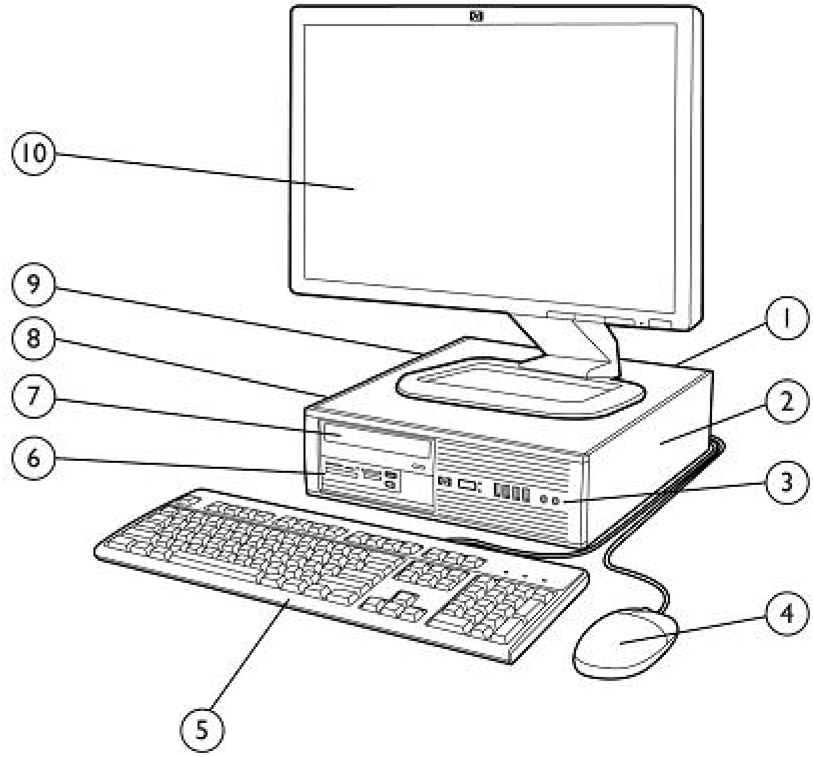
Small Form Factor



1. Rear I/O includes (6) USB 2.0 ports, serial port, PS/2 mouse and keyboard ports, RJ-45 network interface, DisplayPort and VGA video interfaces, and audio in/out jacks

2. Low profile expansion slots include (1) PCI slot, (1) PCI Express x1 slots and (2) PCI Express x16 graphics slot

NOTE: 2nd PCIe x16 slot has x4 connectivity.

3. Front I/O includes (4) USB 2.0 ports, dedicated headphone output, and a microphone/headphone jack

4. HP Optical Mouse

5. HP Keyboard

6. 3.5” external drive bay supporting a media card reader or a secondary hard disk drive

7. 5.25” external drive bay supporting an optical disk drive

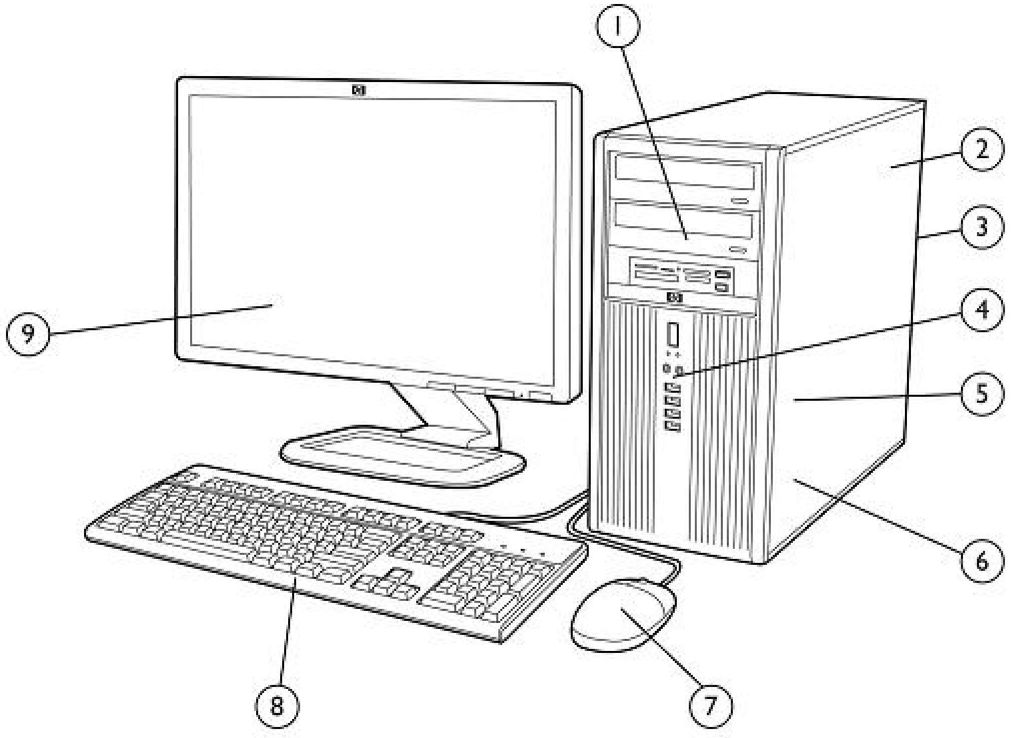
8. 3.5” internal drive bay supporting primary hard disk drive

9. 240W standard or high efficiency Power Supply

10. HP Monitor (sold separately)

Overview

Convertible Minitower



1. (3) 5.25"external drive bays supporting optical disk drives, removable hard disk drives, or the HP Media Card Reader

2. 320W standard or high efficiency Power Supply

3. Rear I/O includes (6) USB 2.0 ports, serial port, PS/2 mouse and keyboard ports, RJ-45 network interface, DisplayPort and VGA video interfaces, and audio in/out jacks

4. Front I/O includes (4) USB 2.0 ports, dedicated headphone output, and a microphone/headphone jack

5. (3) 3.5" internal drive bays supporting multiple hard disk drives

6. Full height expansion slots include (3) full-length PCI slots, (1) PCI Express x1 slot, and (2) full-length PCI Express x16 graphics slots
NOTE: 2nd PCIe x16 slot has x4 connectivity.

7. HP Optical Mouse

8. HP Keyboard

9. HP Monitor (sold separately)

Overview

At A Glance

- Designed for long-term deployment within medium to large commercial and institutional organizations
- Guaranteed lengthy purchase lifecycles and image stability
- Standard efficiency or 89% high efficiency energy saving power supplies; high efficiency power supplies certified 80 PLUS® Gold by Ecos Consulting
- ENERGY STAR qualified models available; all ENERGY STAR qualified models are certified EPEAT Gold
- Intel® Q57 Express chipset
- Intel® Core™ and Pentium® processors
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Software image fully compatible across all models and form factors
- BIOS developed and engineered by HP for better security, manageability and software image stability
- Integrated dual independent monitor support via both a VGA and DisplayPort video/audio interface
- Created using industry leading Design for Environment standards
- Intel® Core™ Processor with vPro™ Technology (on select models)
- Supports industry standard management protocols including DASH and Intel® Standard Manageability
- Models can be configured with multiple hard disk drives in a RAID array
- Selected configurations with global availability easily set up and ordered through HP.com Business to Business portals (http://h10019.www1.hp.com/business-site/index.html)
- Tailored HP Factory Express deployment and lifecycle services available (http://h71028.www7.hp.com/enterprise/cache/97688-0-0-225-121.aspx)
- Protected by HP Services, including standard warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability features for easier upgrades and repairs
- Choice of professional chassis form factors to accommodate the desired mix between expandability and size
- HP unique Convertible Minitower chassis delivers true expandability, and is easily configured for vertical or horizontal orientation

Operating Systems

Preinstalled	• Genuine Windows Vista Business (32-bit)[1] • Genuine Windows Vista Home Basic (32-bit)1 • Genuine Windows 7 Professional Edition (32-bit)[2] • Genuine Windows 7 Professional Edition (64-bit)[2] • Genuine Windows XP Professional (available through downgrade rights from Genuine Windows 7 Professional) [2,3] • Genuine Windows 7 Home Premium Edition (32-bit or 64-bit)[2] • Genuine Windows 7 Home Basic Edition (32-bit)[2] • FreeDOS
Supported	• Genuine Windows Vista Enterprise Edition[1] • Genuine Windows 7 Enterprise Edition[2] • Genuine Windows 7 Ultimate Edition[2] • Novell SUSE Linux Enterprise Desktop 114
Certified	• Red Hat Desktop RHEL[4]

[1] Certain Windows Vista product features require advanced or additional hardware. See www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and 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: www.windowsvista.com/upgradeadvisor

[2] System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

[3] Windows 7 Professional disk may be 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.

