad-Core and Dual-Core are designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefits; check with software provider to determine suitability. Not all customers or software applications will necessarily benefit from use of these technologies.
Additional Details	• 64-Bit Quad-Core Intel® Xeon® Processor 5400 Sequence (12 MB L2 cache) or Dual-Core Intel® Xeon® Processor 5200 Sequence (6 MB L2 cache) • Up to 1600 MHz Front Side Bus support • 4-channel 667/800 MHz FB-DIMM memory subsystem • Up to 128 GB memory capacity • PCI Express I/O and PCIe x16 Gen2 graphics • Dual integrated Broadcom 5755 Gigabit LAN on Motherboard (LoM) • 6 channels of Serial ATA (SATA) and 8 channels of Serial Attached SCSI (SAS) 3.0 Gb/s natively supported internally; SATA RAID level 0, 1, 5 and 10 and SAS RAID level 0, 1, 10 available on motherboard* • SATA optical drives • High Definition integrated audio with internal speaker • Choice of 800 or 1050 watt 80 PLUS power supply • ENERGY STAR 4.0 compliance with energy-saving features available on selected configurations (Not supported by Linux) • Protected by HP Services, including a 3 years parts, 3 years labor, and 3 years onsite service (3/3/3) standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.
Color	Carbonite/Alloy metallic

Overview

I/O Slots (see system board section for more details)	• 1 PCI 32bit/33MHz slot. (half-length, full-height) • 2 PCI Express Gen2 x16 slots (full-length, full-height) • 2 PCI Express x4 slots - with x8 connectors (full-length, full-height) • 1 PCI Express x8/x1 switchable. (full-length, full-height) • 1 PCI-X 133MHz slot. (full-length, full-height) • The PCIe x8 connectors are open-ended, alowing a PCIe x16 card to be seated in the slot.	
Bays (see storage section for more details)	• Total Bays = 8	
Internal Bays	5 internal 3.5" bays (4 with acoustic dampening rail assemblies)	
External Bays	3 external 5.25" bays* *Third external 5.25" bay is not full-depth, bottom bay is limited to 200mm device depth.	
Front I/O	2 USB 2.0, 1 headphone out, Microphone, and 1 IEEE 1394a	
Rear I/O	1 IEEE-1394a, 5 USB 2.0, 1 standard serial port, PS/2 keyboard and mouse, 2 RJ-45 to integrated Gigabit LAN, 1 audio line in, 1 audio line out, 1 microphone in; audio ports can be retasked to function as line in, line out, microphone, or headphone	
Integrated USB	1 USB 2.0 header (internal)	
Chassis Dimensions (H x W x D)	17.9 x 8.3 x 20.7 inches; 45.4 x 21.0 x 52.5 cm	
System Weight	Exact weights depend upon configuration Minimum config – 40 lb (19.5 kg) Standard config – 46 lb (21 kg) Maximum config – 62 lb (28 kg)	
Temperature	Operating:	40° to 95°F (5° to 35°C)
	Non-operating	–40° to 140°F (–40° to 60°C)
Humidity	Operating:	8% to 85%
	Non-operating	8% to 90%
Maximum Altitude (non-pressurized)	Operating:	10,000 feet; 3,000 m
	Non-operating	30,000 feet; 9,100 m
Power Supply	Choice of: • 800W 80+ Efficient wide-ranging, active Power Factor Correction • 1050W 80+ Efficient wide-ranging, active Power Factor Correction	
Interfaces Supported	6-channel SATA 3.0 Gb/s Interface (6 Serial-ATA connectors on the motherboard, , 2 channels are eSATA configurable for use with eSATA AMO Kit) 8-channel SAS interface (8 SAS connectors on the motherboard), 2 SAS connectors are capable of External SATA operation 1 EIDE interface (1 EIDE connector), IEEE 1394, USB 2.0	
Hard Drive Controllers Supported	SATA and SAS controllers	

Processors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Quad-Core Intel Xeon Processor 5400 Series with Intel® 64 Architecture				
Intel Xeon X5492/ 3.40 GHz, 12MB L2, 1600 MHz, FSB, 150W	Y	Y	FP477AA	
Intel Xeon X5482/ 3.20 GHz, 12MB L2, 1600 MHz, FSB, 150W	Y	Y	KY114AA	
Intel Xeon X5472/ 3.00 GHz, 12MB L2, 1600 MHz, FSB, 120W	Y	Y	KY115AA	
Intel Xeon X5470/ 3.33 GHz, 12MB L2, 1333 MHz, FSB, 120W	Y	Y	FP478AA	
Intel Xeon X5460/ 3.16 GHz, 12MB L2, 1333 MHz, FSB, 120W	Y	Y	GX575AA	
Intel Xeon X5450/ 3.00 GHz, 12MB L2, 1333 MHz, FSB, 120W	Y	Y	KD215AA	
Intel Xeon E5440/ 2.83 GHz, 12MB L2, 1333 MHz, FSB, 80W	Y	Y	GX573AA	
Intel Xeon E5430/ 2.66 GHz, 12MB L2, 1333 MHz, FSB, 80W	Y	Y	GX572AA	
Intel Xeon E5420/ 2.50 GHz, 12MB L2, 1333 MHz, FSB, 80W	Y	Y	GX571AA	
Intel Xeon E5410/ 2.33 GHz, 12MB L2, 1333 MHz, FSB, 80W	Y	Y	GX570AA	
Intel Xeon E5405/ 2.00 GHz, 12MB L2, 1333 MHz, FSB, 80W	Y	Y	GX569AA	
Dual-Core Intel Xeon Processors with Intel® 64 Architecture				
Intel Xeon X5272/ 3.40 GHz, 6 MB L2, 1600 MHz FSB, 80 watt	Y	Y	KY116AA	
Intel Xeon X5270/ 3.50 GHz, 6 MB L2, 1333 MHz FSB, 80 watt	Y	Y	FP479AA	
Intel Xeon X5260/ 3.33 GHz, 6 MB L2, 1333 MHz FSB, 80 watt	Y	Y	GX568AA	
Intel Xeon E5240/ 3.00 GHz, 6 MB L2, 1333 MHz FSB, 65 watt	Y	Y	KY198AA	
Intel Xeon E5205/ 1.86 GHz, 6 MB L2, 1066 MHz FSB, 65 watt	Y	Y	GX566AA	

When ordering two processors, the second processor must be the same as the first. Intel's numbering is not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families. See: http://www.intel.com/products/processor_number/ for details

64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. See: http://www.intel.com/info/em64t for

more information.

Quad-Core and Dual-Core are designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefits; check with software provider to determine suitability. Not all customers or software applications will necessarily benefit from use of these technologies.

Memory

NOTE: Dual Channel is only supported when the system is configured with DDR2 symmetric memory (i.e., 2 x 256)

Configure To Order (CTO)	Support Notes
PC2-5300F DDR2-667 ECC Full Buffered DIMM CTO	
HP 512MB (1x512) DDR2-667 ECC FBD RAM	
HP 1GB (2x512) DDR2-667 ECC FBD RAM	
HP 2GB (2x1GB) DDR2-667 ECC FBD RAM	
HP 4GB (4x1GB) DDR2-667 ECC FBD RAM	
HP 4GB (2x2GB) DDR2-667 ECC FBD RAM	
HP 8GB (4x2GB) DDR2-667 ECC FBD RAM	
HP 16GB (4x4GB) DDR2-667 ECC FBD RAM	
HP 16GB (8x2GB) DDR2-667 ECC FBD RAM	
HP 16GB(8x2GB)DDR2-667 ECC FBD RAM RISER	Supported ONLY w/dual processors.
HP 32GB (16x2GB) DDR2-667 ECC FBD RAM	Supported ONLY w/dual processors.
HP 64GB (16x4GB) DDR2-667 ECC FBD RAM	Supported ONLY w/dual processors.
HP 128GB (16x8GB) DDR2-667 ECC FBD RAM	Supported ONLY w/dual processors.
PC2-6400F DDR2-800 RAM ECC Fully Buffered DIMM CTO	
HP 4GB (4x1GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482
HP 8GB (4x2GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482
HP 16GB (8x2GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482
HP 16GB(8x2GB)DDR2-800 ECC FBD RAM RISER	Supported ONLY w/dual processors 5272, 5472, 5482
HP 32GB (16x2GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482 and 5492. Acoustics waiver required.
HP 32GB(8x4GB)DDR2-800 ECC FBD RAM RISER	Supported ONLY w/dual processors 5272, 5472, 5482
HP 64GB (16x4GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482 and 5492. Acoustics waiver required.

After Market Options (AMO)

PC2-5300F DDR2-667 ECC Fully Buffered DIMM AMO

512 MB (1 x 512 MB)

1 GB (1 x 1 GB)

2 GB (1 x 2 GB)

4 GB (1 x 4 GB)

8 GB (1x 8 GB)

PC2-6400F DDR2-800 RAM ECC Fully Buffered DIMM AMO

4GB (1x4GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482 and 5492
1GB (1x1GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482 and 5492.
2GB (1x2GB) DDR2-800 ECC FBD RAM	Supported ONLY w/dual processors 5272, 5472, 5482 and 5492.

PCI Express Graphics

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	Supported Multi Mixed
Professional 2D					
NVIDIA Quadro NVS 290 256 MB PCIe Graphics Card with 'DMS-59 to Dual DVI cable' included – for Workstations	Y	Y	GN502AA	See note 1	1
HP 'DMS-59 to Dual VGA' Cable Kit	Y	Y	GS567AA		1
NVIDIA Quadro NVS 440 256MB PCIe Graphics Card	N	Y	PT453A	See note 1	1
Entry 3D					
NVIDIA Quadro FX 370 256 MB PCIe Graphics Card	Y	Y	GP528AA	See note 2	1
NVIDIA Quadro FX 570 256 MB PCIe Graphics Card	Y	Y	GR521AA	See note 2	1
Mid-range 3D					
NVIDIA Quadro FX 1700 512 MB PCIe Graphics Card	Y	Y	GP529AA	See note 2	1
ATI FireGL V5600 512 MB PCIe Graphics Card	Y	Y	GT346AA		1
High-end 3D					
NVIDIA Quadro FX 3700 512MB PCI-Express Graphics Card	Y	Y	KD506AA	See note 2	1
NVIDIA Quadro FX 4800 1.5GB PCIe Graphics Card	Y	Y	FQ138AA	See note 2	1
NVIDIA Quadro FX 5600 (PCI Express x16, 1.5 GB, Dual Dual-Link DVI, Stereo) Graphics Card	Y	Y	GU095AA	See note 2; * Requires 1050 watt power supply	1
NVIDIA Quadro FX 5800 4GB PCIe Graphics Card	Y	Y	FZ559AA	See note 2; * Requires	1

				1050 watt power supply	
NVIDIA Quadro CX – The Accelerator for Creative Suite	Y	Y			1
ATI FireGL V7700 512MB PCIe Graphics Card	Y	Y	KT979AA	See note 2	1

NOTE 1: 1 or 2 of these cards are supported - 2nd card can be NVS 440 (After Market Option only) or NVS 290)
NOTE 2: 1 or 2 of these cards are supported - 2nd card must match first
I/O card must also be Gen2 in order to realize PCI Express Base 2.0 Specification (also known as PCIe Gen2) graphics performance.

