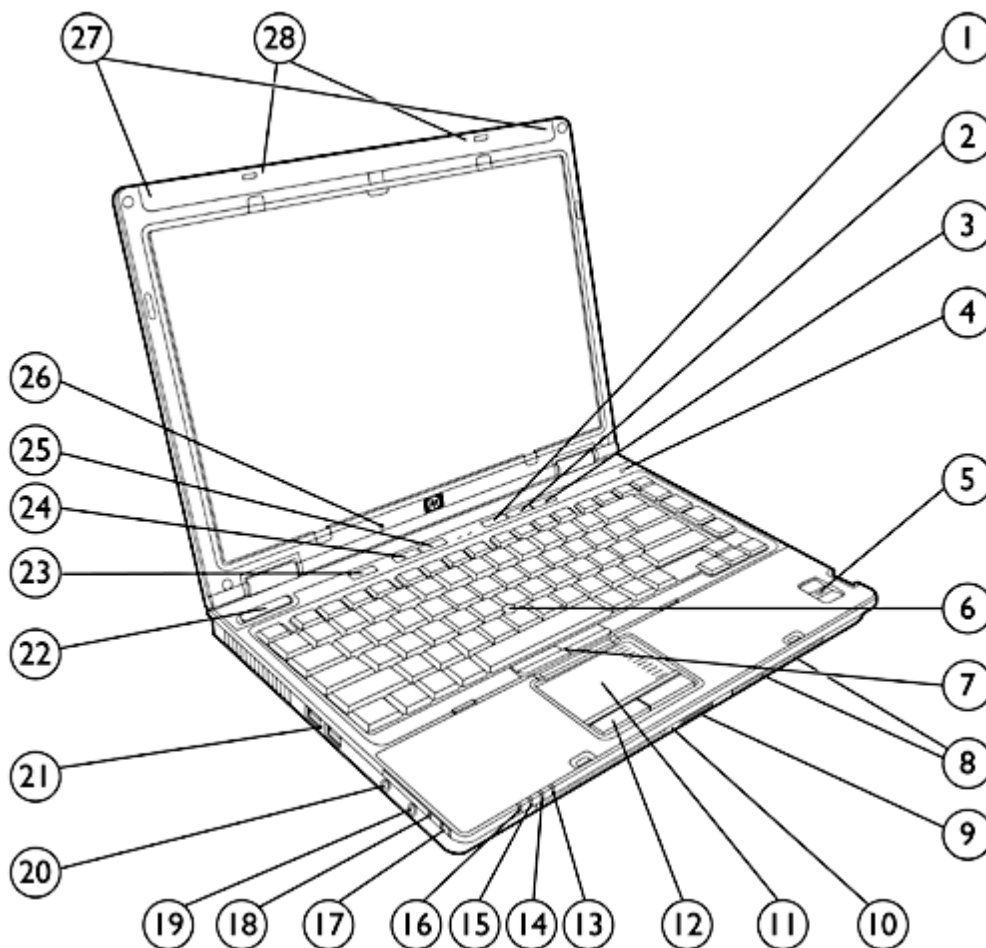
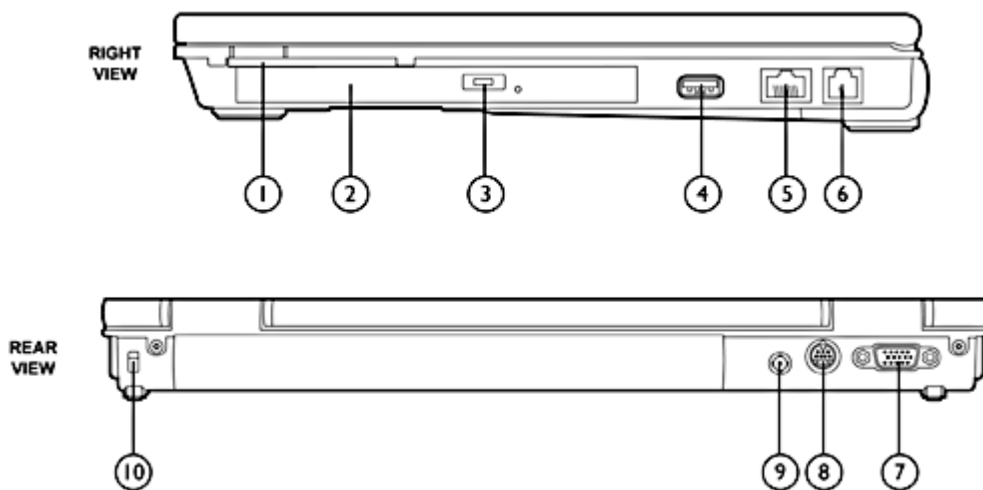