[4] The following features are not supported on Linux certified systems:

- HP 22-in-1 media card reader
- Trusted Platform Module (TPM) 1.2 Security Chip
- Intel Gigabit CT Desktop NIC Card
- Broadcom NetXtreme GbE Ethernet Plus NIC
- HP 802.11b/g/n wireless NIC
- LSI 56K Int'l SoftModem
- HP USB Smartcard keyboard
- HP Serial port adapter
- HP Parallel port adapter
- HP eSATA port adapter
- HP FireWire/IEEE 1394 I/O card
- RAID
- Media Card Reader (22-in-1) with 1394 port
- NVIDIA NVS G310 SH Graphics Card

Standard Features and Configurable Components (availability may vary by country)

- NVIDIA Quadro NVS 290 Graphics Card
- NVIDIA Quadro NVS 295 Graphics Card
- ATI Radeon HD 4550 Graphics Card
- ATI Radeon HD 4650 DP Graphics Card

Value Added Software (included with all models; not included when configured with FreeDOS)

- HP ProtectTools Security Suite
- HP Software Management Agent
- Computrace for Desktops agent (optional)*
- HP Insight Diagnostics
- PDF Complete

* Computrace available as an optional aftermarket service; separate software and subscription are required

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Value Added Software (included with select models; not included when configured with FreeDOS)

- Computer Setup Utility
- McAfee Total Protection Anti-Virus*
- Roxio Creator Business
- HP Power Assistant
- Microsoft Office Trial Version
- Mozilla Firefox for HP Virtual Browser
- Corel WinDVD

* 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter

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HP Client Management Solutions (available for free download from the Internet)

http://www.hp.com/go/easydeploy)

- HP Client Automation Starter*
- HP SoftPaq Download Manager
- HP Client Catalog for Microsoft SMS
- HP Systems Software Manag

* Available from your HP Sales Representative or HP Channel Partner

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Value Added Services and Features

- HP Stable Platform Program
- Intel Stable Platform Program
- Business-to-Business Portals
- HP Global Series Services
- Factory Express Deployment and Lifecycle Services
- Intel Standard Manageability
- Intel® Core™ processor with vPro™ technology
- Trusted Platform Module (TPM) v1.2
  TPM module disabled where restricted by law; for example, Russia.

Service and Support

On-site warranty and service[1]: three year (3/3/3) limited warranty and service offering delivers three years of parts, labor and on-site repair. Response time is next business day[2] and includes free telephone support[3] 24 x 7. Global coverage[2] ensures any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor.

[1] Terms and conditions may vary by country. Certain restrictions and exclusions apply.

[2] On-site services 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.

Standard Features and Configurable Components (availability may vary by country)

[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.

Power Supply	Small Form Factor	Convertible Minitower
Standard Efficiency	240W active PFC	320W active PFC
High Efficiency*	240W active PFC 87/89/85% efficient at 20/50/100% load	320W active PFC 87/89/85% efficient at 20/50/100% load
Operating Voltage Range	90 – 264 VAC	90 – 264 VAC
Ports		
USB 2.0	Front – four (4) ports Rear – six (6) ports	
Serial	One port standard; second port available optionally	
Parallel	One port available optionally	
eSATA	One port available optionally	
PS/2	Color coded support for keyboard (purple) and mouse (green)	
Video	VGA and DisplayPort provide integrated dual independent monitor support	
DVI output	Available via optional DisplayPort to DVI Adapter	
Audio	Front – microphone & headphone Rear – line input (supports microphone or line input), line out NOTE: See Audio/Visual section for information on re-taskable audio ports. DisplayPort also supports audio.	
NIC	Industry standard RJ-45 port accesses the integrated network interface controller	
Slots		
Type and quantity	(1) PCI (1) PCI Express x1 (2) PCI Express x16	(3) PCI (1) PCI Express x1 (half-length) (2) PCI Express x16
Slot specifications	Low Profile 25W max. cards	Full height 75W max. for cards in both x16 slots Primary x16 slot supports 75W or 35W card Secondary x16 slot supports 35W card when primary slot is limited to 35W card Secondary slot functions electrically as an x4 slot

Chipset

Intel Q57 Express supporting Intel® Core™ processor with vPro™ technology

Processors

NOTE: all models configured with Intel® Core™ processors with 4 cores require a discrete graphics solution

Intel Pentium Processors:

Intel Pentium G6950 Processor
2.80 GHz, 3M total cache
2 cores/2 threads
Integrated Intel® HD Graphics

Intel Core i3 Processors:

Standard Features and Configurable Components (availability may vary by country)

Intel Core i3-530 Processor
2.93 GHz, 4M total cache
2 cores/4 threads
Integrated Intel® HD Graphics

Intel Core i3-540 Processor
3.06 GHz, 4M total cache
2 cores/4 threads
Integrated Intel® HD Graphics

Intel Core i5 Processors:

Intel Core i5-650 Processor
3.2 GHz, 4M total cache
2 cores/4 threads
Integrated Intel® HD Graphics
Intel® Core™ processor with vPro™ technology
Intel® Stable Image Platform Program (SIPP)

Intel Core i5-660 Processor
3.33 GHz, 4M total cache
2 cores/4 threads
Integrated Intel® HD Graphics
Intel® Core™ processor with vPro™ technology
Intel® Stable Image Platform Program (SIPP)

Intel Core i5-670 Processor
3.46 GHz, 4M total cache
2 cores/4 threads
Integrated Intel® HD Graphics
Intel® Core™ processor with vPro™ technology
Intel® Stable Image Platform Program (SIPP)

Intel Core i5-750 Processor
2.66 GHz, 8M total cache
4 cores/4 threads
Requires a discrete graphics solution

Intel Core i5-750S (low power) Processor
2.40 GHz, 8M total cache
4 cores/4 threads
Requires a discrete graphics solution

Intel Core i7 Processors:

Intel Core i7-860 Processor
2.80 GHz, 8M total cache
4 cores/8 threads
Requires a discrete graphics solution
Intel® Core™ processor with vPro™ technology
Intel® Stable Image Platform Program (SIPP)

Intel Core i7-870 Processor
2.93 GHz, 8M total cache
4 cores/8 threads
Requires a discrete graphics solution
Intel® Core™ processor with vPro™ technology
Intel® Stable Image Platform Program (SIPP)

Redundant Array of Independent Drives (RAID)

- DriveLock is supported while in RAID mode. Users can manage the DriveLock password from within F10 Setup. Locked drives will be displayed as such in the RAID option ROM interface.
- Hard drive information can be viewed within F10 Setup while in RAID mode. Previously, the hard drives will not appear in Drive Configuration when switching to RAID mode.
- DPS Self Test can be executed on physical hard drives while in RAID mode.
- The RAID Setup Utility (accessed through CTRL-I) can be protected by the F10 Setup password.

NOTE: RAID 1 is the only RAID configuration offered via factory configurations. The pre-configured systems:

- *Are complete RAID systems and have both drives installed. If the CMT is configured with three hard disk drives, the third drive is would be unpartitioned and not part of the RAID array*
- *Have the necessary Option ROM configuration.*
- *Are pre-loaded and pre-installed with all required Intel software.*
- *Include a preinstalled operating system that is mirrored mode out of the box.*

Please refer to the HP White Paper titled "Advanced Host Controller Interface (AHCI) and Redundant Array of Independent Disks (RAID) on HP Compaq 8100 Elite Series PCs" at: http://www.hp.com for more information and instructions.

DDR3 Synchronous DRAM NON-ECC System Memory

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The HP Compaq 8100 Elite Series PC supports non-ECC DDR3 PC3-10600 (1333 MHz)* and PC3-8500 (1066 MHz)* memory.

CAUTION: You must shut down the computer and disconnect the power cord before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

Supports up to 16 GB of DDR3 SDRAM using DIMM modules. Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

Standard Features and Configurable Components (availability may vary by country)

Total Memory	Slot			
	Channel A		Channel B	
	1 (black)	2 (white)	3 (white)	4 (white)
1GB (single channel)	1 GB			
2 GB (dual channel)	1 GB		1 GB	
4 GB (dual channel)	1 GB	1 GB	1 GB	1 GB
8 GB (dual channel)	2 GB	2 GB	2 GB	2 GB
16 GB (dual channel)	4 GB	4 GB	4 GB	4 GB

* The Intel Q57 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the PC contains a single DIMM, 16 MB of memory is pre-allocated for it at system startup. If the PC contains two DIMMs, 32 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.