SAS Hard Drives

Sub-Section Description/Notes: 8 port SAS Controller included on the system board

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations				
73 GB SAS 10K rpm SFF HDD	Y	Y	GE259AA	
146 GB SAS 10K rpm SFF HDD	Y	Y	GE261AA	
73 GB SAS 15K rpm 3Gb/s HDD	Y	Y	EA329AA	
146GB SAS 15K rpm 3Gb/s 3.5" HDD	Y	Y	EA330AA	
300GB SAS 15K rpm 3Gb/s 3.5" HDD	Y	Y	EM174AA	
450GB SAS 15K rpm 3Gb/s 3.5" HDD	Y	Y	FM803AA	

Sub-Section Description/Notes: Up to 5 SATA drives, 5 SAS* drives, or 6 SAS Small Form Factor (SFF)* drives
If 1st drive is SATA, 2nd drive can be EITHER SATA or SAS
1 GB = 1 billion bytes. Actual formatted capacity is less. Up to 8 GB of hard drive (or system disk) is reserved for the system recovery software (XP and XP Pro). Up to 12 GB of system disk is reserved for system recovery software. (Vista)

SATA Hard Drives

SATA (Serial ATA) Hard Drives for HP Workstations				
80GB SATA 7200 rpm 3Gb/s 3.5" HDD	Y	Y	PY276AA	See note 1
160GB SATA 7200 rpm 3Gb/s 3.5" HDD	Y	Y	PV944A	See note 1
250GB SATA 7200 rpm 3Gb/s 3.5" HDD (for HP xw-Workstations)	Y	Y	EA788AA	See note 1
500GB SATA 7200 rpm 3Gb/s 3.5" HDD	Y	Y	PV943A	See note 1
1000GB (1TB) SATA 7200 rpm 3.0Gb/s 3.5" HDD	Y	Y	GE262AA	See note 1
80GB SATA 10K rpm SFF in 3.5" Frame HDD	Y	Y	EM172AA	See note 1

Supported Components

160GB SATA 10K rpm SFF in 3.5" Frame HDD	Y	Y	EW222AA	See note 1
300GB SATA 10K rpm SFF in 3.5" Frame HDD	Y	Y	FM802AA	

Sub-Section Description/Notes: Up to 5 SATA drives, 5 SAS* drives, or 6 SAS Small Form Factor (SFF)* drives
If 1st drive is SATA, 2nd drive can be EITHER SATA or SAS
1 GB = 1 billion bytes. Actual formatted capacity is less. Up to 8 GB of hard drive (or system disk) is reserved for the system recovery software (XP and XP Pro). Up to 12 GB of system disk is reserved for system recovery software. (Vista)
NOTE 1: NCQ (Native Command Queuing) not supported in Red Hat Enterprise Linux

Hard Drive Controllers

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Factory integrated RAID on motherboard for SATA drives				
RAID 0 Configuration - Striped Array	Y	N		See note 1
RAID 0 Data Configuration -- Boot/OS Drive + 2 Drive Striped Array	Y	N		See note 2
RAID 1 Configuration - Mirrored Array	Y	N		See note 3
RAID 10 Configuration - Striped/Mirrored Array	Y	N		
RAID 5 Configuration - Parity Array	Y	N		See note 3
Integrated SATA 3.0 Gb/s Controller				
Integrated SATA 3.0 Gb/s Controller, RAID 0, 1, 10, 5 supported	Y	Y		
Integrated LSI SAS 1068E Controller with RAID 0, 1, 1E/10E				
Integrated LSI SAS 1068E Controller with RAID 0 (IS), RAID 1(IM), RAID 10(IME) capability	Y	Y		
HP SAS Back Panel Connector kit				
HP SAS Back Panel Connector kit	Y	Y		Must have 4 or fewer SAS hard drives to configure this option
HP SAS Back Panel Bulkhead Connector Kit				
HP SAS Back Panel Bulkhead Connector Kit	Y	Y		HP SAS Back Panel Connector kit required. Internal SAS HD drives are not supported
LSI MegaRAID® SAS 8888ELP Host Bus Adapter (HBA)				
LSI 8888ELP 8-port SAS HW RAID Card	Y	Y	GE258AA	

All RAID arrays must be less than 2 TB in size

NOTE 1: Minimum of 2 hard drives needed. All hard drives must be identical

(size/speed/type/bus/functional capabilities). Must have 2, 3 or 4 HD Drives.

NOTE 2: Minimum of 3 SATA hard drives needed. All hard drives must be identical (size/speed/type/bus/functional capabilities).

At least 3 HD Drives required. May have 4th and 5th HD Drives. Drives must be the same drive (size/speed/type/functional capability).

NOTE 3: 3 SATA or 3 SAS hard drives required. All hard drives must be identical (size/speed/type/bus/functional capabilities).
Note 4: Minimum of 3 SATA hard drives needed. All SATA hard drives must be identical (size/speed/type/bus/functional capabilities). Must have 3 or 4 HD Drives. 5 HD Drives not allowed.
LSI RAID Definitions:
* IS: Striping of 2 or more HDDs into a single logical volume
** IM: Mirroring of 2 HDDs into a single logical volume
*** IME: Mirroring of 3 or more HDDs into a single logical volume

NOTE: Specific user-configured hardware SAS RAID configurations are supported on this Linux system. Please visit: http://www.hp.com/support/linux_hardware_matrix for details

Multimedia and Audio Devices	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Thin USB Powered Speakers	Y	Y	RD628AA	
SoundBlaster X-Fi XtremeGamer Audio Card (PCI)	Y	Y	GE257AA	
Integrated Intel/Realtek HD ALC262 Audio	Y	Y		

Optical and Removable Storage	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
1.44 MB Diskette Drive (1 only)	Y	Y	DY670A	See NOTE 1
HP 16X DVD-ROM SATA Drive	Y	Y	EW268AA	See NOTE 2
HP 16X DVD+-RW SuperMulti SATA Drive	Y	Y	EW269AA	See NOTE 3

NOTE 1: May only order one.
NOTE 2: Cannot be 2nd drive.
NOTE 3: LightScribe, is supported on Windows ONLY and creates a grayscale image similar to black and white photography. LightScribe media required and sold separately. Double-layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.
Actual speeds may vary. Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses.

Supported Components

Networking and Communications	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Integrated DUAL Broadcom 5755 NetXtreme Gigabit Ethernet PCIe Controller	Y	N		
Intel Pro 1000 PT PCIe Gigabit NIC Card	Y	Y	EH352AA	
Broadcom 5751 NetXtreme Gigabit Ethernet PCIe NIC	Y	Y	EA833AA	

The term "10/100/1000" or "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

Controller Cards	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP xw8/94 SAS Back Panel Connector Kit	Y	Y	EM164AA	
HP FireWire 800 IEEE-1394b 3-Port PCI Card	Y	Y	EA327AA	
HP FireWire/IEEE 1394a PCI Card	Y	Y	PA997A	

Input Devices	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP PS/2 Standard Keyboard	Y	Y	DT527A	
HP USB Standard Keyboard	Y	Y	DT528A	
HP USB Smart Card Keyboard	Y	Y	ED707AA	
HP USB Laser Mouse	Y	Y	GW405AA	
HP USB 2-Button Optical Scroll Mouse	Y	Y	DC172B	
HP USB Optical 3-Button Mouse	Y	Y	DY651A	
HP SpaceExplorer 3D USB Controller	Y	Y	RY429AA	
HP PS/2 Optical Scroll Mouse	Y	Y	EY703AA	
HP USB Optical 3-Button 2.9M OEM Mouse	Y	Y	ET424AA	
HP SpacePilot 3D USB Intelligent Controller	Y	Y	EF390AA	

Racking and Physical Security	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP xw8/9 PCI Hold Down Kit, Bulk 10 Pack	Y	Y	EN764AA	
HP Business PC Security Lock Kit	Y	Y	PV606AA	
Security Cable with Kensington Lock	Y	Y	PC766A	
xw8400 Slide Rack Kit IT/Broadcast	Y	Y	DY664A	

Supported Components

Monitors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP LP3065 30-inch Widescreen LCD Monitor	Y	Y	EZ320A4	
HP LP2465 24-inch Widescreen LCD Monitor	Y	Y	EF224A4	
HP LP2065 20-inch LCD Monitor	Y	Y	EF227A4	
HP LP1965 19-inch LCD Monitor	Y	Y	RA373AA	