HP recommends  
Windows Vista® Business



- |                                 |   |
|---------------------------------|---|
| 1. Volume Mute Button with LED  | 15. Power/Standby LED                                       |
| 2. Volume Down Button           | 16. Wireless On/Off LED                                     |
| 3. Volume Up Button             | 17. PC Card Eject Button                                    |
| 4. Integrated Microphone        | 18. PC Card Slot  |
| 5. Biometric Fingerprint Sensor | 19. Headphone Jack  |
| 6. Pointstick                   | 20. Microphone Jack   |
| 7. Pointstick Buttons           | 21. 2 USB 2.0 Ports   |
| 8. Stereo Speakers              | 22. Power Button with LED                                   |
| 9. SD Media Slot                | 23. HP Info Center Button                                   |
| 10. Fast Infrared Port          | 24. Wireless On/Off Button with LED                         |
| 11. Touchpad with scroll zone   | 25. Presentation Mode Button                                |
| 12. Touchpad Buttons            | 26. Ambient Light Sensor                                    |
| 13. Hard Drive Activity LED     | 27. Dual-band Wireless LAN Antennas                         |
| 14. Battery Charging LED        | 28. 5-Band Wireless WAN Antennas (enabled with WWAN option) |

## Overview



- |  |                              |
|--|------------------------------|
| 1. Integrated Smart Card Reader        | 6. RJ-11 Port (Modem)        |
| 2. MultiBay II Drive with Easy Release | 7. VGA/External Monitor Port |
| 3. Optical Drive Button                | 8. S-Video TV Out            |
| 4. USB 2.0 Port                        | 9. Power Connector           |
| 5. RJ-45 Port (NIC)                    | 10. Kensington Lock Slot     |

## At A Glance

- Genuine Windows Vista Business 32, Genuine Windows Vista Home Basic 32, Genuine Windows XP Professional, Genuine Windows XP Home Edition, or FreeDOS
- Sleek light-weight design starting at under 4.4 lb (2.0 kg) and 1.1 inch (29.2 mm) thin at front
- 14.1-inch wide screen display
- Intel® Core™ 2 Duo processors, Intel Core Duo processors, or Intel Core Solo processor
- Mobile Intel 945GM Express Chipset or Mobil Intel 945PM Express Chipset
- Up to 4GB\* of 533- or 667-MHz DDR2 SDRAM, dual channel memory support
- ATI Mobility Radeon X1300 or Intel Graphics Media Accelerator 950
- Up to 100-GB 7200 rpm, user-removable hard drive
- Optional integrated HP ev2200 1xEV-DO or HP hs2300 HSDPA Broadband Wireless module (select countries only)
- Optional integrated 802.11 a/b/g or 802.11 b/g wireless LAN module and Bluetooth®
- Support for optional Intel Centrino™ Duo mobile technology
- Protected by three-year standard parts and labor warranty – certain restrictions and exclusions apply

\* Above 3-GB, all memory may not be available due to system resource requirements.

### Standard Features

#### Processors

Intel Core 2 Duo Processor T7600 (2.33-GHz, 667-MHz FSB, 4-MB L2 cache)\*  
Intel Core 2 Duo Processor T7400 (2.16-GHz, 667-MHz FSB, 4-MB L2 cache)\*  
Intel Core 2 Duo Processor T7200 (2.0-GHz, 667-MHz FSB, 4-MB L2 cache)\*  
Intel Core 2 Duo Processor T5600 (1.83-GHz, 667-MHz FSB, 2-MB L2 cache)\*  
Intel Core 2 Duo Processor T5500 (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)\*  
Intel Core Duo Processor T2600\* (2.16-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2500\* (2.00-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2400\* (1.83-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo Processor T2300\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Duo processor T2300E\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)  
Intel Core Solo Processor T1300\* (1.66-GHz, 667-MHz FSB, 2-MB L2 cache)

\* Intel's numbering is not a measurement of higher performance.

**NOTE:** Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

#### Operating System

##### Preinstalled

Genuine Windows Vista Business 32\*  
Genuine Windows Vista Home Basic 32\*  
Genuine Windows XP Professional SP2  
Genuine Windows XP Home Edition SP2  
FreeDOS

##### Supported

(select drivers available on  
<http://www.hp.com>)

Genuine Windows Vista Business 64\*†  
Genuine Windows Vista Enterprise\*†  
Genuine Windows 2000

##### Certified

SUSE Linux Enterprise Desktop 10

\* Certain Windows Vista product features require advanced or additional hardware.