Memory Configurations

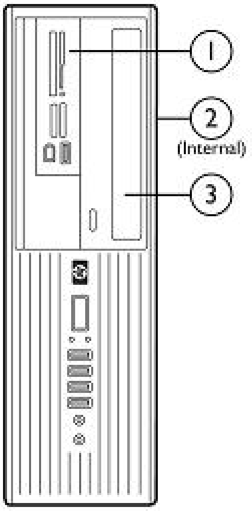
1GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (1 x 1GB)
2GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (1 x 2GB)
2GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (1 x 2GB)
3GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (1GB + 2GB)
4GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (1 x 4GB)
4GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (2 x 2GB)
8GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (2 x 4GB)
8GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (4 x 2GB)
16GB DDR3 SDRAM PC3-10600 (1333MHz) non ECC (4 x 4GB)

Expandability	Small Form Factor	Convertible Minitower
PCI slot	(1) slot Low profile (2.5”); Half length (6.6”) 25W max. power	(3) slots Full height (4.2”); Full length 25W max. power
PCI Express x16 slot	(2) slots Low profile (2.5”); Half length (6.6”) 25W max. power Secondary slot functions electrically as an x4 slot	Full height (4.2”); Full length 75W max. for cards in both x16 slots Primary x16 slot supports 75W or 35W card Secondary x16 slot supports 35W card when primary slot is limited to 35W card Secondary slot functions electrically as an x4 slot
PCI Express x1 slot	(1) slot Low profile (2.5”); Half length (6.6”) 10W max. power	(1) slot Half height; Half length 10W max. power
External Drive Bays		

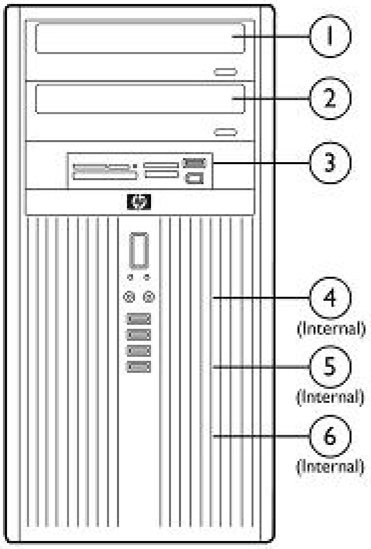
Standard Features and Configurable Components (availability may vary by country)

3.5"	(1) bay available for Media Card Reader unless used for a secondary hard drive	N/A NOTE: A 3.5"device can be used in 5.25" bay with an adapter.
5.25"	1 bay (8.19" depth)	3 bays Top two bays accept drives up to 8.19" depth Bottom bay accepts drives up to 5.7"depth
Internal Drive Bays	1 bay for primary hard disk drive A secondary HDD can be installed in 3.5" external bay if not used for an external device	3 bays for 3.5" hard disk drives 2.5" SSD can be installed with an adapter bracket
Hard Drive Controller	Serial ATA with support for SATA 1.5-Gb/s and 3.0-Gb/s hard drives	
SATA Interfaces	(4) Serial ATA interfaces NOTE: Three common SATA ports and one that can optionally be used for eSATA	(5) Serial ATA interfaces NOTE: Four common SATA ports and one that can optionally be used for eSATA
Host SATA Controller	Advanced Host Controller Interface (AHCI) Revision 1.2. The specification includes a description of the hardware/software interface between system software and the host controller hardware.	

Small Form Factor



Convertible Minitower



Storage – Drive Support						
	SFF			CMT		
	MCR	ODD	HDD SSD	MCR	ODD	HDD SSD
Quantity Supported	1	1	2	1	2	3
Position	1	3	2,1	3	1,2	4,5,6

Standard Features and Configurable Components (availability may vary by country)

Hard Disk Drives

160GB Hard Disk Drive
7,200 rpm, 8MB cache, 3.0 GB/s, 3.5" drive

160GB Hard Disk Drive
10,000 rpm, 16MB cache, 3.0 GB/s, 2.5" drive (includes 3.5" adapter)

160GB Removable Hard Disk Drive
7,200 rpm, 8MB cache, 3.0 GB/s

250GB Hard Disk Drive
7,200 rpm, 8MB cache, 3.0 GB/s, 3.5" drive

250GB Removable Hard Disk Drive
7,200 rpm, 8MB cache, 3.0 GB/s

320GB Hard Disk Drive
7,200 rpm, 8MB cache, 3.0 GB/s, 3.5" drive

500GB Hard Disk Drive
7,200 rpm, 16MB cache, 3.0 GB/s, 3.5" drive

1 TB Hard Disk Drive
7,200 rpm, 16MB cache, 3.0 GB/s, 3.5" drive

Solid State Drives

64GB Solid State Drive
2.5" drive (includes 3.5" adapter)

Optical Disc Drives (5.25")

DVD-ROM Drive[1]

SuperMulti LightScribe DVD Writer Drive[1,2,3]

Blu-Ray Writer Drive

[1] For playing DVDs, Corel WinDVD 8
[2] For writing CDs, choice of Sonic/Roxio Easy Media Creator 9 orRoxio Business Creator 10
[3] For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio Easy Media Creator 9 or Roxio Business Creator 10

Media Card Readers

Media Card Reader (22-in-1)

Media Card Reader (22-in-1) with 1394 port

Standard Features and Configurable Components (availability may vary by country)

Security

Trusted Platform Module (TPM) 1.2[1]

Stringent Security (via BIOS)[2]

SATA Port Disablement (via BIOS)

Drive Lock

RAID Configurations

HP ProtectTools security software

Serial, Parallel, USB enable/disable (via BIOS)

Optional USB Port Disable at factory (user configurable via BIOS)

Removable Media Write/Boot Control

Power-On Password (via BIOS)

Setup Password (via BIOS)

Solenoid Hood Lock / Sensor

Support for chassis padlocks and cable lock devices

[1] TPM module disabled where use is restricted by law; for example, Russia.

[2] This setting is defaulted to disable, but when enabled, the PW jumper will not clear the BIOS pre-boot authentication passwords.

Network Interface Connection

Intel 82578 GbE Network Connection (integrated)

Intel Gigabit CT Desktop NIC Card

Broadcom NetXtreme GbE Ethernet Plus NIC (PCIe x1)

NOTE: The integrated network connection is required to support the vPro Technology features.

HP 802.11 b/g/n Wireless NIC (PCIe x1)

NOTE: These wireless network interface solutions will disable the vPro Technology features.

Modem

LSI Hi-Speed 56K International Soft Modem (PCIe x1)

Graphics

Integrated graphics with Intel Pentium processor, Intel Core i3 processors, and select Intel Core i5 processors:

- Intel HD Graphics (integrated) on selected models

Available discrete graphics cards:

- NVIDIA GeForce 310 DP PCIe x16 Graphics Card
- Nvidia Quadro NVS 290 Graphics Card
- Nvidia Quadro NVS 295 Graphics Card
- ATI Radeon HD 4550 Graphics Card

Standard Features and Configurable Components (availability may vary by country)

ATI Radeon HD 4650 DP (1GB) PCIe x16 Graphics Card (CMT only)
HP ADD2 SDVO + DVI-D Video Adapter

HP DisplayPort to DVI-D Adapter
HP DisplayPort to VGA Adapter

Audio/Visual

High Definition Audio with Realtek ALC261 codec (all ports are stereo)
Microphone/Headphone* and dedicated headphone front ports
Line-out and Line-In rear Ports*
Multi-streaming capable*
Internal Speaker (standard)
HP Thin USB Powered Speakers
HP TV Tuner (Americas) PCIe x1 Card

* The front microphone port is re-taskable as a Line-in, Microphone-in or Headphone . Rear audio input ports are re-taskable as Line-in or Microphone-in. External speakers must be powered externally. Multistreaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks. This allows for different audio applications to use separate audio ports on the system. For example, the front jacks could be used with a headset for a communications application while the rear jacks are being used with external speakers and a multimedia application.

Input Devices

HP PS/2 Standard Keyboard
HP USB Standard Keyboard
HP USB SmartCard Keyboard
HP USB Mini Keyboard
HP USB & PS/2 Washable Keyboard

PS/2 Optical Scroll Mouse
USB Optical Scroll Mouse
USB Laser Scroll Mouse

Miscellaneous

HP FireWire (IEEE 1394) Card
HP Serial Port Adapter
HP Parallel Port Adapter
HP eSATA Port Adapter
HP Small Form Factor PC Tower Stand
Configure CMT in desktop orientation

After-Market Options (availability may vary by region)

Communications

	Part Number
HP Wireless 802.11 b/g/n NIC Card	FH971AA
Broadcom NetXtreme GbE Ethernet Plus NIC Card	FS215AA
Intel Gigabit CT Desktop NIC Card	FH969AA
LSI Hi-Speed 56K Int'l Soft Modem Card	FH970AA
RJ11 Modem Adapter Kit	DC131C

NOTE: The use of a NIC Card (wired or wireless) will disable the vPro Technology features.