NOTE: Supported by all Operating Systems available from HP

Other Hardware

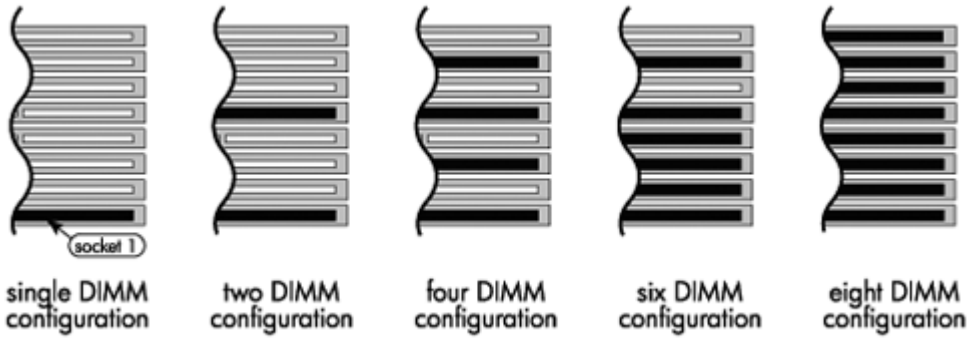
	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Workstation Mouse Pad	Y	Y		
HP ENERGY STAR 4.0 Enabled Configuration	Y	Y		
Chassis Intrusion Switch	Y	Y		
HP Internal USB Port Kit	Y	Y	EM165AA	
HP SAS Back Panel Connector Kit	Y	Y	EM164AA	
HP Fan and Front Card Guide Kit	Y	Y	EM163AA	

Software

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Alert Standard Format specification	Y	Y		Standard
HP Performance Tuning Framework	Y	Y		
Roxio Easy Media Creator (CD or DVD burner)	Y	Y		
Intervideo WinDVD with DVD player	Y	Y		
HP Backup and Recovery	Y	Y		
PDF Complete	Y	Y		
HP ProtectTools Quantity 500 Software	Y	Y		
Microsoft Office 2007 Small Business Edition	Y	Y		
Microsoft Office 2007 Trial Edition	Y	Y		
HP Client Manager Software v6.2 (optional download)	Y	Y		
HP ProtectTools Security	Y	Y		

Supported Components

Operating Systems	Support Notes
Genuine Windows Vista® Business 32-bit with downgrade to Windows® XP Professional 32-bit custom installed	Certain Windows Vista product features require advanced or additional hardware. See http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor. (See para below which also applies)
Genuine Windows Vista® Business 64-bit with downgrade to Windows® XP Professional x64 custom installed	(See paragraph above which also applies) Windows Vista Business disk also included for future upgrade if desired. To qualify for this downgrade, an end user must be a business (including governmental or educational institutions) and is expected to order at least 25 customer systems with the same custom image.
Genuine Windows Vista® Business 32-bit	
Genuine Windows Vista® Business 64-bit	
HP Linux Installer Kit	

System Board	
System Board Form Factor	SSI-EEB (E-ATX 12" x 13")
Processor Socket	Dual LGA 771
Chipset	Intel® 5400
Super I/O Controller	SMSC SCH5327
DIMM Connectors (FBD DDR2	8 (16 with Risers)
Memory	
Maximum Memory	Supports up to 128 GB of DDR2 Fully Buffered DIMMs . Memory risers are required to support larger memory configurations (at launch, Configure-to-order HP xw8600 Workstations ordered with more than 16 GB of memory will require riser modules). Large capacity 8 GB DIMMs require the use of riser cards. No quad ranked DIMM should be used in the HP xw8600 without riser cards.
	

	Slot 1		Slot 2		Slot 3		Slot 4		Slot 5		Slot 6		Slot 7		Slot 8	
512 MB (single channel performance configuration)	512 MB															
1 GB	1 GB															
1 GB	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			
4 GB	512 MB		512 MB		512 MB		512 MB		512 MB		512 MB		512 MB		512 MB	
6 GB	1 GB		1 GB		1 GB		1 GB		1 GB				1 GB			
8 GB	2 GB				2 GB				2 GB				2 GB			
8 GB	1 GB		1 GB		1 GB		1 GB		1 GB		1 GB		1 GB		1 GB	
16 GB (riser)	8 GB								8 GB							
16 GB	2 GB		2 GB		2 GB		2 GB		2 GB		2 GB		2 GB		2 GB	
16 GB	4 GB				4 GB				4 GB				4 GB			
32 GB	4 GB		4 GB		4 GB		4 GB		4 GB		4 GB		4 GB		4 GB	
32 GB (requires riser cards)	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB
64 GB (requires riser cards)	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB
128 GB (requires riser cards)	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB

Memory Configuration (Supported)	Not all memory configurations possible are represented below. Also, 512 MB configurations are not supported for 64-Bit operating systems.	
DDR2 ECC REGISTERED FB-DIMM MEMORY	Use only fully-buffered, PC2-5300F DIMMS (FB-DIMMs). Match DIMMs by size and type. With the exception of the single-DIMM configuration, all memory should be added in like pairs. Use HP memory only. If using only one DIMM, install in socket 1 (bottom DIMM slot when rear inputs/outputs of motherboard are facing left). If using 2 DIMMs, install in sockets 1 & 5, matched by size and type. If using more than 2 DIMMs, pairs must be matched by size and type in sockets 1 and 3, 5 and 7, 2 and 4, and 6 and 8; this may require moving the DIMM in socket 5 to socket 3. If using 8 DIMMs, install in all sockets.	
PCI Express Connectors (Gen2 Rev 0.7 connectors)	1 PCI Express x16 Gen2 graphics slot 75W+75W 1 PCI Express x16 Gen2 (x16 or x8 selectable) 75W+75W 1 PCI Express x8 (x8 or x1 selectable) 2 PCI Express x8 (x4 electrically)	
PCI Connectors (5.0V)	1 half- length/full-height 33 MHz 32-Bit 1 PCI-X 133MHz (full length/height)	
Interfaces Supported	**SATA**	6 SATA only connectors 2 of these SATA connectors (color coded red) can be used for External SATA (eSATA) with the appropriate eSATA After Market Option kit
Serial Attached SCSI	8 SAS connectors	
Integrated RAID	Integrated SATA Raid • RAID 0, 1, 10, 5	

	• Supports one RAID array with 2-6 drives • RAID 0 configuration - striped array • RAID 0 configuration - data array • RAID 1 configuration - mirrored array • RAID 10 configuration - stripe of mirrors • RAID 5 configuration - parity striping Notes: NOTE: Hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit: http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux. Integrated SAS Raid (LSI 1068X) • RAID 0, 1, 10 • Support one RAID array with 2-5(6 using 2.5" drives) drives • Supports two RAID arrays with 2 drives each • RAID 0 Configuration - Striped Array • RAID 1 Configuration - Mirrored Array • RAID 10 Configuration - Stripe of Mirrors • External RAID arrays possible Notes: NOTE: Specific user-configured hardware SAS RAID configurations are supported on this Linux system. Please visit: http://www.hp.com/support/linux_hardware_matrix for details.	
PCI-X Connectors	1 full-length/full-height 133 MHz 64-Bit	
PCI Card Guide	Optional, tool-free support for all full-length cards with PCI extender	
Integrated Gigabit Ethernet	2 Broadcom BCM5755 A2	
Wake on LAN	Yes	
Integrated Trusted Platform Module	TPM 1.2	
ASF 1.0 & 2.0 (Alert Standard Format)	Yes	
IEEE 1394 Connector(s)	Front	1 IEEE 1394a header for front connector (Not supported in Linux)
	Rear	1 IEEE 1394a rear connector
USB Connector(s)	Front	2 on header for front connectors
	Rear	5 rear
	Internal	1 internal
HD Integrated Audio	High Definition Integrated Realtek ALC262 Audio with Line in, Line Out, Microphone, Headphone	
Flash ROM	Yes	
CPU Fan Header	2	
Chassis Fan Header	2	
CMOS Battery Holder - Lithium	Yes	
Power Supply Headers	2x12 connector, 2x4 CPU connector, 2x3 memory connector	

System Technical Specifications

Power Switch, Power LED & Hard Drive LED Header	Power switch, power LED, and hard drive LED cables connect to the Control Panel connector. There is also a 2 pin header to connect a SCSI LED cable to the motherboard.
Clear Password Jumper	Yes
Power Supply	800W Custom PSU - (Wide Ranging, Active PFC) 1050W Custom PSU - (Wide Ranging, Active PFC)
Operating Voltage Range	90 - 269 VAC
Rated Voltage Range	100 - 240 VAC, 118 VAC
Rated Line Frequency	50/60Hz, 400Hz
Operating Line Frequency Range	47 - 66 Hz, 393 - 407 Hz
Rated Input Current	800W Custom PSU: 10.0A @ 100-127 VAC, 6A @ 200-240 VAC, 9.5A @ 118 VACC 1050W Custom PSU: 13.2A @ 100-127 VAC, 6.6A @ 200-240 VAC, 12.0A @ 118 VAC
Heat Dissipation	800W Custom PSU: Typical 1530 btu/hr (386 kg-cal/hr), Maximum 2027 btu/hr (511 kg-cal/hr) 1050W Custom PSU: Typical 3136 btu/hr (791 kg-cal/hr), Maximum 4480 btu/hr (1129kg-cal/hr)
Power Supply Fan	92x32 mm variable speed
ENERGY STAR® qualified (Config Dependent)	Yes
80 PLUS Compliant	Yes
FEMP Standby Power Compliant 115V (Wake-on LAN disabled) (<2W in S5 - Power Off)	Yes
Power consumption in sleep mode (as defined by ENERGY STAR) - Suspend to RAM (S3)	800W Custom PSU: <20W 1050W Custom PSU: <25W
CD-ROM IN (audio)	No
AUX IN (audio)	Yes
Clear CMOS Button	Yes
Chassis Speaker Header	Yes
Multibay Header	No
Integrated Gigabit Ethernet	2 Broadcom BCM5755 A2
Hood Lock Header	Yes
Hood Sensor Header	Yes, as part of the front control panel header, connected by cable-to-switch. Cable/Switch assembly is a configure-to-order option.
System Configurations	

System Technical Specifications

Example Configuration #1	Processor Info	1x Xeon 5130 2.00GHz
	Memory Info	4x1GB DR 667MHz
	Graphics Info	1xFX1700
	Disks/Optical/Floppy	1x160GB SATA/1 Optical/1 Floppy