See <http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx> and <http://www.microsoft.com/windowsvista/getready/capable.mspx> for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit <http://www.windowsvista.com/upgradeadvisor>.

† At initial boot, either 32- or 64-bit can be selected. This is a one time selection and the other version will be deleted.

#### Chipset

Mobile Intel 945PM Express Chipset with 667-MHz front side bus (models with discrete graphics)  
or  
Mobile Intel 945GM Express Chipset with 667-MHz front side bus (models with integrated graphics)

### Standard Features

#### Graphics

For discrete graphics models with 256MB of system memory:

ATI Mobility Radeon X1300 128MB HyperMemory\*

Microsoft DirectX 9 capable

For discrete graphics models with 512MB of system memory:

ATI Mobility Radeon X1300 256MB HyperMemory\*\*

Microsoft DirectX 9 capable

For discrete graphics models with 1024MB or more of system memory:

ATI Mobility Radeon X1300 512MB HyperMemory\*\*

Microsoft DirectX 9 capable

For integrated graphics models:

Intel Graphics Media Accelerator 950 with up to 224MB shared system memory, depending on model

Microsoft DirectX 9 capable

\* Indicates dedicated video memory and shared system memory. 64MB dedicated video memory.

\*\* Indicates dedicated video memory and shared system memory. Either 64MB or 128MB dedicated video memory, depending on model.

#### Display

##### Internal

14.1-inch WXGA (1280 x 800 resolution)

14.1-inch WXGA+ (1440 x 900 resolution)

Ambient Light Sensor

##### External

Up to 32-bit per pixel color depth

VGA port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz

DVI port in optional HP Docking Station (sold separately)

supports resolutions up to 1600 x 1200 at both full and reduced blanking, and 1920 x 1200 at reduced blanking

**NOTE:** Resolutions are dependent upon monitor capability, and resolution and color depth settings.

#### Memory

##### Standard

256-MB, 512-MB, 1024-MB or 2048-MB 533-MHz or 667-MHz DDR2 SDRAM; two SODIMM slots supporting dual channel memory

##### Maximum

Upgradeable to 4096-MB maximum (2048-MB SODIMM in slots 1 and 2)

##### Dual-channel

Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

**NOTE:** Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. Above 3-GB, all memory may not be available due to system resource requirements.

### Standard Features

#### Communications

Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (10/100/1000 NIC)\*  
56K V.92 modem\*\* with digital line guard

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

\*\* Designed for downloads from 56K modem compliant sources. Maximum achievable download transmission rates currently do not reach 56 KB/s, and will vary with line conditions. Modem availability is subject to country regulatory approval.

#### Wireless Devices

Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Integrated Bluetooth is also an option (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.

##### HP ev2200 1xEV-DO Broadband Wireless Module\*

Integrated dual band 800-MHz (cellular) and 1900-MHz (PCS) WWAN module connects to the Verizon Wireless BroadbandAccess and NationalAccess networks (US only)  
Supports CDMA 1xEV-DO, 1xRTT connections

**NOTE:** Separately purchased Verizon Wireless service is required. For details, go to <http://www.hp.com/go/broadbandwireless>.

Upgradeable design and two 800/900/1800/1900/2100-MHz antennas integrated in the top of the display panel support current and future WWAN technologies

##### HP hs2300 HSDPA Broadband Wireless Module\*

Integrated WWAN module that provides connection to GSM, GPRS, EDGE, UMTS, and HSDPA mobile networks in many countries. Currently supported networks are the Cingular network in the U.S. and Vodafone networks in Australia, France, Italy, Germany, Netherlands, New Zealand, Spain, and UK, and roaming on Vodafone and partner networks in more than 60 countries.

**NOTE:** Separately purchased mobile network operator service is required. Upgradeable design and two 800/900/1800/1900/2100-MHz antennas integrated in the top of the display panel support current and future WWAN technologies.

##### All integrated wireless LAN options

Wi-Fi certified  
Cisco Compatible Extensions support (Version 3.0)  
Wired Equivalent Privacy (WEP) support up to 128-bit keys  
Wi-Fi Protected Access (WPA) and WPA2 support  
802.1x authentication support, including EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, and LEAP  
Advanced Encryption Standard (AES) support  
WiFi certified for WPA2, WMM  
Dual antennas integrated in the display enclosure

##### Intel PRO/Wireless 3945ABG Network Connection

Intel Centrino mobile technology  
Integrated support for 802.11a, b and g  
Up to 54-mbps data rate

##### Intel PRO/Wireless 3945BG Network Connection

Intel Centrino mobile technology  
Integrated support for 802.11 b and g  
Up to 54-mbps data rate

##### Broadcom 4311AG WiFi Adapter

Integrated support for 802.11a, b and g  
Up to 54-mbps data rate

##### Broadcom 4311BG WiFi Adapter

Integrated support for 802.11 b and g  
Up to 54-mbps data rate

## Standard Features

**HP Integrated Module with Bluetooth 2.0 Wireless Technology** Bluetooth Specification v2.0 compliant  
Works with a wide range of Bluetooth devices

\* [Broadband Wireless Module \(WWAN\)](#) requires Microsoft Windows XP Professional and is available in select countries as a standard feature or as an option to be added later.