Graphics

	Part Number
ATI Radeon HD 4550 Graphics Card	AT042AA
ATI Radeon HD 4650 DP (1GB) PCIe x16 Graphics Card	VN566AA
Nvidia Quadro NVS 290 Graphics Card	KG748AA
Nvidia Quadro NVS 295 Graphics Card	FY943AA
Nvidia GeForce 310 DP PCIe x16 Graphics Card	VG885AA

DMS59 DVI Dual-head Connector Cable	DL139A
HP DVI to DVI cable	DC198A
HP DisplayPort To DVI-D adapter	FH973AA
HP DisplayPort To DL DVI-D adapter	NR078AA
HP DisplayPort to VGA Adapter	AS615AA
HP DisplayPort Cable Kit	VN567AA

Hard Disk Drives

	Part Number
HP 160GB SATA NCQ SMART IV Hard Disk Drive	PY277AT
HP 250GB SATA NCQ SMART IV Hard Disk Drive	PY278AA
HP 500GB SATA NCQ SMART IV Hard Disk Drive	KW347AA
HP eSATA Adapter	FH966AA
HP Removable SATA Hard Drive Enclosure (frame & carrier)	RY102AA
HP Removable SATA Hard Drive Enclosure (Carrier Only)	RY103AA

After-Market Options (availability may vary by region)

Input/Output Devices

	Part Number
HP PS/2 Standard Keyboard	DT527A
HP USB Standard Keyboard	DT528A
HP USB Gray Keyboard	DT529A
HP 2.4GHz Wireless Keyboard & Mouse	NB896AA#xxx
HP USB Mini Keyboard	AS601AA
HP USB Washable Keyboard	VF097AA
HP PS/2 Optical Scroll Mouse	EY703AA
HP USB Optical Scroll Mouse	DC172B
HP USB Laser Mouse	GW405AA

DDR3 SDRAM System Memory

	Part Number
1 GB DIMM	AT023AA
2 GB DIMM	AT024AA
HP 4-GB PC3-10600 (DDR3-1333 MHz) DIMM	VH638AA

HP Monitors

	Part Number
HP L1506 15 TFT Flat Panel Monitor – Analog only	PX848AA
HP L1706 17 TFT Flat Panel Monitor – Analog only	PX849AA
HP L1740 17 LCD Flat Panel Display – Analog/Digital	PL766AA
HP L1745 17 TFT Flat Panel Display – Analog/Digital	GE178AA
HP L1906 19 TFT Flat Panel Display – Analog only	PX850AA
HP L1940T 19 TFT Flat Panel Display – Analog/Digital	EM869AA
HP LP1965 19 TFT Flat Panel Display – Analog/Digital	RA373AA
HP L2045w TFT Flat Panel Display – Analog/Digital	RD125AA
HP L2065 20 TFT Flat Panel Display – Analog/Digital	EF227A4
HP LP2465 24 TFT Widescreen Flat Panel Display – Analog/Digital	EF224A4
HP LP3045 30 TFT Flat Panel Display – Digital	EZ320A8
HP w19 Wide LCD Display – Analog/Digital	EM885AA
HP s7540 17 (16.0 vis) CRT Monitor	PF997AA

This is only representative, not an exhaustive list. All HP Monitors are supported except the 30-inch model. The 30-inch model can be added, but it requires a special graphics card.

After-Market Options (availability may vary by region)

Multimedia Devices

	Part Number
HP Thin USB Powered Speakers	KK912AA

DVD-ROM Drive	AR629AA
SuperMulti LightScribe Drive	AR630AA
Blu-Ray Writer Drive	AR482AA

Removable Media Storage

	Part Number
HP USB External Diskette Drive	DC141B
HP Media Card Reader (22-in-1)	AR941AA
HP Media Card Reader (22-in-1) with FireWire (IEEE 1394)	AR942AA

Security Devices

	Part Number
HP/Kensington MicroSaver Cable Lock	PC766A
HP Business PC Security Lock	PV606AA
HP (2009) SFF Wall Mount/Security Sleeve	VN570AA
HP (CMT) Solenoid Lock and Hood	DE618A
HP ProtectTools Version 5.0 (1 User) Software	VR893AA
HP USB SmartCard Keyboard	ED707AA

Software Solutions

	Part Number
HP Client Automation Standard	T3488AA (qty 1) TA599AA (qty 10) TA600AA (qty 100) TA601AA (qty 500) T3489AA (qty 1000)

Stands and Accessories

	Part Number
HP (2009) SFF Tower Stand	VN568AA
HP Serial Port Adapter	PA716A
HP Parallel Port Adapter	KD061AA
HP 5.25” Blank Bezel Kit (50 pack)	DC177B
HP FireWire (IEEE 1394) Card	PA997A

Technical Specifications

	Small Form Factor	Convertible Minitower
Dimensions		
Chassis (H x W x D)	3.95 x 13.30 x 14.9 in 100 x 338 x 378.5 mm	17.63 x 7.00 x 17.5 in 447.8 x 177.8 x 444.5 mm
System Volume	790.26 cu in 12.95 L	2160 cu in 35.4 L
Tower Stand (H x W x D)	1.12 x 7.01 x 7.87 in 28.5 x 178 x 200 mm	N/A
Packaging (H x W x D)	9.00 x 19.68 x 23.38 in 228.6 x 499.9 x 593.85 mm	22.64 x 12.72 x 24.41 in 575.0 x 323 x 620 mm
System Weight*	16.72 lbs 7.6 kg	24.54 lbs 11.15 kg
Shipping Weight*	17.86 lbs 8.1 kg	34.0 lbs 15.42 kg
Max Supported Weight (desktop orientation)	77 lb 35 kg	77 lbs 35 kg
*Configured with 1 hard drive, 1 optical drive, no diskette drive, and no PCI card.		

Unit Environment and Operating Conditions

General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

Temperature Range	Operating: 50° to 95° F (10° to 35° C)* Non-operating: –22° to 140° F(–30° to 60° C)
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)

*Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

Technical Specifications

Power Supply	SFF	CMT
Standard Efficiency	240W standard efficiency active PFC	320W standard efficiency active PFC
High Efficiency*	240W 89% efficient active PFC	320W 89% efficient active PFC
Operating Voltage Range	90 – 264 VAC	90 – 264 VAC
Rated Voltage Range	100 – 240 VAC	100 – 240 VAC
Rated Line Frequency	50/60 Hz	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz	47 – 63 Hz
Rated Input Current	4A	5.5A
Rated Input Current with Energy Efficient* Power Supply	4A	5.5A
Current Leakage (NFPA 99)	< 275 µA	< 450 µA
System Heat Dissipation	Typical 198 btu/hr (50 kg-cal/hr) Maximum 1063 btu/hr (268 kg-cal/hr	Typical 222 btu/hr (56 kg-cal/hr) Maximum 1410 btu/hr (356 kg-cal/hr)
System Heat Dissipation with Energy Efficient* Power Supply	Typical 150 btu/hr (38 kg-cal/hr) Maximum 941 btu/hr (237 kg-cal/hr)	Typical 171 btu/hr (43 kg-cal/hr) Maximum 1255 btu/hr (316 kg-cal/hr)
Power Supply Fan	92mm variable speed	92mm variable speed
External Power Adapter		
Dimensions	N/A	N/A
Total Cord Length	N/A	N/A

*High efficiency power supply is a requirement for ENERGY STAR qualification in conjunction with a select range of processors and modules

ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Elite PC into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Select models feature either Intel Standard Manageability or Core 2 processor with vPro Technology.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Computrace agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Business Desktop computer in any enterprise environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.

Additional HP BIOS Features

- Power-On password – Helps prevent an unauthorized user from powering on the system.
- Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP Elite models use ACPI to provide power conservation features.
- S5 Max Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 1W is S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.

Other Features

- Advanced Configuration and Power Management Interface (ACPI). Allows the system to wake from a low power mode. Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
- System Management BIOS v2.6
- Intel Wired for Management support; industry wide initiative to make Intel architecture based PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network
- Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button

Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 2-second pause, then repeats:
    - 2 – processor thermal protection activated
    - 3 – processor not installed
    - 4 – power supply failure
    - 5 – memory error
    - 6 – video error
    - 7 – PCA failure (ROM detected failure prior to video)
    - 8 – invalid ROM, bootblock recovery mode
    - 9 – system not fetching code
    - 10 – system hang while loading an option ROM
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch

- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Green Pull Tabs, and Quick Release Latches for easy Identification

Additional Features	Description
Computrace	Computrace agent included; separate software and subscription required
DT or MT Orientation	Product can be oriented in either a tower or desktop orientation
Drive Lock	Implementation of the industry standard ATA Security feature set. When enabled, it prevents software access to user data on the drive until one or two user-defined passwords are provided.
Drive Protection System	DPS Access through F10 Setup during Boot ● A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. ● Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced. The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.
SMART Technology (Self-Monitoring, Analysis and Reporting Technology) SMART I – Drive Failure Prediction SMART II – Off-Line Data Collection SMART III – Off-Line Read Scanning with Defect Reallocation SMART IV – End-to-End CRC for hard drives	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted ● Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count ● By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure ● IOEDC: I/O Error Detection Circuitry ● Detects errors in Read/Write buffers on HDD cache RAM Interface in F10 setup provides confirmation of SMART IV support.