Energy Consumption		115 VAC LAN Enabled	115 VAC LAN Disabled	230 VAC LAN Enabled	230 VAC LAN Disabled	100 VAC LAN Enabled	100 VAC LAN Disabled
	Windows Idle (S0)	140.2W	140.2W	137.9W	137.9W	141.3W	141.3W
	Windows Busy Typ(S0)	190.3W	190.3W	182.7W	182.7W	192.3W	192.3W
	Windows Busy Max (S0)	203.1W	203.1W	201.8W	201.8W	200.8W	200.8W
	Sleep (S3)	6.26W	4.59W	6.53W	4.92	6.25W	4.61W
	Off (S5)	3.00W	1.39W	3.29W	1.68W	2.97W	1.36W
Heat Dissipation		115 VAC LAN Enabled	115 VAC LAN Disabled	230 VAC LAN Enabled	230 VAC LAN Disabled	100 VAC LAN Enabled	100 VAC LAN Disabled
	Windows Idle (S0)	478.5 btu/hr	478.5 btu/hr	470.6 btu/hr	470.6 btu/hr	482.3 btu/hr	482.3 btu/hr
	Windows Busy Typ(S0)	649.5 btu/hr	649.5 btu/hr	623.6 btu/hr	623.6 btu/hr	656.3 btu/hr	656.3 btu/hr
	Windows Busy Max (S0)	693.2 btu/hr	693.2 btu/hr	688.7 btu/hr	688.7 btu/hr	685.3 btu/hr	685.3 btu/hr
	Sleep (S3)	21.4 btu/hr	15.7 btu/hr	22.3 btu/hr	21.4 btu/hr	15.7 btu/hr	22.3 btu/hr
	Off (S5)	10.2 btu/hr	4.71 btu/hr	11.2 btu/hr	10.2 btu/hr	4.71 btu/hr	11.2 btu/hr

Declared Noise Emissions (Entry-level)		
System Configuration (Entry level)	Processor Info	Dual Intel Xeon E5440 2.83GHz CPUs
	Memory Info	4 x 1GB FBD memory
	Graphics Info	NVIDIA NVS 290 graphics, 800 W PSU
	Disks/Optical/Floppy	One 250 GB 7200RPM SATA, Floppy, and DVD ROM optical

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	4.2	24
	SATA Hard drive Operating (random reads)	4.2	24
	Floppy Drive Operating (continuous copy)	4.5	28
	DVD-ROM Operating (sequential reads)	5.1	36

System Configuration (High-end)	Processor Info	Dual Intel Xeon E5460 3.16 GHz CPUs
	Memory Info	4 x 1GB FBD memory
	Graphics Info	nVidia FX4600 Graphics, 1050 W PSU
	Disks/Optical/Floppy	Two 146 GB 15K RPM SAS, Floppy, and DVD ROM optical

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	4.7	29

	SATA Hard drive Operating (random reads)	4.9	31
	Floppy Drive Operating (continuous copy)	4.9	31
	DVD-ROM Operating (sequential reads)	5.2	36

Physical Security and Serviceability	
Access Panel	Tool-less, one-handed
Optical Drive	Tool-less
Floppy Drive	Drive requires screws to attach to bracket, once attached to mounting bracket, it latches tool-lessly to chassis
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
Restore CD Set	Restores the computer to its original factory shipping image - Can be obtained via HP Support
Dual Function Front Power Switch	Causes a fail-safe power off when held for 4 seconds
Padlock Support	Prevents entire system theft and discourages access panel removal. 7mm diameter padlock loop at rear of system. (optional)
Cable Lock Support	Kensington Cable Lock: Prevents entire system theft only. 3mm x 7mm slot at rear of system (optional)
Universal Chassis Clamp Lock Support	The version without a cable discourages access panel removal and prevents theft of IO devices. The version with a cable additionally prevents entire system theft and allows multiple systems to be secured with a single cable. (optional)
Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control	Enables or disables serial, parallel, USB, audio, SAS 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 workstation
Setup Password	Prevents an unauthorized person from changing the workstation configuration
CPUs and Heatsinks	A torx driver is needed to remove the CPU heatsink before the CPU can be removed. CPU removal is tool-less
OS CD (Restore OS CD)	Restores computer to its original factory shipping Operating System - No recovery CDs will ship with Windows XP, Vista or Linux - an ISO image will be available on an HD partition.
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments
Power Supply Fans	92 mm x 32 mm
CPU Heatsink Fan(s)	80 mm x 15 mm (single or dual)
Chassis Fans	One 120 mm x 25 mm
Memory Fans	92 mm x 25 mm (for systems without memory risers)

Insight Diagnostics	HP Insight Diagnostics Offline Edition The diagnostics utility enables you to perform testing and to view critical computer hardware and software configuration information from various sources. This utility enables you to: • Run diagnostics • View the hardware configuration of the system Key features and benefits HP Insight Diagnostics simplifies the process of effectively identifying, diagnosing, and isolating the hardware issues. In addition to robust management tools, service tools can be invaluable in quickly resolving system problems. To streamline the service process and resolve problems quickly, it is necessary to have the right information available at the time that a service call is placed. The primary information requirement, which is also the one that provides the greatest insight into potential system issues, is the configuration of the system. Insight Diagnostics helps provide higher system availability. Typical uses of the Insight Diagnostics are: • Testing and diagnosing apparent hardware failures • Documenting system configurations for upgrade planning, standardization, inventory tracking, disaster recovery, and maintenance • Sending configuration information to another location for more in-depth analysis
Access Panel Key Lock	Prevents removal of the access panel and all internal components including optical and floppy drives

BIOS	
BIOS 32-bit Services	Standard BIOS 32-Bit Service Directory Proposal v0.4
PCI 3.0 Support	Full BIOS support for PCI Express through industry standard interfaces.
ATAPI	ATAPI Removable Media Device BIOS Specification Version 1.0
BBS	BIOS Boot Specification v1.01
WMI Support	WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications.
BIOS Boot Spec 1.01+	Provides more control over how and from what devices the workstation will boot.
ROM Based Computer Setup Utility (F10)	Review and customize BIOS settings
System/Emergency ROM Flash Recovery with Video	Recovers corrupted system BIOS
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
SMBIOS	System Management BIOS 2.5, previously known as DMI BIOS, for system management information
Boot Control	Prevents ability to boot from removable media on supported devices (and can disable writes to media)
Memory Change Alert	Alerts management console if memory is removed or changed
Thermal Alert	Monitors the temperature state within the chassis. Three modes: • NORMAL - normal temperature ranges • ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown • SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs

System Technical Specifications

Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console
ACPI (Advanced Configuration and Power Management Interface)	• Allows the system to enter and resume from low power modes (sleep states) • Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system • Supports ACPI 2.0 for full compatibility with 64-bit operating systems
Ownership Tag	Allows user or MIS to set unique tag string in ROM
Remote Wakeup/Remote Shutdown	• System administrators can power on, restart, and power off a client computer from a remote location. • Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.
ASF 2.0 Compliant	Allows workstation status to be monitored on a remote console.
Instantly Available PC (Suspend to RAM - ACPI sleep state S3)	Allows for very low power consumption with quick resume time
Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system
ROM revision levels	Identifies system BIOS revision level and reports in ROM-based F10 setup. Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information
System board revision level	Allows management SW to read the revision level of the system board
Start-up Diagnostics (Power-on Self-Test)	Review and customize BIOS settings
Auto Setup when new hardware installed	System automatically detects addition of new hardware
Keyboard-less Operation	The system can be operated without a keyboard
Localized ROM Setup	Common BIOS image supports configuration (Setup) in 12 languages, with local keyboard mappings
Asset Tag	Allows user or MIS to set unique tag string in ROM
Per-slot Control	Allows individual slot configuration (option ROM., latency)
Adaptive Cooling	Fan control parameters are set according to detected hardware configuration for optimal acoustics
Pre-boot Diagnostics	Early (pre-video) critical errors are reported via beeps and blinks on the power LED
Industry Standard Specification Support	
Industry Standard	Revision Supported by the BIOS
ACPI	Advanced Configuration and Power Management Interface, Version 2.0c
ASF	Alert Standard Format Specification, Version 2.0
ATA (IDE)	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
CD Boot	"El Torito" Bootable CD-ROM Format Specification Version 1.0
EDD	• Enhanced Disk Drive Specification Version 1.1 • BIOS Enhanced Disk Drive Specification Version 3.0
PCI	• PCI Local Bus Specification, Revision 2.3 • PCI Power Management Specification, Revision 1.1
PCI Express	PCI Express Base Specification, Revision 1.1

PMM	POST Memory Manager Specification, Version 1.
SATA	• Serial ATA Specification, Revision 1.0a • Serial ATA 3 Gb/s: Extensions to Serial ATA 1.5 Gb/s, Revision 1.0
SPD	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
TPM	Trusted Computing Group TPM Specification Version 1.2
UHCI	Universal Host Controller Interface Design Guide, Revision 1.1
USB 1.1	Universal Serial Bus Revision 1.1 Specification
USB 2.0	Universal Serial Bus Revision 2.0 Specification
SMBIOS	System Management BIOS Reference Specification, Version 2.5

System Software Management and Updating	
HP Client Management Solutions	Visit: http://www.hp.com/go/easydeploy
Social and Environmental Responsibility	
Eco-Label Certifications & Declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • US Energy Star 4.0 (Not in Linux) • US Federal Energy Management Program (FEMP) • China Energy Conservation Program • IT ECO declaration • Japan PC Green label* * This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'
Batteries	This product complies with ISO standards: • EU Directive 91/ 157/ EEC • EU Directive 93/ 86/ EEC • EU Directive 98/ 101/ EEC Batteries used in the product do not contain: • Mercury greater than 5ppm by weight • Cadmium greater than 10ppm by weight • Lead greater than 4000ppm by weight Battery size: CR2032 (coin cell) Battery type: Lithium
Restricted Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Certain Azo Colorants • Certain Brominated Flame Retardants - may not be used as flame retardants in plastics • Cadmium • Chlorinated Hydrocarbons

	• Chlorinated Paraffins • Formaldehyde • Halogenated Diphenyl Methanes • Lead carbonates and sulfates • Lead and Lead compounds • Mercuric Oxide Batteries • Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user. • Ozone Depleting Substances • Polybrominated Biphenyls (PBBs) • Polybrominated Diphenyl Ethers (PBBEs) • Polybrominated Biphenyl Oxides (PBBOs) • Polychlorinated Biphenyl (PCB) • Polychlorinated Terphenyls (PCT) • Polyvinyl Chloride (PVC), except for wires and cables and certain retail packaging, has been voluntarily removed from most applications. • Radioactive Substances • Tributyl Tinches (TBT), Triphenyl Tinches (TPT), Tributyl Tin Oxide (TBTO)
Packaging	HP follows these guidelines to decrease the environmental impact of product packaging: • Eliminate the use of heavy metals such as lead, chromium, mercury, and cadmium in packaging materials. • Eliminate the use of ozone-depleting substances (ODS) in packaging materials. • Design packaging materials for ease of disassembly. • Maximize the use of post-consumer recycled content materials in packaging materials. • Use readily recyclable packaging materials such as paper and corrugated materials. • Reduce size and weight of packages to improve transportation fuel efficiency. • Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.
Longevity and Upgrading	• This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 5 years after the end of production. Upgradability features contained in the product include: • Intel LGA775 processor sockets • 8 USB ports • 1 PCI 32-bit/33MHz slot, 1 PCI-X slot and 5 PCI Express slots • 8 expansion bays • 8 - 16 memory slots, depending on configuration
Packaging Materials	
External	Cardboard carton and insert: 2.70 kg
Internal	LDPE Foam: 0.35 kg
End-of-Life Management and Recycling	Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered, or disposed of in a responsible manner.
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: [link to new HP white paper now in progress] Global Citizenship Report: http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications: http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html
Service, Support and Warranty	On-site Warranty and Service (Note 1): This three-year, limited warranty and service offering delivers three years of on-site, next business-day (Note 2) service for parts and labor and includes free telephone support

	(Note 3) 8am - 5pm. Global coverage (Note 2) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC. • Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043. • This product contains 0% recycled materials (by wt.) • This product is >90% recycle-able when properly disposed of at end of life.