### Keyboard

The 101/102-key compatible keyboard features an industry standard, full-pitch key layout with desktop keyboard features, such as the isolated inverted-T cursor control keys, editing keys, both left and right control and alt keys, and 12 function keys. US and International key layouts are available. Other features include an integrated numeric keypad, hotkeys for instant access to power conservation, brightness, and other features, 19-mm x 19-mm key pitch (center-to-center spacing), 2.5-mm stroke, comfort-dished keycaps, and bright key legends for improved visibility in low light conditions.

### One-Touch Productivity Buttons

Provide one-touch access to the following features: HP Info Center, Wireless On/Off, Presentation Mode, Volume Up, Volume Down, and Volume Mute

### Pointing Device

Dual pointing devices:  
Touchpad with scroll zone, two soft-touch buttons  
and  
Pointstick, two soft-touch buttons

### Expansion Card Slots

**One Type I/II PC Card slot** Supports 32-bit CardBus and 16-bit PC Cards  
**Integrated Smart Card Reader** Compatible with ISO 7816 compliant Smart Cards  
PC/SC interface support

### Media Slots

**Secure Digital slot** Supports SD (Secure Digital), MMC (MultiMedia Card)

### Storage

**Hard Drives** 60-, 80-, 100-GB 7200 rpm SMART SATA  
40-, 60-, 80-, 100-GB 5400 rpm SMART SATA

**NOTE:** These hard drives are customer removable and will withstand multiple insertion/removal cycles. Up to 8 GB is reserved for the system recovery software.

**HP Mobile Data Protection System 3D** Hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive. Uses three-axis digital motion detection with intelligent sensitivity to help protect the hard drive during normal use from shock and vibration.

**Optical Drives** MultiBay II (9.5-mm) DVD-ROM MultiBay II Drive  
DVD/CD-RW Combo MultiBay II Drive  
DVD+/-RW SuperMulti MultiBay II Drive with Double Layer

## Standard Features

<b>Interfaces</b>	<b>PC Card Slot</b>	One Type I/II
	<b>Smart Card Reader</b>	One
	<b>External Monitor</b>	One – VGA
	<b>External Microphone</b>	One
	<b>Headphone/Line out</b>	One
	<b>Power Connector</b>	One
	<b>RJ-11 (Modem)</b>	One
	<b>RJ-45 (NIC)</b>	One
	<b>Fast Infrared Port</b>	One (4-Mb/s support) IrDA 4-MB compliant; IR performance will vary depending on performance of IR peripherals and application used.
	<b>S-Video TV Out</b>	One (Support for NTSC/PAL)
	<b>USB 2.0</b>	Three
	<b>Docking Connector</b>	One
	<b>Accessory Battery Connector</b>	One
	<b>LED Status Indicators</b>	Eleven

<b>Audio</b>	<p>PremierSound audio/speaker subsystem            ADI1981HD High Definition CODEC            Integrated 16-bit Sound Blaster Pro compatible audio            24-bit DAC            Integrated stereo speakers            Integrated microphone            External volume up, volume down, and mute buttons            Stereo headphone/line out            Stereo microphone in</p>
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<b>Software</b>	<p><b>Preinstalled Software with Windows Vista or Windows XP</b></p> <ul style="list-style-type: none"> <li>Adobe Acrobat Reader*</li> <li>HP Backup and Recovery Manager</li> <li>HP Help and Support Center*</li> <li>HP Mobile Print Driver* (Windows XP models)</li> <li>HP ProtectTools Security Manager*:               <ul style="list-style-type: none"> <li>BIOS Configuration for HP ProtectTools</li> <li>Embedded Security for HP ProtectTools</li> <li>Credential Manager for HP ProtectTools</li> </ul> </li> <li>HP Quick Launch Buttons</li> <li>HP Wireless Assistant</li> <li>HP OpenView Radia Management Solutions*</li> <li>Sonic Digital Media Plus* (Windows XP models):               <ul style="list-style-type: none"> <li>RecordNow! (for optional DVD+/-RW and DVD/CDRW drives)</li> <li>MyDVD (DVD Authoring for optional DVD+/-RW drives)</li> </ul> </li> <li>Roxio Creator 9 (Windows Vista models with optional DVD+/-RW or DVD/CDRW drives)</li> <li>Synaptics Touchpad Driver</li> <li>Symantec Norton Internet Security* with complimentary 60-day live update</li> <li>Intervideo WinDVD* – DVD Player (for optional DVD+/-RW, DVD/CDRW and DVD drives)</li> </ul>
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### Standard Features

**\*NOTE:** Software marked with an asterisk is loaded on the hard drive and can be installed by running the Software Setup utility.