Technical Specifications - Audio

High Definition Audio	Type	Integrated
	High Definition Stereo Codec	Yes - Realtek 4-channel ALC261 codec
	Audio Jacks	Front microphone-In (150-K ohm Input Impedance) Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load) Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load) Front Microphone/Headphone jack is re-task able to provide Microphone input, line-in or Headphone output to support connecting two headphones to the front of the system. When configured as a second front headphone output, both front headphone outputs are always driven with the same signal.
	Internal Speaker Amplifier is for the internal speaker only. External speakers need to be powered externally. Rear Line-In audio port is re-task able as Line-In or Microphone-In.	
	Multistreaming Capable	Multistreaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks.
	Sampling	8 kHz - 192 kHz
	Wavetable Syntheses (software)	Yes - Uses OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
	Internal Speaker	Yes
	External Speaker Jack (Line-Out)	Yes

Technical Specifications - Communications

Intel 82578 Gigabit Network Connection (integrated)	Connector	RJ-45
	Controller	Intel 82578 Gigabit platform LAN Connect Networking Controller
	Memory	24 KB FIFO packet buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	● IEEE 802.3i (10Base-T) ● IEEE 802.3u (100Base-TX) ● IEEE 802.3ab (1000Base-T) ● IEEE 802.3u (Auto-negotiation) ● IEEE 802.3af (Power over Ethernet) ● IEEE 1588 (Time Sync) ● IEEE 802.1ae (MacSec)
	Bus architecture	PCIe-based MAC to PHY interface
	Data transfer mode	PCIe-like interface for 1000 speed, SMBus interface for lower 10/100 speeds.
	Hardware certifications	FCC B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	Requires 3.3V & 1.2V. Power consumption 761 Milliwatts
	Boot ROM support	Yes
	Network transfer mode	Full-duplex
		Half-duplex (not supported 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
	Environmental	Operating temperature 0° to 85° C
	Management capabilities	WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic.
	Alerting	AMT 6.0 support

Technical Specifications - Communications

Broadcom NetXtreme GbE Ethernet Plus NIC	Connector	RJ-45	
	Controller	Broadcom 5761 PCI-Express LAN Controller	
	Memory	8 MB NVRAM serial Flash	
	Data rates supported	10/100/1000 Mbps	
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB, 802.3u, and 802.3x	
	Bus architecture	PCI-Express	
	Data path width	Single Channel PCI-Express	
	Data transfer mode	Bus Master DMA	
	Hardware certifications	FCC class B, Canada and US NRTL Mark, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia, UL listed (E212044), European Union Notice (CE 0682)	
	Power requirement	1.8W @ 3.3V	
	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	
	Environmental	Operating temperature	32° to 131°F (0° to 55° C)
		Operating humidity	131° F (55° C) with 5% to 95% non-condensing humidity
	Dimensions	2.75 in x 4.13 in (7 cm x 10.5 cm), low profile compatible	
	Operating system driver support	Windows Vista 32-bit SP1, Windows Vista x64 SP1, Windows XP 32 bit professional	
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility, ASF2.0, DASH 1.0 and DASH 1.1 profiles	

Technical Specifications - Communications

Intel Gigabit CT Desktop NIC	Connector	RJ-45	
	Controller	Intel 82574L Gigabit Ethernet Controller	
	Memory	40KB 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, 802.1as Time synch offload	
	Bus architecture	PCIe Base 1.1 (2.5 GT/s) x1	
	Data path width	X1, 250 MB/s, Bi-directional interface	
	Data transfer mode	Bus-master DMA	
	Hardware certifications	(see EPS for more certification details) EMI: FCC Class B Intel 25-GS3000 Environmental Specification. EN-55024: 1998 specification (see EPS for details) EN-55022: Class A 1998 specification. EN-60950-1 first Edition specification. C-Tick specification, Class A VCCI Class 1 specification. CE specification and CE Mark. UL 60950-1 first Edition specification. CSA 60950-1 first Edition specification. BSMI CNS13438 Class A specification Korean MIC Class A specification. European RoHS directive China RoHS directive	
	Power requirement	3.3V and 3.3V Aux, 2.1 Watts max in 1000Base-T (D0)	
	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 (actual rate limited by PCI Bus)	
	Environmental	Operating temperature	0 °C to 55 °C (operating) -40 to 70 °C (non-operating)
		Operating humidity	85% at 131° F (55° C)
	Dimensions	Low-profile, half-length form factor conforming to PCIe* CEM v1.1 (55 mm x 119 mm)	
	Management capabilities	SMBus, WOL, PXE	

HP Wireless 802.11b/g/n (PCIe)	Dimensions (L x H)	3.3 x 4.7 inches (8.5 x 12 cm)
	Weight	0.08 pounds (40 g)
	Controller	Ralink RT2790
	System interface	PCIExpress x1
	Network standard	802.11 b/g/n
	Frequency band	2.400 - 2.497 GHz

Operating temperature	14° to 149°F, operating (-10° to 65°C, operating)		
Storage temperature	-40° to 176°F, non-operating (-40° to 80°C, non-operating)		
Humidity	10-90% operating 5-95% non-operating		
Operating voltage	3.3V +/- 9% 12V +/- 8%		
Power consumption	Platform/WLAN Mode	Power Consumption	
	Maximum Power Consumption	10 Watts	
	Transmit Only	4 Watts maximum averaged power over 1 second	
	Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer	
	Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second	
	Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second	
	Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second	
	Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second	
Output power (approximately)	802.11b modes	802.11g modes	EWC modes
	+19 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum	+17 dBm +/- 1.0 dB maximum (total power in all transmit chains)
Receive sensitivity	Mode	Data rate	Sensitivity
	802.11b	1 Mbps	-94 dBm
	802.11b	11 Mbps	-85 dBm
	802.11g	6 Mbps	-91 dBm
	802.11g	18 Mbps	-85 dBm
	802.11g	48 Mbps	-75 dBm
	802.11g	54 Mbps	-72 dBm
	EWC (2.4 GHz)	6.5 Mbps	-87 dBm
	EWC (2.4 GHz)	54 Mbps	-82 dBm
	EWC (2.4 GHz)	81 Mbps	-78 dBm
	EWC (2.4 GHz)	162 Mbps	-74 dBm
	EWC (2.4 GHz)	270 Mbps	-68 dBm
	EWC (2.4 GHz)	300 Mbps	-64 dBm
Data transfer rate	Data Rate (MCS)	Minimum Throughput	
	1 Mbps (802.11 b)	700 kbps	
	2 Mbps (802.11 b)	1.4 Mbps	
	5.5 Mbps (802.11 b)	3.5 Mbps	

	11 Mbps (802.11 b)	5.9 Mbps
	12 Mbps (802.11 g)	6 Mbps
	18 Mbps (802.11 g)	9 Mbps
	24 Mbps (802.11 g)	12 Mbps
	36 Mbps (802.11 g)	18 Mbps
	48 Mbps (802.11 g)	21 Mbps
	54 Mbps (802.11 g)	22.5 Mbps
	6.5 Mbps (20 MHz EWC)	4.5 Mbps
	13 Mbps (20 MHz EWC)	9 Mbps
	19.5 Mbps (20 MHz EWC)	13.5 Mbps
	26 Mbps (20 MHz EWC)	18 Mbps
	39 Mbps (20 MHz EWC)	27 Mbps
	52 Mbps (20 MHz EWC)	36 Mbps
	58.5 Mbps (20 MHz EWC)	40 Mbps
	65 Mbps (20 MHz EWC)	45 Mbps
	78 Mbps (20 MHz EWC)	54 Mbps
	104 Mbps (20 MHz EWC)	72 Mbps
	117 Mbps (20 MHz EWC)	81 Mbps
	130 Mbps (20 MHz EWC)	91 Mbps
	13.5 Mbps (40 MHz EWC)	8 Mbps
	27 Mbps (40 MHz EWC)	16 Mbps
	40.5 Mbps (40 MHz EWC)	24 Mbps
	54 Mbps (40 MHz EWC)	32 Mbps
	81 Mbps (40 MHz EWC)	48 Mbps
	108 Mbps (40 MHz EWC)	64 Mbps
	121.5 Mbps (40 MHz EWC)	72 Mbps
	135 Mbps (40 MHz EWC)	81 Mbps
Security	● IEEE and WiFi compliant 64 / 128 bit WEP encryption ● AES: CCM ● 802.1x authentication ● WPA: 802.1x. WPA-PSK and TKIP ● WPA2 certification ● IEEE 802.11i ● Cisco Certified Extensions, all versions through V5	
Antenna	HP part number 497792-001	
Certifications	Wi-Fi certified	
Certifications for use by country	United States, Canada, Peru, Taiwan	

Technical Specifications - Communications

LSI PCIe x1 56K International SoftModem	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/ 16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI express bus Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	LSI SV92EX - Integrated PCI interface with 3.3-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI express low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Single RJ-11 connector
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.

Other	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

Intel® HD Graphics

3D/2D Controller	Microsoft DirectX® 10 based with support for Pixel Shader 3.0
VGA Controller	Integrated
DisplayPort	Integrated, Multimode capable; supports HDCP
Bus Type	PCI Express™ x16
RAMDAC	Integrated, 350 MHz
Memory	Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed, BIOS settings, operating system, and system load. 32 MB is pre-allocated for graphics use at system boot time. Additional memory can be allocated at boot time by the BIOS for PAVP (Protected Audio Video Playback) support for playback of protected video content. For Vista, use of PAVP heavy mode preallocates an additional 96MB.

Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use.