Processors	Intel Xeon X5492/ 3.40 GHz, 12MB L2, 1600 MHz, FSB, 150W	FP477AA
	Intel Xeon X5482/ 3.20 GHz, 12MB L2, 1600 MHz, FSB, 150W	KY114AA
	Intel Xeon X5472/ 3.00 GHz, 12MB L2, 1600 MHz, FSB, 120W	KY115AA
	Intel Xeon X5470/ 3.33 GHz, 12MB L2, 1333 MHz, FSB, 120W	FP478AA
	Intel Xeon X5460/ 3.16 GHz, 12MB L2, 1333 MHz, FSB, 120W	GX575AA
	Intel Xeon X5450/ 3.00 GHz, 12MB L2, 1333 MHz, FSB, 120W	KD215AA
	Intel Xeon E5440/ 2.83 GHz, 12MB L2, 1333 MHz, FSB, 80W	GX573AA
	Intel Xeon E5430/ 2.66 GHz, 12MB L2, 1333 MHz, FSB, 80W	GX572AA
	Intel Xeon E5420/ 2.50 GHz, 12MB L2, 1333 MHz, FSB, 80W	GX571AA
	Intel Xeon E5410/ 2.33 GHz, 12MB L2, 1333 MHz, FSB, 80W	GX570AA
	Intel Xeon E5405/ 2.00 GHz, 12MB L2, 1333 MHz, FSB, 80W	GX569AA

Introduction

The Quad-Core Intel® Xeon® Processor 5400 Series is a workstation processor utilizing four 45-nm Hi-k next generation Intel® Core™ microarchitecture cores. The processor is manufactured on Intel's 45 nanometer process technology combining high performance with the power efficiencies of a low-power microarchitecture. These processors maintain the tradition of compatibility with IA-32 software. Some key features include on-die, primary 32-kB instruction cache and 32-kB write-back data cache in each core and 12 MB (2 x 6MB) Level 2 cache with Intel® Advanced Smart Cache Architecture. The 1333 MHz Front Side Bus (FSB) is a quad-pumped bus running off a 333 MHz system clock making 10.66 GBytes per second data transfer rates possible. The 1600 MHz Front Side Bus (FSB) is a quad-pumped bus running off a 400 MHz system clock making 12.80 GBytes per second data transfer rates possible. Quad-Core Intel Xeon Processor 5400 Series supports Enhanced Intel SpeedStep® Technology*. This technology enables the processor to switch between multiple frequency and voltage points, which results in platform power savings.

In addition, the Quad-Core Intel® Xeon® Processor 5400 Series supports the Execute Disable Bit functionality. When used in conjunction with a supporting operating system, Execute Disable allows memory to be marked as executable or non executable. This feature can prevent some classes of viruses that exploit buffer overrun vulnerabilities and can thus help improve the overall security of the system.

NOTE: When ordering two processors, the second processor must be the same as the first. Intel's numbering is not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families. See: http://www.intel.com/products/processor_number/ for details.

64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. See: http://www.intel.com/info/em64t for more information.

Quad-Core and Dual-Core are designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefits; check with software provider to determine suitability. Not all customers or software applications will necessarily benefit from use of these technologies.

Performance and Features

- Quad-core processing
  - Significantly increases performance headroom over previous generation dual-core processors
  - Helps boost an operating system's ability to multitask
- 1333 and 1600 MHz Front Side Bus

- 12 MB shared L2 cache
- Reduces latency and maximizes the use of main memory-to-processor bandwidth
- Cache is dynamically allocated between cores, as needed

- Intel Extended Memory 64 Technology (EM64T)
- Enhanced Halt State (C1E)
- Demand Based Switching
- Enhanced Intel SpeedStep Technology
- Virtualization Technology
  - Supports software-based virtualization
  - Enables migration of 64-bit O/Ss and applications to virtual environments
- Smart Memory Access
- Intel Thermal Monitor 2

NOTE: Not supported on the E5405 processor.

Service and Support

The Quad-Core Intel Xeon Processor 5400 Sequence has a one-year limited warranty or the remainder of the warranty of the HP product in which they are installed. Technical support is available seven days a week, 24 hours a day by phone, as well as online support forums. Certain restrictions and exclusions apply.

Speeds	System Bus Frequency	Cache Type
3.40 GHz	1600 MHz Front Side Bus	12MB shared L2 cache
3.20 GHz	1600 MHz Front Side Bus	12MB shared L2 cache
3.00 GHz	1600 MHz Front Side Bus	12MB shared L2 cache
3.33 GHz	1333 MHz	12MB L2
3.16 GHz	1333 MHz	12MB L2
3.00 GHz	1333 MHz	12MB L2
2.83 GHz	1333 MHz	12MB L2
2.66 GHz	1333 MHz	12MB L2
2.50 GHz	1333 MHz	12MB L2
2.33 GHz	1333 MHz	12MB L2
2.00 GHz	1333 MHz	12MB L2

Maximum Virtual Memory	Limited by OS
SIMD Extensions Supported	SSE2, SSE3 and SSE4.1

Processors	Intel Xeon E5205/ 1.86 GHz, 6 MB L2, 1066 MHz FSB, 65 watt	GX566AA
	Intel Xeon E5240/ 3.00 GHz, 6 MB L2, 1333 MHz FSB, 65 watt	KY198AA
	Intel Xeon X5260/ 3.33 GHz, 6 MB L2, 1333 MHz FSB, 80 watt	GX568AA
	Intel Xeon X5270/ 3.50 GHz, 6 MB L2, 1333 MHz FSB, 80 watt	FP479AA
	Intel Xeon X5272/ 3.40 GHz, 6 MB L2, 1600 MHz FSB, 80 watt	KY116AA

Technical Specifications - Processors

Speeds	System Bus Frequency	Cache Type
1.86 GHz	1066 MHz FSB	L2
3.00 GHz	1333 MHz FSB	L2
3.33 GHz	1333 MHz FSB	L2
3.50 GHz	1333 MHz FSB	L2
3.40 GHz	1600 MHz FSB	L2

NVIDIA Quadro NVS 290 256 MB PCIe Graphics Card	Form Factor	Low Profile
	Bus Type	PCIe x16
	Memory	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DMS-59, includes DMS-59 to Dual DVI-I cable. DMS-59 to Dual VGA cable available as an option.
	Maximum Resolution	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Image Quality Features	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
	Programmable Video Processor	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
	Display Output	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	Supported Graphics APIs	OGL 2.1 & DX10 Support; Shader Model 4.0
	Available Graphics Drivers	Genuine Windows Vista Business(64-bit and 32-bit), Microsoft Windows XP Professional(64-bit and 32-bit)(Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode) Red Hat Enterprise Linux(RHEL) WS3, WS4 & 5 Desktop/Workstation HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html. Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution AntiAliasing	Color planes: 32-bit color buffer Overlay planes: Hardware supported
	Option kit contents	NVIDIA Quadro NVS 290 (256 MB DH) PCIe Graphics Card with full height bracket attached, DMS-59 to Dual DVI cable, Workstation Software Driver CD, documentation.

Technical Specifications - Graphics

NVIDIA Quadro NVS 440 256 MB Graphics Controller	Form Factor	ATX
	Graphics Controller	2 nv43 2D graphics processor units (GPUs)
	VGA controller	Integrated into the Quadro GPU
	Bus Type	PCI-E x16
	RAMDAC	Dual 350 MHz
	Memory	256 MB DDR frame buffer and Texture storage (128MB per GPU)
	Connector	Two DMS-59
	Controller clock speed	250 MHz
	Color planes	32-bit color buffer
	Overlay planes	1 16-bit Video overlay plane
	Maximum pixel clock	350 MHz
	Multi-Monitor Support	Up to 4 analog or digital monitors
	Single DVI Support	Yes
	Dual DVI Support	Yes
	High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	Available graphics drivers	Microsoft Windows Vista Business 32 or 64, Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Linux - Full Open GL implementation, complete with NVIDIA and ARB extensions. HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html.