<b>Additional software available from the Web</b>	HP Client Manager Software Smart Card Security for HP ProtectTools Device Access Manager for HP ProtectTools
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<b>HP Backup and Recovery Manager</b>	Each unit is shipped with HP Backup and Recovery Manager. HP Backup and Recovery Manager can provide data and system file protection for HP business PCs to enable fast recovery if the system becomes corrupted or if important information is accidentally deleted. HP Backup and Recovery Manager can perform scheduled or manual backups of the entire drive or individual files and folders. Up to 8 GB of the hard drive is reserved for the system recovery software. HP Backup and Recovery Manager can also create software recovery CDs or DVDs (requires optional hardware).
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<b>HP OpenView Radia Management Solutions</b>	HP OpenView Radia Management Solutions automate the management of software such as operating systems, software, software updates, content, and configuration settings to ensure that each computer is maintained in the correct configuration.
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<b>HP Client Management Interface</b>	HP Client Management Interface is based on industry standards that include Microsoft Windows Management Interface (MS WMI), Web Based Enterprise Management (WBEM), System Management BIOS (SMBIOS), and Advanced Configuration and Power Interface (ACPI). HP CMI is a foundation technology utilized in HP Client Management Solutions.
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<b>SMBIOS Version 2.4</b>	System Management BIOS, previously known as DMI BIOS, is used to store system management information.
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<b>HP ProtectTools Security Manager</b>	HP ProtectTools Security Manager is the security platform for business notebooks and desktops. The HP ProtectTools Security Manager is an extensible client security console that delivers enhanced security capabilities through add-on software modules. Modules currently available are:
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- Smart Card Security for HP ProtectTools
- BIOS Configuration for HP ProtectTools
- Credential Manager for HP ProtectTools
- Embedded Security for HP ProtectTools
- Device Access Manager for HP ProtectTools



## Standard Features

<b>Security</b>	<b>Standard Features</b>	<p>HP ProtectTools Security Manager          HP Biometric Fingerprint Sensor          Integrated Smart Card Reader          TPM 1.2 Embedded Security Chip*          Configuration Control Hardware          Memory Change Alert          Ownership Tag          Setup Password          Power-On Password          DriveLock          TPM Enhanced DriveLock*          HP Disk Sanitizer          Kensington Lock Slot          Support for Computrace / LoJack for Laptops (must be purchased separately)</p>
	<b>Optional Features</b>	<p><b>HP Privacy Filter</b>      Narrows viewing area so that screen data is visible only to persons directly in front of the monitor</p>

**\*NOTE:** TPM module disabled where use is restricted by law; for example, Russia.  
 For more information on HP security solutions refer to <http://www.hp.com/go/security>.

<b>Power Supply</b>	<p>External Smart AC Adapter (65-watt standard with integrated graphics; 90-watt standard with discrete graphics), 6-foot (1.8-meter) power cord included.          Total length including External AC adapter is 12 feet (3.66 meter).          HP Fast Charge Technology*</p>
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\*Fast Charge Technology recharges your battery up to 90% within 90 minutes when the system is off. Fast Charge Technology does not apply to 12-cell Ultra Capacity batteries.

<b>Battery</b>	<b>Primary Battery</b>	<p>55Wh 6-cell Lithium-Ion          37Wh 4-cell Lithium-Ion (available only on integrated graphics models)</p>
	<b>Optional HP 8-Cell Extended Life Battery</b>	52Wh 8-cell high capacity Lithium-Ion
	<b>Optional HP 12-Cell Ultra-Capacity Battery</b>	95Wh 12-cell high capacity Lithium-Ion

## Standard Features

Battery Life		<b>6-cell Primary with integrated graphics</b>	<b>6-cell Primary with discrete graphics</b>	<b>4-cell Primary with integrated graphics</b>
	<b>Primary Battery</b>	Up to 6 hours	Up to 4 hours and 30 minutes	Up to 3 hours and 30 minutes
	<b>Primary Battery and optional HP 8-Cell Extended Life Battery</b>	Up to 12 hours and 15 minutes	Up to 8 hours and 30 minutes	Up to 6 hours and 45 minutes
	<b>Primary Battery and optional HP 12-Cell Ultra-Capacity Battery</b>	Up to 16 hours and 15 minutes	Up to 13 hours	Up to 13 hours

**NOTE:** Battery life will vary depending on the product configuration, product model, applications loaded on the product, power management settings of the product, and the product features used by the customer. As with all batteries, the maximum capacity of this battery will decrease with time and usage.