Windows XP Memory Usage:

Total System Memory	Pre-Allocated (MB)	DVMT (MB)
.5GB	32	128
1.0GB	32	512
1.5GB	32	768
2GB & more	32	1024

Windows Vista Memory Usage:
(Assumes Management Engine , VT-d enabled and other memory allocated for other BIOS usage)

System Memory	PVAP	Avail System Memory (MB)	Total Avail GFX Memory (MB)	Dedicated Video Memory (MB)	System Video Memory (MB)	Shared System Memory (MB)
1 GB	Lite	952	252	32	96	124
	Heavy	856	294	122	6	166
2 GB	Lite	1976	764	32	96	636
	Heavy	1880	806	122	6	678
4 GB	Lite	4024	1759	32	96	1631
	Heavy	3928	1759	122	6	1631
6 GB	Lite	6072	1759	32	96	1631
	Heavy	5976	1759	122	6	1631
8 GB	Lite	8120	1759	32	96	1631
	Heavy	8024	1759	122	6	1631

Total Available GFX Memory: Total graphics memory available to the system as reported by the OS.

Dedicated Video Memory: Memory owned and locked for graphics use as reported by the OS. (Preallocated)

System Video Memory: System memory locked and dedicated for graphics use.

	Shared System Memory: Memory dynamically allocated for Graphics use
HW Video Decode	Hardware Accelerated decode for MPEG2 encrypted video; support for PAVP Lite (default) and Heavy (or Paranoid) modes
Maximum Color Depth	32 bits/pixel
Maximum Vertical Refresh Rate	85 Hz at up to 1920x1440, 75 Hz at 2048x1536. Varies with mode and configuration. See table below.
Multi-display Support	Integrated dual independent monitor support facilitated via one VGA port and one DisplayPort integrated on the back plane of the system board and presented as part of the rear I/O set of interfaces. DVI supported via optional HP DisplayPort to DVI-D adapter.
Graphics/Video API Support	Microsoft DirectX® 10, OpenGL® 1.5 (OpenGL® 2.0 available in a driver update)

Resolutions Supported

NOTE: Other resolutions may be available but are not recommended as the may not have been tested and qualified by HP.

	Maximum Refresh Rate (Hz)	
Resolution	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a DisplayPort connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

Technical Specifications - Graphics

NVIDIA Quadro NVS 290 256MB PCIe Dual Head	Form Factor	Low Profile
	Bus Type	PCIe x16
	Memory	256 MB 400MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connector	DMS-59; includes one DMS-59 to Dual VGA cable. A DMS-59 to Dual DVI-I cable is available as an option.
	Display resolution support	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
	Color planes	32-bit color buffer
	Overlay planes	Hardware supported
	nView architecture	Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows.
	Multi-Monitor support	Dual monitor support
	DVI support	DMS-59 (to dual DVI-SL)
	High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	Supported graphics APIs	OGL 2.1 & DX10 Support; Shader Model 4.0

NVIDIA Quadro NVS 295 Graphics Card	Form Factor	2.731 inches (H) × 6.600 inches (L), Half-Height
	Graphics Controller	NVIDIA Quadro NVS 295 Graphics Board
	Bus Type	PCI Express x16, Generation 2.0
	Memory	256 MB GDDR3 SDRAM unified graphics memory
	Connectors	2 DisplayPort Comes with 2 DisplayPort to VGA Adapters NOTE: When purchased as an after-market option, this comes instead with 2 DisplayPort to DVI-D adapters.
	Maximum Resolution	Two DisplayPort outputs drive two digital displays up to 2560 x 1600
	Display Output	● Drives DisplayPort enabled digital displays at resolutions up to 2560 × 1600 at 60 Hz with reduced blanking ● Drives DVI enabled digital displays at resolutions up to 1920 × 1200 at 60 Hz with reduced blanking (through DisplayPort to DVI-D (single link) cable)
	Supported Graphics APIs	OpenGL 3.0 DirectX 10.0

Technical Specifications - Graphics

NVIDIA GeForce 310 DP PCIe x16 Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2560x1600 digital, 2048 x 1536 analog

NVIDIA GeForce 310 DP PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as the may not have been tested and qualified by HP.

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection.

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

Board display options	Supports two displays via the DisplayPort and DVI connectors	
Board configuration	Specification	Description
	Graphics Chip	RV620
	Core clock	750 MHz
	Memory clock	500 MHz
	Frame buffer	512 MB DDR3, 64 bit wide
Audio Support (through HDMI only)	Integrated HD Audio codec supports linear PCM and Dolby® Digital (7.1) audio formats for HDMI output	
Operating systems support	Windows 7 Home Basic*, Windows 7 Home Premium*, Windows 7 Professional Edition 32*, Windows 7 Professional Edition 64*, Windows 7 Ultimate Edition 32*, Windows 7 Ultimate Edition 64*, Windows Vista Business 32†, Windows Vista Business 64†, Windows Vista Home Basic 32†, Windows Vista Home Basic 64†, Windows XP Professional or Windows XP Home 32†.	

*This system may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

Windows 7 Business disk may be 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

† 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.

Linux x86 and x86_64 distributions using XFree86 or X.Org‡.

‡Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information.

Core power	22 W (max)
Dimensions (H x D)	2.71 in x 6.60 in (68.90 mm x 167.65 mm)
Weight	0.30 lb (134.3 g)
Option kit contents	● NVIDIA GeForce 310 DP PCIe x16 Graphics Cardwith full height bracket attached ● DVI to VGA adapter ● Software CD with graphics drivers ● Low profile bracket to convert the card for using in a low profile chassis ● Warranty documentation
Compliance standards	EMC Emissions: a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use b) CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c) Canadian Standard ICES-003 is equivalent to CISPR22 d) Taiwanese Standard BSMI e) Japanese VCCI f) Australian C-Tick g) Korean (MIC) EMC Immunity: CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement.

ATI Radeon HD 4550 Dual Head PCIe x16 Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	1900 x 1200 digital, 2048 x 1536 analog
	Board display options	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output

Technical Specifications - Graphics

Board configuration	Specification	Description
	Graphics Chip	RV710
	Core clock	600MHz
	Memory clock	800 MHz
	Frame buffer	512 MB DDR3, 64 bit wide

Languages supported

24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

Compliance standards

EMC Emissions:
a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use
b) CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment
c) Canadian Standard ICES-003 is equivalent to CISPR22
d) Taiwanese Standard BSMI
e) Japanese VCCI
f) Australian C-Tick
g) Korean (KCC)

EMC Immunity:
CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement.

ATI Radeon HD 4550 DH PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as the may not have been tested and qualified by HP.

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	N/A

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

ATI Radeon HD 4650 DP (1GB) PCIe x16 Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2560 x 1600 digital, 2048 x 1536 analog

ATI Radeon HD 4650 DP (1GB) PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as the may not have been tested and qualified by HP

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

Board display options	Supports two displays via included two DisplayPort and one Dual Link DVI-I connectors.	
Board configuration	Specification	Description
	Graphics Chip	RV635
	Core clock	725 MHz
	Memory clock	500 MHz
	Frame buffer	1 GB DDR3, 128 bit wide
Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish	
Operating systems support	Windows 7 Home Basic*, Windows 7 Home Premium*, Windows 7 Professional Edition 32*, Windows 7 Professional Edition 64*, Windows 7 Ultimate Edition 32*, Windows 7 Ultimate Edition 64*, Windows Vista Business 64**, Windows Vista Business 32**, Windows Vista Home Basic 32**, Windows XP Professional or Windows XP Home 32**. *This system may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.	

	** 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. Linux x86 and x86_64 distributions using XFree86 or X.Org***. *** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information.
Core power	56 W
Option kit contents	• ATI Radeon HD 4650 DP (1GB) PCIe x16 Graphics Card with full height bracket attached • DVI to VGA adapter • DisplayPort to DVI-D adapter • Software CD with graphics drivers • Warranty documentation
Compliance standards	EMC Emissions: a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use b) CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c) Canadian Standard ICES-003 is equivalent to CISPR22 d) Taiwanese Standard BSMI e) Japanese VCCI f) Australian C-Tick g) Korean (MIC) EMC Immunity: CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement.

HP ADD2 SDVO PCIe DVI-D Adapter	Models	HP ADD2 SDVO DVI-D Out Adapter
	Form Factor	Low-profile card
	DVI-D Connector	Digital connection only
	Dual Head Support	Yes, when used with the integrated VGA connector
	Display Devices Supported	HP L1740 HP L1940T HP L2045W HP LP1965
	NOTE: These graphics adapters offer optimal performance with any display that meets applicable VESA standards.	
	Color Depth	All modes support 8-bpp, 16-bpp, and 24-bpp color depths
	Host Interface Connector	Mechanically compliant with PCI-E standard Complies with the Intel ADD2 and Intel Serial Digital Video Output (SDVO) specifications
	Dot Clock	165 MHz maximum

Technical Specifications - Graphics

Display Modes	Supports display modes that require up to 165-MHz bandwidth on the link, as shown in the following table.