NVIDIA Quadro FX 370 256 MB PCIe Graphics Card	Form Factor	ATX
	Bus Type	PCI-Express x16
	Memory	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I (dual-link) and DVI-I (single-link)
	Maximum Resolution	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Display Output	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®

Technical Specifications - Graphics

	Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Vertex/Pixel Shader 4.0 Shading Support (HLSL, GLSL, CgFX)
	Supported Graphics APIs	OGL 2.1 & SM4.0 and DirectX10 Support
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS3, WS4 & 5 Desktop/Workstation Qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution AntiAliasing	High Resolution Anti-Aliasing PureVideo 2 engine supports AES 128-bit decryption GPU Computing (HW/SW including CUDA SDK 3D Textures LightSpeed Memory Architecture II 128-bit color precision Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes H/W accelerrated pixel readback 3rd generation occlusion culling AA on scan-out
	Power consumption	<50 W
NVIDIA Quadro FX 570 256 MB PCIe Graphics Card	Form Factor	ATX
	Bus Type	PCI-Express x16
	Memory	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I (dual-link) and DVI-I (dual-link)
	Maximum Resolution	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	RAMDAC	Integrated dual 400MHz
	Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Vertex/Pixel Shader 4.0 Shading Support (HLSL, GLSL, CgFX)
	Supported Graphics APIs	OGL 2.1 & SM4.0 and DirectX10 Support
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS3, WS4 & 5 Desktop/Workstation Qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution	High Resolution Anti-Aliasing

	AntiAliasing	PureVideo 2 engine supports AES 128-bit decryption GPU Computing (HW/SW including CUDA SDK 3D Textures LightSpeed Memory Architecture II 128-bit color precision Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes H/W accelerrated pixel readback 3rd generation occlusion culling AA on scan-out
	Option kit contents	PCA with ATX bracket, DVI to VGA converters, HDTV dongle, CD and manual.
	Power consumption	<60 W
NVIDIA Quadro FX 1700 512 MB PCIe Graphics Card	Form Factor	ATX
	Bus Type	PCI Express x16
	Memory	512 MB 400 MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I (dual-link) and DVI-I (dual-link) and HD-out (a separate cable - not included - is required to use HD TV monitors)
	Maximum Resolution	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link).
	RAMDAC	Integrated dual 400MHz
	Display Output	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1920x1200 (single-link) and 3840x2400 (dual-link). NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Vertex/Pixel Shader 4.0 Shading Support (HLSL, GLSL, CgFX)
	Supported Graphics APIs	OGL 2.1 & SM4.0 and DirectX10 Support
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS3, WS4 & 5 Desktop/Workstation Qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution AntiAliasing	High Resolution Anti-Aliasing PureVideo 2 engine supports AES 128-bit decryption GPU Computing (HW/SW including CUDA SDK 3D Textures LightSpeed Memory Architecture II 128-bit color precision Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes

		H/W accelerated pixel readback 3rd generation occlusion culling AA on scan-out
	Option kit contents	PCA with ATX bracket, DVI to VGA converters, CD and manual.
	Power consumption	<75 W

ATI FireGL V5600 512 MB PCIe Graphics Card	Form Factor	ATX
	Graphics Controller	R520
	Bus Type	PCI Express x16
	Memory	512 MB f unified frame buffer, Z-buffer and Texture storage and a 128-bit Ring-Bus memory controller
	Connectors	Two dual-link DVI connectors with analog/digital outputs
	Maximum Resolution	Dual Link digital support for 3840 x 2400 @ 60Hz. Ideal for 30-inch widescreen displays.
	RAMDAC	Dual 10-bit per channel 400MHz
	Ring Bus Memory Controller	512-bit internal ring bus for highly efficient memory reads Programmable intelligent arbitration logic
	Display Output	Up to 16-bit per RGB color component High Dynamic Range output (HDR) Programmable piecewise linear gamma correction, color correction, and color space conversion (10-bits per color)
	Shading Architecture	Supports Full Shader Model 4.0 120 shader processing unit
	Supported Graphics APIs	DirectX 10 and OpenGL 2.1 advanced
	Available Graphics Drivers	Microsoft Windows XP Professional qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html. HP-tested Windows XP and Microsoft Windows Vista 32 and 64, Microsoft Windows XP. HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Option kit contents	PCA with ATX bracket, DVI to VGA converters, CD and manual.

Technical Specifications - Graphics

NVIDIA Quadro FX 3700 Graphics Card	Form Factor	ATX
	Graphics Controller	NVIDIA NV71GL-U
	Bus Type	PCI Express x16
	Memory	512MB 700MHz GDDR3 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	2 dual-link DVI-I + 3-pin Mini DIN stereo output
	Maximum Resolution	Dual DVI-I output - drives dual digital displays at resolutions up to 2560x1600 @ 60Hz Internal 400MHz RAMDACs - drives dual analog displays up to 2048x1536 @ 85Hz each
	RAMDAC	Dual 400MHz integrated
	Display Output	Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 2560x1600 @ 60Hz. NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft® Windows®
	Shading Architecture	Fully programmable GPU (OpenGL 2.0/DirectX 9.0c class) Long fragment programs (unlimited instructions) Long vertex programs (unlimited instructions) Looping and subroutines (up to 256 loops per vertex program) Dynamic flow control Conditional execution
	Supported Graphics APIs	OpenGL 2.1 DirectX 10.0
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS3, WS4 & 5 Desktop/Workstation Qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution AntiAliasing	256-bit memory interface 128-bit IEEE floating-point precision graphics pipeline 128-bit color precision 32x FSAA dramatically reduces visual aliasing artifacts at resolution up to 1920x1200 Hardware accelerated anti-aliased points and lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes 3rd generation occlusion culling 3D volumetric texture support Quad-buffered stereo Dual Link DVI enabling driving digital displays up to 2560x1600 @ 60Hz SLI Link
	Option kit contents	PCA with ATX bracket, DVI to VGA converters, CD and manual

Technical Specifications - Graphics

NVIDIA Quadro FX 4800 1.5GB PCIe Graphics Card	Form Factor	4.36" (H) x 10.5" (L) Dual slot card
	Graphics Controller	NVIDIA Quadro FX 4800 graphics board
	Bus Type	PCI Express x16, Generation 2.0
	Memory	1.5 GB GDDR3 SDRAM unified graphics memory
	Connectors	2 DisplayPort, 1 Dual-Link DVI-I, 1 3-pin Mini DIN stereo output, Two DisplayPort to DVI-D adapters included ('DisplayPort to VGA' and 'DisplayPort to Dual Link DVI' adapters available as an accessory)
	Maximum Resolution	• 2 DisplayPort connectors support ultra-high-resolution panels (up to 2560 x 1600) • Dual-link DVI-I output drives one digital display at resolutions up to 2560 x 1600 @ 60Hz • Internal 400 MHz DACs-One analog display up to 2048 x 1536 @ 85Hz
	Shading Architecture	• Full Shader Model 4.0 (OpenGL 2.1/DirectX 10 class) • Long fragment programs (unlimited instructions) • Long vertex programs (unlimited instructions) • Looping and subroutines (up to 256 loops per vertex program) • Dynamic flow control • Conditional execution
	Supported Graphics APIs	OpenGL 3.0 Direct X 10.0
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS4 & 5 Desktop/Workstation Qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution AntiAliasing	• Rotated Grid Full-Scene Antialiasing (RG FSAA) • 32xFSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920 x 1200 • 64x FSAA SLI Mode
	High-level Shader Languages	• Optimized compiler for Cg and Microsoft HLSL • OpenGL 2.1 and DirectX 10 support • Open source compiler
	Power consumption	146 Watts

NVIDIA Quadro FX 5600 PCIe Graphics Card	Graphics Controller	NVIDIA Quadro FX 5600 graphics card
	Bus Type	PCI Express x16
	Memory	1.5 GB GDDR3 SDRAM unified graphics memory
	Connectors	2 Dual-Link DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	Maximum Resolution	2560x1600 @ 60Hz
	RAMDAC	Dual 400 MHz integrated

Technical Specifications - Graphics

Image Quality Features	12-bit subpixel sampling precision enhances AA quality Rotated-grid full-scene antialiasing (RG FSAA) 32x FSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920x1200
Avivo Video and Display Platform	nView Architecture - Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows®
Display Output	Dual dual-link DVI-I outputs support two digital displays at up to 2560x1600 @ 60Hz Internal 400 MHz DACs - Two analog displays up to 2560x1600 @ 60Hz
Shading Architecture	Fully programmable GPU (OpenGL 2.1/DirectX 10 class) Long fragment programs (unlimited instructions) Long vertex programs (unlimited instructions) Looping and subroutines (up to 256 loops per vertex program) Dynamic flow control Conditional execution
Supported Graphics APIs	OpenGL 2.1 ICD with immediate mode support for all OGL primitive types DirectX 10
Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS3, WS4 & 5 Desktop/Workstation HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
High-Resolution Antialiasing	The NVIDIA Quadro FX 5600 Architecture includes: 128-bit color precision Unlimited fragment instruction Unlimited vertex instruction 3D volumetric texture support Single-system powerwall 12 pixels per clock rendering engine Hardware accelerated antialiased points & lines Hardware OpenGL overlay planes Hardware accelerated two-sided lighting Hardware accelerated clipping planes 3rd-generation occlusion culling 16 textures per pixel in fragment programs Window ID clipping functionality Hardware accelerated line stippling
High-level Shader Languages	Optimized compiler for Cg and Microsoft® HLSL OpenGL 2.1 and DirectX 10 support Open source compiler

Technical Specifications - Graphics

NVIDIA Quadro FX 5800 4GB Graphics Card	Form Factor	4.36" (H) x 10.5" (L), Dual Slot
	Graphics Controller	NVIDIA Quadro FX 5800 Graphics Board
	Bus Type	PCI Express x16, Generation 2.0
	Memory	4GB GDDR3 SDRAM unified graphics memory
	Connectors	2 Dual-Link DVI-I, 1 DisplayPort, 1 3-pin Mini DIN stereo output Two DVI to VGA adapters included ('DisplayPort to VGA' and 'DisplayPort to Dual Link DVI' adapters available as an accessory)
	Maximum Resolution	• Two dual-link DVI-I outputs drive two digital displays at resolutions up to 2560 x 1600 @ 60Hz • One DisplayPort output drives an ultra-high-resolution panel (up to 2560 x 1600) • Internal 400 MHz DACs-Two analog displays up to 2048 x 1536 @ 85Hz
	Shading Architecture	• Full Shader Model 4.0 (OpenGL 2.1/DirectX 10 class) • Long fragment programs (unlimited instructions) • Long vertex programs (unlimited instructions) • Looping and subroutines (up to 256 loops per vertex program) • Dynamic flow control • Conditional execution
	Supported Graphics APIs	OpenGL 3.0 Direct X 10.0
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) WS4 & 5 Desktop/Workstation HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html Novell SUSE Linux Enterprise drivers may be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	High-Resolution AntiAliasing	• Rotated Grid Full-Scene Antialiasing (RG FSAA) • 32x FSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920x1200
	High-level Shader Languages	• Optimized compiler for Cg and Microsoft HLSL • OpenGL 2.1 and DirectX 10 support • Open source compiler
	CUDA™ Parallel Processor Cores	240
	Power consumption	225 Watts