**System Standby Time** Up to 1 week

**Power Conservation** Supports enhanced Intel SpeedStep technology with Intel Core Duo and Intel Core Solo processors (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)  
 Intel Display Power Saving technology (models with integrated graphics)  
 ATI PowerPlay technology (models with discrete graphics)  
 Hibernation  
 Standby  
 ACPI compliance

**Docking** HP Docking Station  
 HP Advanced Docking Station  
 HP External MultiBay II  
 HP Adjustable Notebook Stand

HP's shared docking solutions provide simple and convenient port replication and cable management. Features include Gigabit NIC pass through, modem pass through, legacy parallel and serial ports, S-video TV out, USB 2.0 ports, integrated security mechanism\*, integrated MultiBay II and ExpressCard\*\* slots. These docking solutions are compatible across multiple Business Notebook platforms enabling a lower total cost of ownership.

\* HP/Kensington Cable Lock required (purchased separately)  
 \*\* HP Advanced Docking Station only

**Service and Support** HP Services includes a three-year standard parts and labor warranty, pick-up or carry-in, and toll-free 7 x 24 hardware technical phone support. On-site service and warranty upgrades are also available.

**NOTE:** Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. <http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp>.

Select Model(s)

### Standard Features

<b>nc6400</b> RM100AW#XXX (may vary based on local regulatory requirements)	<b>Processor</b>	Intel Core 2 Duo Processor T5600*
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024 MB 667-MHz DDR2 (1 DIMM)
	<b>Hard Drive</b>	80-GB 5400 rpm SATA
	<b>Display</b>	14.1-inch WXGA
	<b>Graphics</b>	Intel Graphics Media Accelerator 950
	<b>Audio</b>	ADI High Definition CODEC line out/headphone and microphone jacks integrated microphone
	<b>Communications</b>	56K V.92 modem Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection (may vary based on local regulatory requirements) Bluetooth 2.0
	<b>Integrated Security</b>	TPM 1.2 Embedded Security Chip** HP Biometric Fingerprint Sensor Smart Card Reader
	<b>Pointing Device</b>	Dual pointing devices (both Pointstick and Touchpad)
	<b>MultiBay II Drive</b>	DVD/CD-RW Combo MultiBay II Drive
	<b>Battery</b>	6-cell (55 WHr) Lithium-Ion
	<b>Power</b>	External 65W adapter
<b>Warranty</b>	3/3/0	

\* Intel's numbering system is not a measurement of higher performance.

\*\* TPM module disabled where use is restricted by law; for example, Russia.

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<b>nc6400</b> RM106AW#XXX (may vary based on local regulatory requirements)	<b>Processor</b>	Intel Core 2 Duo Processor T7200*
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024 MB 667-MHz DDR2 (1 DIMM)
	<b>Hard Drive</b>	80-GB 5400 rpm SATA
	<b>Display</b>	14.1-inch WXGA
	<b>Graphics</b>	ATI Mobility Radeon 256MB HyperMemory**
	<b>Audio</b>	ADI High Definition CODEC line out/headphone and microphone jacks integrated microphone
	<b>Communications</b>	56K V.92 modem Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection (may vary based on local regulatory requirements) Bluetooth 2.0
	<b>Integrated Security</b>	TPM 1.2 Embedded Security Chip*** HP Biometric Fingerprint Sensor Smart Card Reader
	<b>Pointing Device</b>	Dual pointing devices (both Pointstick and Touchpad)
	<b>MultiBay II Drive</b>	DVD/CD-RW Combo MultiBay II Drive

### Standard Features

<b>Battery</b>	6-cell (55 WHr) Lithium-Ion
<b>Power</b>	External 90W adapter
<b>Warranty</b>	3/3/0

\* Intel's numbering system is not a measurement of higher performance.

\*\* 256MB HyperMemory is a total of 64MB dedicated video memory and 192MB shared system memory.