Resolution		60-Hz LCD	60-Hz	75-Hz	85-Hz
Blanking		5% reduced	GTF	GTF	GTF
640 x 480	VGA	Yes	Yes	Yes	Yes
800 x 600	SVGA	Yes	Yes	Yes	Yes
1024 x 768	XGA	Yes	Yes	Yes	Yes
1280 x 1024	SXGA	Yes	Yes	No	No
1600 x 1200	UXGA	Yes	Yes	No	No

HP DisplayPort to DVI-D Adapter	Connectors	DisplayPort and DVI-D single link connector
	Adapter length	7.5 in (19.0 cm)
	Adapter weight	.10 lbs (.05 kg)

HP DisplayPort to VGA Adapter	Connectors	DisplayPort and VGA connector
	Adapter length	8 in (20 cm)
	Adapter weight	.1 lbs (.06 kg)
	Maximum vertical refresh rate	85 Hz
	Display support	162 MHz RAMDAC
	Display max resolution	1600x1200

HP DisplayPort to VGA adapter display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP. Using the HP DisplayPort to VGA Adapter may require an update to the graphics driver installed on your system. To install the most up-to-date graphics driver go to: www.hp.com.

Resolution	Max refresh rate
640x480	85
800x600	85
1024x768	85
1280x720	85
1280x1024	85
1440x900	75
1600x1200	60
1680x1050	60
1920x1080	60-R
1920x1200	60-R

NOTE: 60-R denotes reduced blanking timings are used. Not all monitors support reduced blanking timing.

Technical Specifications - Hard Drives

3.5" 7200 RPM Serial ATA Hard Drives	500 GB	Capacity	500,107,862,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm)	
			Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 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)	
	320 GB	Capacity	320,069,031,690 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm)	
			Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	625,142,448	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	250 GB	Capacity	250,059,350,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm)	
			Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	8 MB	

		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	488,397,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	
	160 GB	Capacity	160,041,885,696 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.9 ms
			Average	9.3 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	312,581,808	
		Operating Temperature	41° to 131° F (5° to 55° C)	
10,000 RPM Serial ATA Hard Drives	160 GB	Capacity	160,041,885,696 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.0 in (7.62 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 3.0 Gb/s	
		Cache	16 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.3 ms
			Average	4.6 ms
			Full-Stroke	10.2 ms
		Rotational Speed	10,000 rpm	
		Logical Blocks	312,581,808	
		Operating Temperature	41° to 131° F (5° to 55° C)	

Technical Specifications - Hard Drives

Solid State Drive	64 GB	Capacity	64 GB	
		NAND Flash Memory	Multi Level Cell (MLC) with wear leveling controller	
		Interface type	SATA 3Gb/sec	
		Dimensions-external (W x H x D)	2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm)	
		Weight	0.14 lb (65 g)	
		Internal transfer rate	Write speed	Up to 220 MB/s
			Read speed	Up to 120 MB/s
		Host transfer rate	Ultra DMA mode	Up to 150 MB/s
		Power	DC power requirement	5 VDC 5%-100 mV ripple p-p
			Total power consumption	<1.12Watt
		Environmental (all conditions, non-condensing)	Temperature (operating)	32° to 158° F (0° to 70° C)
			Relative Humidity (operating)	5% to 95%
			Maximum Wet Bulb Temperature (operating)	84° F (29° C)
		Regulations	UL, CSA, EN 60950-2000, CISPR Pub 22 Class B, CNS 13438, AS/NZS CISPR 22:2002 Class B, R1113 and C1172 Class B	

NOTE: For solid state disk drives, GB means 1 billion bytes. 16GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity varies by content and will be less than 15.8GB.

Technical Specifications - Input/Output Devices

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

Technical Specifications - Input/Output Devices

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

HP USB Smartcard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Form factor	USB basic Smart Card keyboard
		Colors	Carbonite/Silver
		Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%

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

		Communication	From card	Programmable from 9,600 baud to 115,200 baud
			From computer	Up to 38,400 baud
		Landing mechanism	Contact device	Friction contact
			Card insertions rating	Up to 100,000 insertion cycles
		Interface modes	USB communications through USB port SCM protocol Automatic card insertion/removal detection	
		Reader performance interface	USB connection	
		Electro-magnetic standards	Europe	89/336/CEE guideline
			USA	USAFCC part 15
HP PS/2 Optical Scroll Mouse	Dimensions (H x L x W)	3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in)		
	Weight	4.44 oz (126 g)		
	Environmental	Operating temperature	-32° to 104°F (0° to 40° C)	
		Non-operating temperature	-4° to 140°F (-20° to 60° C)	
		Operating humidity	10% to 90% (non condensing at ambient)	
		Non-operating humidity	10% to 90% non condensing	
		Operating shock	40 g, 6 surfaces	
		Non-operating shock	80 g, 6 surfaces	
		Operating vibration	2 g peak acceleration	
		Non-operating vibration	4 g peak acceleration	
		Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face	
	Electrical	Operating voltage	5 VDC ± 10%	
		Power consumption	100mA	
		System consumption	PS/2 mini-din connector	
		ESD	CE level 4, 15 kV air discharge	
		EMI-RFI	Conforms to FCC rules for a Class B computing device	
		Microsoft PC99 - 2001	Functionally compliant	
	Mechanical	Resolution	400 ± 20% DPI	
		Tracking speed	10 in/s (25.4 cm/s) maximum	
		Acceleration	100 in/s/s (2.54 m/s/s)	
		Switch actuation	61 g nominal peak force	
		Switch life	3,000,000 operations (using Hasco modified tester)	
		Switch type	Low force micro-switches	

		Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
		Cable length	6 ft (1.8 m)
		Microsoft PC99 - 2001	Mechanically compliant
	Scroll wheel	Width	8 mm
		Diameter	1.01 in (25.6 mm)
		Maximum rotation speed	48 rats/sec
		Switch type	Light force micro-switch
		Switch life	1 million operations
		Mechanical life	Minimum 200,000 revolutions
	Regulatory approvals	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

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

HP USB 2-Button Laser Mouse	Scroll Wheel	24	
	Maximum Rotation Speed	48 rats/sec	
	Switch Type	wheel	
	Switch Life	Button - 3,000,000 Wheel - 1,000,000 times Tilt switch - 500,000 times	
	Environmental	Operating Temperature	32° to 104° F (0° to 40° C)
		Non-operating Temperature	-4° to 140° F (-20° to 60° C)
		Operating Humidity	10% to 90% (non-condensing at ambient)
		Non-operating Humidity	20% to 80% (non-condensing at ambient)
		Operating Shock	40 g, six surfaces
		Non-operating Shock	80 g, six surfaces
		Operating Vibration	2-g peak acceleration
		Non-operating Vibration	4-g peak acceleration
	Electrical	Operating Voltage	+ 5VDC ± 5%
		Power Consumption	
		MTBF	> 150,000 hrs
		ESD	IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV
		EMI-RFI	FCC Class B
		PC98	PC 99 Compliant
	Mechanical	Resolution	800dpi
		Tracking Speed	25 cm/sec

	Acceleration	0.5mm
	Switch Actuation	0.6N (60gf)
	Switch Life	Button - 3,000,000 Wheel - 1,000,000 times Tilt switch - 500,000 times
	Cable Length	1850mm
	PC98-99	PC99 compliant
Regulatory Approvals	UL60950-1, UL 94, UL 746 (A-E), UL 796 TUV/GS: EN 60950-1, EN 60825-1 FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL	

Technical Specifications - Optical Storage

HP Blu-ray Writer Drive	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	50 GB DL or 25 GB standard		
	Dimensions (W x H x D)	5.9 x 1.7 x 7.5 in (15.0 x 4.4 x 19.0 cm)		
	Weight (max)	2.0 lb (907g)		
			Single-layer	Double-layer
	Write speed	BD-R	2x, 4x CLV, 6x CAV	2x, 4x CLV
		BD-RE	2.3x	2x CLV
		DVD-R	2x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2x, 4x CLV
		DVD-RW	1x, 2x, 4x, 6x CLV	Not supported
		DVD+R	2.4x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2.4x, 4x CLV
		DVD+RW	2.4x, 4x, 6x CLV, 8x ZCLV	Not supported
		DVD-RAM	2x, 3x CLV, 3-5x PCAV	
		CD-R	8x,16x CLV, 24x, 32x PCAV, 40x CAV	
		CD-RW	4x, 10x, 16x CLV, 24x ZCLV	
			Single-layer	Double-layer
	Read speeds	BD-ROM	6x CAV	4.8x CAV
		BD-R	6x CAV	4.8x CAV
		BD-RE (SL/DL)	4.8x CAV	4.8x CAV
		DVD-ROM	16x CAV	8x CAV
		DVD-R	12x CAV	8x CAV
		DVD-RW	10x CAV	Not support
		DVD+R	12x CAV	8x CAV
		DVD+RW	10x CAV	Not support
		BDMV (AACS Compliant Disc)	4.8x CAV	
		DVD-RAM	2x, 3x CLV, 3x-5x PCAV	
		DVD-Video (CSS Compliant Disc)	8x CAV	
		CD-R/RW/ROM	40x / 40x / 40x CAV	
		CD-DA (DAE)	32x CAV	
		80 mm CD	16x CAV	
	Sustained Transfer rate	BD-ROM	26.97 MB/s (6x) max	
		DVD-ROM	16.62 MB/s (16x) max.	
		CD-ROM	6,000 KB/s (40x) max.	
	Burst Transfer rate		1.5Gbps bits/s (10b side) 1.2Gbps bits/s (8b side)	