Technical Specifications - Graphics

NVIDIA Quadro CX	Form Factor	4.36" (H) x 10.5" (L) Dual slot card
	Graphics Controller	NVIDIA Quadro CX 1.5GB Graphics Card
	Bus Type	PCI Express x16, Generation 2.0
	Memory	1.5 GB GDDR3 SDRAM unified graphics memory
	Connectors	2 DisplayPort, 1 Dual-Link DVI-I, 1 3-pin Mini DIN stereo output. Two DisplayPort to DVI-D adapters included ('DisplayPort to VGA' and 'DisplayPort to Dual Link DVI' adapters available as an accessory)
	Maximum Resolution	• 2 DisplayPort connectors support ultra-high-resolution panels (up to 2560 x 1600) • Dual-link DVI-I output drives one digital display at resolutions up to 2560 x 1600 @ 60Hz • Internal 400 MHz DACs-One analog display up to 2048 x 1536 @ 85Hz
	RAMDAC	400MHz
	Shading Architecture	• Full Shader Model 4.0 (OpenGL 2.1/DirectX 10 class) • Long fragment programs (unlimited instructions) • Long vertex programs (unlimited instructions) • Looping and subroutines (up to 256 loops per vertex program) • Dynamic flow control • Conditional execution
	Supported Graphics APIs	OpenGL 2.1 Direct X 10.0
	Available Graphics Drivers	Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html
	High-Resolution AntiAliasing	• Rotated Grid Full-Scene Antialiasing (RG FSAA) • 32xFSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920 x 1200 • 64x FSAA SLI Mode
	High-level Shader Languages	• Optimized compiler for Cg and Microsoft HLSL • OpenGL 2.1 and DirectX 10 support • Open source compiler
	Power consumption	146 Watts

Technical Specifications - Graphics

ATI FireGL V7700 512MB PCIe Graphics Card	Form Factor	ATX
	Graphics Controller	RV670
	Bus Type	PCI Express x16 (PCI 2.0)
	Memory	512 MB unified frame buffer, Z-buffer and Texture storage and a 256-bit Ring-Bus memory controller
	Connectors	One DisplayPort Output One dual-link DVI connector One stereo 3D Output
	Maximum Resolution	Dual Link digital support for 2560 x 1600 @ 60Hz. Ideal for 30-inch widescreen displays.
	RAMDAC	Dual 10-bit per channel 400MHz
	Ring Bus Memory Controller	512-bit internal ring bus for highly efficient memory reads Programmable intelligent arbitration logic
	Display Output	Up to 16-bit per RGB color component High Dynamic Range output (HDR) Programmable piecewise linear gamma correction, color correction, and color space conversion (10-bits per color)
	Shading Architecture	Supports Full Shader Model 4.0 320 shader processing unit
	Supported Graphics APIs	DirectX 10.1 and OpenGL 2.1 advanced
	Available Graphics Drivers	Microsoft Windows Vista 32 and 64, Microsoft Windows XP HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html.
	Option kit contents	PCA with ATX bracket, DVI to VGA converters, CD and manual.

HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations	450GB SAS 15K rpm 3Gb/s 3.5" HDD	Capacity	450 GB	
		Height	1 in; 2.5 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4 in; 10.2 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.2 ms
			Average	3.6 ms
			Full Stroke	6.6 ms
		Rotational Speed	15,000 rpm	
		Logical Blocks	879,097,968 - 512 byte blocks	
		Operating Temperature	50° to 95° F (10° to 35° C)	
	300GB SAS 15K rpm 3Gb/s 3.5" HDD	Capacity	300 GB	
		Height	1 in; 2.5 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4 in; 10.2 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.2 ms
			Average	3.5 ms
			Full Stroke	6.7 ms
		Rotational Speed	15,000 rpm	
		Logical Blocks	585,937,500 - 512 byte blocks	
		Operating Temperature	50 to 95 F (10 to 35 C)	
	146GB SAS 15K rpm 3Gb/s 3.5" HDD	Capacity	146 GB	
		Height	1 in; 2.5 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4 in; 10.2 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	16 MB	

	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.2 ms
		Average	3.5 ms
		Full Stroke	6.7 ms
	Rotational Speed	15,000 rpm	
	Logical Blocks	86,749,488 - 512 byte blocks	
	Operating Temperature	50 to 95 F (10 to 35 C)	
73 GB SAS 15K rpm 3Gb/s HDD	**Capacity**	73 GB	
	Height	1 in; 2.5 cm	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	SAS	
	Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
	Buffer	16 Mbytes	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.2 ms
		Average	3.5 ms
		Full Stroke	6.7 ms
	Rotational Speed	15,000 rpm	
	Logical Blocks	143,374,738 - 512 byte blocks	
	Operating Temperature	50 to 95 F (10 to 35 C)	
146 GB SAS 10K rpm SFF HDD	**Capacity**	146 GB	
	Height	0.583 in; 1.5 cm	
	Width	**Media Diameter**	2.5 in; 6.36 cm
		Physical Size	2.76 in; 7 cm
	Interface	SAS	
	Synchronous Transfer Rate (Maximum)	1.5 Gb/s	
	Buffer	16 Mbytes	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.4 ms
		Average	<4.0 ms
		Full Stroke	<8.2 ms
	Rotational Speed	10,000 rpm	
	Logical Blocks	286,749,488 - 512 byte blocks	
	Operating Temperature	50 to 95 F (10 to 35 C)	
73 GB SAS 10K rpm SFF	**Capacity**	73 GB	
	Height	0.583 in; 1.5 cm	

	HDD	Width	Media Diameter	2.5 in; 6.36 cm
			Physical Size	2.76 in; 7 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	1.5 Gb/s	
		Buffer	16 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.4 ms
			Average	4.0 ms
			Full Stroke	8.2 ms
		Rotational Speed	10,000 rpm	
		Logical Blocks	143,374,738 - 512 byte blocks	
		Operating Temperature	50 to 95 F (10 to 35 C)	
SATA (Serial ATA) Hard Drives for HP Workstations	300GB SATA 10K rpm SFF in 3.5" Frame HDD	Capacity	300,069,052,416 bytes	
		Height	1 in; 2.54 cm	
		Width	Media Diameter	2.5 in; 6.36 cm
			Physical Size	4 in; 10.17 cm
		Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
		Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
		Cache	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
			Average	4.4 ms
			Full Stroke	9.5 ms
		Rotational Speed	10,000 rpm	
		Logical Blocks	586,072,368	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	160GB SATA 10K rpm SFF in 3.5" Frame HDD	Capacity	160,041,885,696 bytes	
		Height	1 in; 2.5 cm	
		Width	Media Diameter	2.5 in; 6.36 cm
			Physical Size	4 in; 10.2 cm
		Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
		Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
			Average	4.4 ms
			Full Stroke	9.5 ms
		Rotational Speed	10,000 rpm	

	Logical Blocks	312,581,808	
	Operating Temperature	41° to 131° F (5° to 55° C)	
80GB SATA 10K rpm SFF in 3.5" Frame HDD	Capacity	80,026,361,856 bytes	
	Height	1 in; 2.5 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Buffer	16 Mbytes	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms (maximum)
		Average	4.4 ms
		Full Stroke	19.5 ms
	Rotational Speed	10,000 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 131° F (5° to 55° C)	
1000GB (1TB) SATA 7200 rpm 3.0Gb/s 3.5" HDD	Capacity	1,000,204,886,016 bytes	
	Height	1 in; 2.5 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	Up to 300 MB/s	
	Buffer	32 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
500GB SATA 7200 rpm 3Gb/s 3.5" HDD	Capacity	500,107,862,016 bytes	
	Height	1 in; 2.5 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	16 MB	

	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
250GB SATA 7200 rpm 3Gb/s 3.5" HDD (for HP xw-Workstations)	**Capacity**	250,059,350,016 bytes	
	Height	1 in; 2.5 cm	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
160GB SATA 7200 rpm 3Gb/s 3.5" HDD	**Capacity**	160,041,885,696 bytes	
	Height	1 in; 2.5 cm	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (3.0 Gb/s), Native Command Queuing enabled	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 131° F (5° to 55° C)	
80GB SATA 7200 rpm	**Capacity**	80,026,361,856 bytes	
	Height	1 in; 2.5 cm	

Technical Specifications - Hard Drives

3Gb/s 3.5" HDD	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4 in; 10.2 cm
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	300 MB/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 131° F (5° to 55° C)	

Integrated LSI SAS 1068E Controller with RAID 0, 1, 1E/10E	PCI Bus	PCI-Express x8 lanes
	PCI Modes	Bus Master DMA
	RAID Levels	RAID 0, 1, 1E and 10E
	PCI Data Burst Transfer Rate	8 PCI-Express lanes at 2.5Gbps in each direction for a total bandwidth of 5.0Gbps for each full duplex lane. Total aggregate bandwidth of up to 4GBps possible.
	Full Duplex	LSI's SAS1068E 8-port SAS/SATA controller supports 1.5 and 3.0Gb/s per port data transfer rates.
	PCI Card Type	N/A
	PCI Voltage	N/A
	PCI Power	N/A
	Bracket	N/A
	Certification Level	PCI-Express 1.0a
	IO Bus	Eight 3Gb/s SAS/SATA ports
	SAS Processor	LSISAS1068E
	Internal Connectors	Four- SATA x1 connectors
	External Connectors	None
	Maximum Number of SCSI Devices	32
	LED Indicators	On-board activity and fault LEDs
	Integrated Mirroring	Integrated Mirroring option available

LSI MegaRAID® SAS 8888ELP Host Bus Adapter (HBA)	PCI Bus	PCI-Express x8 lanes
	PCI Modes	Bus Master DMA
	RAID Levels	RAID 0, 1, and 5 RAID spans 10 and 50
	PCI Data Burst Transfer Rate	Up to 3Gb/s per port
	Full Duplex	Up to 1.5 GB/s
	PCI Voltage	+3.3V Add-in Card
	PCI Power	7.5 Watts
	Certification Level	PCI-Express 1.0a
	IO Bus	Eight 3Gb/s SAS/SATA ports
	Internal Connectors	Two SAS SFF8087 x4
	External Connectors	Two SAS SFF8088 x4
	Maximum Number of SCSI DeviceS	32
	LED Indicators	Connector LEDs indicate whether the internal or external connector is active for ports 0-3 and 4-7