\*\*\* TPM module disabled where use is restricted by law; for example, Russia.

nc6400  
RC454AW#XXX  
(may vary based on local  
regulatory requirements)

<b>Processor</b>	Intel Core Duo Processor T2400*
<b>Operating System</b>	Genuine Windows XP Professional
<b>System Memory</b>	1024 MB 667-MHz DDR2 (1 DIMM)
<b>Hard Drive</b>	60-GB 5400 rpm SATA
<b>Display</b>	14.1-inch WXGA
<b>Graphics</b>	Intel Graphics Media Accelerator 950
<b>Audio</b>	ADI High Definition CODEC line out/headphone and microphone jacks integrated microphone
<b>Communications</b>	56K V.92 modem Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (10/100/1000 NIC)
<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection (may vary based on local regulatory requirements) Bluetooth 2.0
<b>Integrated Security</b>	TPM 1.2 Embedded Security Chip** HP Biometric Fingerprint Sensor Smart Card Reader
<b>Pointing Device</b>	Dual pointing devices (both Pointstick and Touchpad)
<b>MultiBay II Drive</b>	DVD/CD-RW Combo MultiBay II Drive
<b>Battery</b>	6-cell (55 WHr) Lithium-Ion
<b>Power</b>	External 65W adapter
<b>Warranty</b>	3/3/0

\* Intel's numbering system is not a measurement of higher performance.

\*\* TPM module disabled where use is restricted by law; for example, Russia.

## Standard Features

<b>nc6400</b> RA252AW#XXX (may vary based on local regulatory requirements)	<b>Processor</b>	Intel Core Duo Processor T2400*
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	512 MB 667-MHz DDR2 (1 DIMM)
	<b>Hard Drive</b>	60-GB 5400 rpm SATA
	<b>Display</b>	14.1-inch WXGA
	<b>Graphics</b>	Intel Graphics Media Accelerator 950
	<b>Audio</b>	ADI High Definition CODEC line out/headphone and microphone jacks integrated microphone
	<b>Communications</b>	56K V.92 modem Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection (may vary based on local regulatory requirements) Bluetooth 2.0
	<b>Integrated Security</b>	TPM 1.2 Embedded Security Chip** HP Biometric Fingerprint Sensor Smart Card Reader
	<b>Pointing Device</b>	Dual pointing devices (both Pointstick and Touchpad)
	<b>MultiBay II Drive</b>	DVD/CD-RW Combo MultiBay II Drive
	<b>Battery</b>	6-cell (55 WHr) Lithium-Ion
	<b>Power</b>	External 65W adapter
	<b>Warranty</b>	3/3/0

\* Intel's numbering system is not a measurement of higher performance.

\*\* TPM module disabled where use is restricted by law; for example, Russia.

<b>nc6400</b> RA253AW#XXX (may vary based on local regulatory requirements)	<b>Processor</b>	Intel Core Duo Processor T2500*
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	512 MB 667-MHz DDR2 (1 DIMM)
	<b>Hard Drive</b>	60-GB 5400 rpm SATA
	<b>Display</b>	14.1-inch WXGA
	<b>Graphics</b>	ATI Mobility Radeon 256MB HyperMemory**
	<b>Audio</b>	ADI High Definition CODEC line out/headphone and microphone jacks integrated microphone
	<b>Communications</b>	56K V.92 modem Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection (may vary based on local regulatory requirements) Bluetooth 2.0
	<b>Integrated Security</b>	TPM 1.2 Embedded Security Chip*** HP Biometric Fingerprint Sensor Smart Card Reader
	<b>Pointing Device</b>	Dual pointing devices (both Pointstick and Touchpad)
	<b>MultiBay II Drive</b>	DVD/CD-RW Combo MultiBay II Drive

## Standard Features

<b>Battery</b>	6-cell (55 WHr) Lithium-Ion
<b>Power</b>	External 90W adapter
<b>Warranty</b>	3/3/0

\* Intel's numbering system is not a measurement of higher performance.

\*\* 256MB HyperMemory is a total of 64MB dedicated video memory and 192MB shared system memory.

\*\*\* TPM module disabled where use is restricted by law; for example, Russia.