Technical Specifications - Optical Storage

	Multimedia MPC-3 compliant		Yes
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum
	Environmental (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
		Relative Humidity (operating)	10% to 90%
		Maximum Wet Bulb Temperature (operating)	86° F (30° C)

HP SuperMulti LightScribe DVD Writer Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speeds	DVD-RAM	Up to 12X
		DVD+R	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 8X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	DVD-RAM	Up to 12X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
	Power	Source	SATA DC power receptacle

Technical Specifications - Optical Storage

		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)
			12 VDC (< 600 mA typical, 1400 mA maximum)
	Environmental conditions (operating - non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

HP DVD-ROM Drive	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	Weight (max)	2.6 lb (1.2 kg)		
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X	
		DVD-ROM	Up to 16X	
		DVD-RAM	Up to 4X	
		CD-ROM, CD-R	Up to 48X	
		CD-RW	Up to 32X	
	Removable Storage - Media Compatibility - DVD-ROM	Media	Read	Write
		CD-ROM	Yes	No
		CD-R	Yes	No
		CD-RW	Yes	No
		DVD-ROM	Yes	No
		DVD-ROM DL	Yes	No
		DVD-RAM	Yes	No
		DVD+R	Yes	No
		DVD+R DL	Yes	No
		DVD+RW	Yes	No
		DVD-R	Yes	No
		DVD-RW	Yes	No
		DVD-R DL	Yes	No
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
		Cache Buffer	2 MB (minimum)	

	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
Power	Source	SATA DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC -< 600 mA typical, < 1400 mA maximum
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)

HP 22-in-1 Media Card Reader (with 1394)	USB Interface	USB 2.0 High-speed interface NOTE: Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.	
	1394 Interface	Two IEEE-1394a external ports; 1 IEEE-1394a internal port (connects to the pass through cable on the media card reader)	
	Advance protocol support	● Supports hardware ECC (Error Correction Code) function ● Supports hardware CRC (Cyclic Redundancy Check) function ● Supports MS 4-bit parallel transfer mode ● Supports MS-PRO 4-bit parallel transfer mode ● Supports MS PRO-HG Duo 4-bit parallel transfer mode ● Supports SD 4-bit parallel transfer mode ● Supports high-speed 50Mhz SD 4-bit card (version 2.0) ● Supports high-speed 52Mhz MMC 8-bit card (version 4.2) ● Supports CF v4.0 with PIO mode 6 and Ultra DMA mode	
	Supported media type	● CompactFlash Type I ● CompactFlash Type II ● Microdrive ● MultiMediaCard (MMC) ● Reduced Size MultiMediaCard (RS MMC) ● MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) ● Reduced Size MultiMediaCard 4.2 (MMC Mobile, including MMC Mobile HC) ● Secure Digital Card (SD) ● Secure Digital High Capacity (SDHC) ● miniSD ● miniSD High Capacity ● Micro SD (T-Flash) ● Micro SD HC ● Memory Stick ● Memory Stick Select ● Memory Stick Duo (MS Duo) ● Memory Stick PRO (MS PRO) ● Memory Stick PRO Duo (MS PRO Duo) ● Memory Stick PRO-HG Duo ● MagicGate Memory Stick (MG) ● MagicGate Memory Stick Duo ● xD-Picture Card	
	Supported media type with card adapter	● Memory Stick Micro (M2) ● MMC Micro	
	Environmental	Operational Environmental Extremes	Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage. 10°C 10% R.H. = 24 hours 10°C 90% R.H. = 24 hours 20°C 90% R.H. = 24 hours 30°C 90% R.H. = 24 hours 40°C 90% R.H. = 24 hours 50°C 90% R.H. = 24 hours

		50°C 10% R.H. = 24 hours
	Storage Environmental Extremes	Test Parameters/Conditions 140°F (60°C) @ 80% R.H. for 96 hours -22°F (-30°C) @ 20% R.H. for 48 hours No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min
Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T	

Technical Specifications - Environmental Data

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 ® ● IT ECO declaration ● EPEAT Gold where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.

Convertible Minitower

Energy Consumption (typically configured)	115 VAC	230 VAC	100 VAC
Normal Operation	46.9450 W	47.0125 W	46.5123 W
Sleep (Energy Star low power mode)	3.7745 W	3.7250 W	3.6882 W
Off	0.7562 W	0.8895 W	0.7751 W

Heat Dissipation (typically configured)*	115 VAC	230 VAC	100 VAC
Normal Operation	161 BTU/hr	161 BTU/hr	159 BTU/hr
Sleep	13 BTU/hr	13 BTU/hr	13 BTU/hr
Off	3 BTU/hr	3 BTU/hr	3 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Additional Performance Data (for configuration specified in table)

HP Compaq 8100 Elite CMT	
Processor	Intel i5-660
Memory size	2 x 1 GB
Memory Type	DDR3 1333
Graphics Memory	32 + 32 + 667 MB
Graphics adapter/card	i5 series integrated
Graphics driver revision	1968
Resolution and color depth	1280 x 1024 x 32B
Video Refresh	75 Hz
HD	160GB – 7200 rpm
Partition type	NTFS
ODD	Lightscribe DVD/RW
OS rev, build and spack	Windows 7 Pro 32
Power Supply	High Efficiency
SYSMark 2007 -- Rating	185
E Learning	165
3D	196
Video Creation	178
Productivity	202
Windows Experience Index - Base	4.8

Processor	6.9
Memory	5.5
Graphics	4.8
Gaming Graphics	5.2
HDD	5.9
PCMark05 - Version 120 / 121	
Overall	7594
CPU	9398
Memory	7756
Graphics	3243
HDD	6259
Power readings - Watts	
PCM05 Peak Watts	72.18
PCM05 Average Watts	49.02
PCM05 Watt-hours	18.4

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.8	21
Fixed Disk (random writes)	3.8	21

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

Battery size: CR2032 (coin cell)
Battery type: Li-Ion

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.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% post consumer recycled plastic (by wt.)
- This product is 90% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
    - Corrugated 2550 g
- Internal:
    - Polyethylene high density 160 g
- The corrugated packaging material is made from 37% recycled content.
- The Polyethylene high density packaging material is made from 100% recycled content.

Small Form Factor

Energy Consumption (typically configured)	115 VAC	230 VAC	100 VAC
Normal Operation	39.787 W	39.547 W	39.865 W
Sleep (Energy Star low power mode)	3.2283 W	3.4659 W	3.2186 W
Off	1.0477 W	1.2128 W	1.0345 W

Heat Dissipation (typically configured)*	115 VAC	230 VAC	100 VAC
Normal Operation	161 BTU/hr	161 BTU/hr	136 BTU/hr
Sleep	13 BTU/hr	13 BTU/hr	11 BTU/hr
Off	3 BTU/hr	3 BTU/hr	4 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Additional Performance Data (for configuration specified in table)

	HP Compaq 8100 Elite SFF	
BIOS version	786H1 – 0.51	
Processor	Intel i5-660 - Turbo enabled	
Memory size	2 x 1 GB	
Memory Type	DDR3 1333	
Graphics Memory	32 + 32 + 667 MB	
Graphics adapter/card	i5 series integrated	
Graphics driver revision	1968	
Resolution and color depth	1280 x 1024 x 32B	
Video Refresh	75 Hz	
HD	160GB – Seagate 7200 rpm	
Partition type	NTFS	
ODD	Lightscribe DVD/RW	
OS rev, build and spack	Windows 7 Pro 32	
run by	CPA Lab	
PS Vendor	Lite-On	HiPro
PS Model	503375-001	503376-001

Technical Specifications - Environmental Data

EPA / non-EPA	non-EPA	EPA
Power readings – Watts		
Off – WOL with F10 Setup S5 Max Savings	0.48	0.42
Off –WOL	0.72	0.67
Off + WOL	0.72	0.67
Sleep / Standby	2.48	2.48
Idle	39.77	30.44
PCM05 Peak Watts	89.51	74.32
PCM05 Average Watts	61.65	49.52
PCM05 Watt-hours	23.43	18.75

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.7	27
Fixed Disk (random writes)	3.7	27

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

Battery size: BR-2032
Battery type: Lithium

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.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% post consumer recycled plastic (by wt.)
- This product is 95.1% recyclable when properly disposed of at end of life.

Packaging Materials

- External:

    - Corrugated – 1700 g
- Internal:
    - EPE - Expanded Polyethylene – 160 g
    - Polyethylene low density foam – 160 g
- The Corrugated Carton packaging material is made from 100% recycled content.
- The EPE – Expanded Polyethylene packaging material is made from 100% recycled content
- The Polyethylene low density foam packaging material is made from 100% recycled content

Convertible Minitower and Small Form Factor

RoHS Compliance

Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances will be virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

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 Biphenyl 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 Tin (TBT), Triphenyl Tin (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.
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/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: 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

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