Technical Specifications - Multimedia and Audio Devices

Integrated Intel/Realtek HD ALC262 Audio	Type	Integrated
	High Definition Codec	Yes
	FM Synthesis Support	Yes
	OPL3 FM Synthesis Support	Yes
	Sound Blaster Compatibility	Yes
	Meets Premium performance for Windows Logo Program 3.0	Yes
	Audio Jacks	Front panel microphone in and headphone out - fixed usage. Rear panel line in and line out jacks - jacks are retaskable One Line-In* (12-K ohm Input Impedance)* NOTE: External Speakers need to be powered externally.
	Sampling	3 stereo ADCs support 16/20-bit PCM format with 44.1K/48K/96kHz sample rate 2 stereo DAC supports 16/20/24-bit PCM format with 44.1K/48K/96K/192kHz sample rate
	Wavetable Syntheses (software)	Yes – GM and FM Midi Support, Direct Music and Down Loadable Soundset (4 Meg DLS Level 1 and 2 Support)
	3D Positional Sound	No
	Digital Audio	Yes
	Analog Audio	Yes
	DVD Audio	Yes
	Number of Channels on Line-Out	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
	Internal Speaker	Yes
	Hardware Equalizer for Internal Speaker	No
	External Speaker Jack (Line-Out)	Yes

Technical Specifications - Multimedia and Audio Devices

SoundBlaster X-Fi XtremeGamer Audio Card (PCI)	24-bit Analog-to-Digital conversion of analog inputs	96kHz sample rate
	24-bit Digital-to-Analog conversion of digital sources	96kHz to analog 7:1 speaker output
	24-bit Digital-to-Analog conversion of stereo digital sources	8, 11.025, 16, 22.05, 24, 32, 44.1, 48 and 96kHz
	16-bit to 24-bit recording sampling rates	16-bit/44.1kHz, 16-bit/48kHz, 24-bit/44.1kHz, 24-bit/48kHz and 24-bit/96kHz with direct monitoring
	Enhanced SoundFont support	Up to 24-bit resolution
	Signal-to-Noise Ratio (2okHz Low-pass filter, A-Weighted)	Stereo Output 109dB Front and Rear Channels 109dB Center, Subwoofer and Side Channels 109dB
	Total Harmonic Distortion + Noise at 1kHz (20kHz Low-pass filter)	0.004%
	Frequency Response (-3dB, 24-bit/96kHz input)	10Hz to 46kHz
	Frequency Response (-3dB, 24-bit/192kHz input)	10Hz to 46kHz
	Speaker and Headphone connections	Stereo to 7.1 (Line Out via three 3.5mm mini jacks)
	Flexijack	Line In/ Microphone In/Optical Outi via shared 3.5mm mini jack
	Auxiliary Line Level Input	4-pin molex connector
	Front Panel Header	Intel HD Audio Compatible (1x10 pin)
	Operating System	EntMicrosoft Windows Vista Business 64 Microsoft Windows Vista Business 32 Microsoft® Windows® XP Professional SP2 Microsoft Windows XP Professional x64 Edition

Technical Specifications - Optical and Removable Storage

HP DVD+/-RW Drive	Description	5.25-inch, half-height, tray-load		
	Mounting Orientation	Either horizontal or vertical		
	Interface Type	SATA/ATAPI		
	Dimensions (WxHxD)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	Disc Formats	DVD-RAM DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW		
	Disc Capacity	DVD-ROM	8.5 GB DL or 4.7 GB standard	
		Full Stroke DVD	< 250 ms (seek)	
		Full Stroke CD	< 210 ms (seek)	
	Maximum Data Transfer Rates	CD ROM Read	CD-ROM, CD-R Up to 40X CD-RW Up to 32X	
		DVD ROM Read	DVD-RAM	Up to 12X
			DVD+RW	Up to 8X
			DVD-RW	Up to 8X
			DVD+R DL	Up to 8X
			DVD-R DL	Up to 8X
			DVD-ROM	Up to 16X
			DVD-ROM DL	Up to 8X
			DVD+R	Up to 16X
			DVD-R	Up to 16X
	Power	Source	SATA DC power receptacle	
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
		DC Current	5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum	
	Operating Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)	
		Relative Humidity	10% to 90%	
		Maximum Wet Bulb Temperature	86° F (30° C)	
		Operating Systems Supported	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Enterprise Linux(RHEL) WS3, WS4, 5 Desktop/Workstation Novell SLES 9 & SLE 10 No driver is required for this device. Native	

			support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements. * LightScribe functionality is not natively supported by Linux distributions. Customers may download LightScribe Linux drivers from: http://www.lightscribe.com/downloadSection/linux/index.aspx
	Kit Contents		HP SATA SuperMulti LightScribe DVD Writer drive, LightScribe software, Roxio Easy Media Creator software, Intervideo WinDVD Software, installation guide, and DVD+R media.
HP DVD-ROM Drive	Description		5.25-inch, half-height, tray-load
	Mounting Orientation		Either horizontal or vertical
	Interface Type		SATA/ATAPI
	Dimensions (WxHxD)		5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)
	Disc Capacity	DVD-ROM	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	Access Times	DVD-ROM Single Layer	< 140 ms (typical)
		CD-ROM Mode 1	< 125 ms (typical)
		Full Stroke DVD	< 250 ms (seek)
		Full Stroke CD	< 210 ms (seek)
	Power	Source	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC - < 600 mA typical, < 1400 mA maximum
	Operating Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)
		Operating Systems Supported	Windows Vista Business 64* Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*.

Red Hat Enterprise Linux(RHEL) WS3, WS4, 5 Desktop/Workstation
Novell SLES 9 & SLE 10
No driver is required for this device. Native support is provided by the operating system.

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Technical Specifications - Networking and Communications

Intel Pro 1000 PT PCIe Gigabit NIC Card	Connector	RJ-45
	Controller	Intel 82572EI Gigabit Ethernet Controller
	Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers
	Data Rates Supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus Architecture	PCI-E 1.0a
	Data Path Width	X1, 250 MB/s, Bi-directional interface
	Data Transfer Mode	Bus-master DMA
	Hardware Certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power Requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T
	Boot ROM Support	Yes
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Operating Temperature	32° to 131°F (0° to 55° C)
	Operating Humidity	85% at 131° F (55° C)
	Dimensions	6.4 x 2.6 x 0.8 in (16.3 x 6.6 x 1.9 cm)
	Operating System Driver Support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Enterprise Linux(RHEL) WS4, 5 Desktop/Workstation Novell SLES 9 & SLE 10 No driver is required for this device. Native support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.
	Management Capabilities	ASF, WOL , PXE, DMI, WFM 2.0
	Kit Contents	Intel Pro 1000 PT PCIe Gigabit NIC Card , low profile bracket, CD containing Intel PROset II NIC drivers, quick install guide, product warranty statement.

Technical Specifications - Networking and Communications

Broadcom 5751 NetXtreme Gigabit Ethernet PCIe NIC	Connector	RJ-45
	Controller	Broadcom 5751 PCI-Express LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data Rates Supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus Architecture	PCI-E
	Data Path Width	Single channel, PCI-E
	Data Transfer Mode	Bus-master DMA
	Hardware Certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power Requirement	3.1 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Operating Temperature	32° to 131°F (0° to 55° C)
	Operating Humidity	85% at 131° F (55° C)
	Dimensions	4.4 x 2.2 x 0.08 in (11.2 x 5.5 x 2 cm)
	Operating System Driver Support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Enterprise Linux(RHEL) WS3, WS4, 5 Desktop/Workstation Novell SLES 9 & SLE 10 No driver is required for this device. Native support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.
	Management Capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
	Kit Contents	Broadcom 5751, CD, Broadcom 5751 Netxtreme Gigabit PCIe NIC, drivers, quick install guide, product warranty statement

HP xw8/94 SAS Back Panel Connector Kit	Dimensions (HxD)	Plug only 0.55 x 1.54 x 2.24 in (14 x 39 x 57 mm)
	Ports	4 SATA, 1 MiniSAS 4x
HP FireWire® 800 IEEE-1394b 3-Port PCI Card	Data Transfer Rate	Supports up to 800 Mb/s
	Devices Supported	IEEE-1394 compliant devices
	Bus Type	PCI card with brackets for low profile and full height PCI slots
	Ports	Two IEEE-1394b bilingual 9-Pin Connectors (Rear)
	Internal Connectors	One 10-Pin header Custom Connector
	System Requirements	Microsoft® Windows® XP Professional, Windows XP Home Not supported on Linux. Pentium® III or higher processor 128 MB RAM 1 GB Hard Drive CD-ROM drive Built-in sound system Available PCI slot
	Temperature - Operating	50° to 131° F (10° to 55° C)
	Temperature - Storage	-22° to 140° F (-30° to 60° C)
	Relative Humidity - Operating	20% to 80%
	Compliances	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwan BSMI CNS13438, Korea MIC
	Operating Systems Supported	Microsoft Windows XP Only
HP FireWire/IEEE 1394a PCI Card	Data Transfer Rate	Burst Data Rate up to 400 Mbps
	Device Interface Protocol	IEEE-1394a
	Devices Supported	IEEE-1394 compliant devices
	Bus Type	PCI card with brackets for low profile and full height PCI slots.
	Certification Level	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwan BSMI CNS13438, Korea MIC
	Ports	Two IEEE 1394 6-Pin Connector (Rear)
	Internal Connectors	One 10-Pin (9 Contacts) Custom Connector
	System Requirements	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. No driver is required for this device. Native support is provided by the operating system. * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.

	Pentium II 266 or above 128-MB RAM 1-GB Hard Drive CD-ROM drive Built-in sound system Available PCI slot
Temperature - Operating	50° to 131° F (10° to 55° C)
Temperature - Storage	-22° to 140° F (-30° to 60° C)
Relative Humidity - Operating	20% to 80%
Operating Systems Supported	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32* * Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.