## Options

<b>Memory</b>	256-MB 533-MHz DDR2 SDRAM	PE830A
	512-MB 533-MHz DDR2 SDRAM	PE831A
	1024-MB 533-MHz DDR2 SDRAM	PE832A
	512-MB 667-MHz DDR2 SDRAM	EM993AA
	1024-MB 667-MHz DDR2 SDRAM	EM994AA
	2048-MB 667-MHz DDR2 SDRAM	EM995AA
<b>MultiBay II Storage</b> (9.5-mm)	DVD-ROM MultiBay II Drive	PA849A
	Combo DVD/CD-RW MultiBay II Drive	PA850A
	DVD+/-RW SuperMulti with Double Layer MultiBay II Drive	PA851A
	80-GB 5400 rpm MultiBay II Hard Drive	PH357A
<b>Other Storage</b>	80-GB 5400 rpm Primary SATA Hard Drive	ET354AA
	HP USB Digital Drive + 256-MB Secure Digital Card	DL702AA
	HP USB Diskette Drive	DC361B
<b>Communications</b>	Intel PRO/Wireless 3945ABG 802.11 a/b/g WLAN option kit	EX150AA#xxx
	HP ev2200 1xEV-DO Broadband Wireless Module (Verizon software)	EX149AA#ABA
	HP hs2300 HSDPA Broadband Wireless Module (Vodafone software)*	RN005AA#AC3
	HP hs2300 HSDPA Broadband Wireless Module (Cingular software)	RN052AA#ABA
<b>*NOTE:</b> SIM card comes with Vodafone service; not provided with HP module.		
<b>Expansion Solutions</b>	HP Docking Station	EN488AA#xxx
	HP Advanced Docking Station	EN489AA#xxx
	HP 3-in-1 NAS Docking Station	EM537AA#xxx
	HP Monitor Stand	PA507A
	HP Adjustable Notebook Stand	PA508A
	HP External MultiBay II (9.5-mm)	PA509A#xxx
	HP 4-port USB 2.0 Hub	DG954A

### Options

<b>Power</b>	HP 2-bay Battery Charging Station	DT533A#xxx
	HP 10-bay Battery Charging Station	DT534A#ABA
	Battery Adapter kit #1	PK402A
	65W Smart AC Adapter	ED494AA#xxx
	90W Smart AC Adapter	ED495AA#xxx
	90W Smart Auto Adapter	ED493AA
	65W Air/Auto/AC Combo Adapter	ED993AA#xxx
	Primary 6-cell Battery Pack	PB994A
	HP 8-cell Extended Life Battery	PB993A
HP 12-cell Ultra-Capacity Battery	EJ092AA	
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<b>Carrying Cases</b>	HP Entry Value Case	DL617A
	HP Top Load Nylon	DC915A
	HP Executive Leather case	PA847A
	HP Sport Backpack	DG102A
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<b>Security</b>	HP PCMCIA Smart Card Reader	DC350B
	HP/Kensington Cable Lock	PC766A
	Privacy Film for 6400 Series	ES216AA
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<b>Input/Output Devices</b>	USB/PS2 Keyboard	DC852A#xxx
	USB/PS2 Optical Mouse	DC369A
	HP USB Optical Travel Mouse	F2100A



## Memory

Support for up to 4096 MB\* of 533- or 667-MHz DDR2 SDRAM  
 Two DIMM slots  
 DIMM sizes supported: 256 MB, 512 MB, 1024 MB, and 2048 MB

- Standard Memory**
- 256 MB (256 MB x 1)
  - 512 MB (512 MB x 1 or 256 MB x 2)
  - 1024 MB (1024 MB x 1 or 512 MB x 2)
  - 2048 MB (1024 MB x 2)

**Optional Memory Upgrades** Support for up to 4096 MB\* of memory is available (with the installation of optional DDR2 SDRAM memory kits). Both memory slots are user accessible. Please refer to the Hardware and Software Guide for installation procedures. Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

Up to	Slot 1	Slot 2
768 MB	512 MB	256 MB
1024 MB	1024 MB	Empty
1024 MB	512 MB	512 MB
1280 MB	1024 MB	256 MB
1536 MB	1024 MB	512 MB
2048 MB	1024 MB	1024 MB
4096 MB*	2048 MB	2048 MB

**NOTE:** This chart does not represent all possible memory configurations. Due to the non-industry standard nature of some third-party memory modules, we strongly recommend using only HP branded memory modules to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

<b>Memory Upgrades</b>	256-MB 533-MHz DDR2 SDRAM	PE830A
	512-MB 533-MHz DDR2 SDRAM	PE831A
	1024-MB 533-MHz DDR2 SDRAM	PE832A
	512-MB 667-MHz DDR2 SDRAM	EM993AA
	1024-MB 667-MHz DDR2 SDRAM	EM994AA
	2048-MB 667-MHz DDR2 SDRAM	EM995AA

\* Above 3-GB, all memory may not be available due to system resource requirements.

## Storage

### Removable Media Drive Support

	Quantity Supported	Drive Bay
DVD+/-RW SuperMulti MultiBay II Drive with Double Layer*	One	MultiBay II
DVD/CD-RW Combo MultiBay II Drive*	One	MultiBay II
DVD-ROM MultiBay II Drive*	One	MultiBay II

### Hard Drive Support

	Quantity Supported	Drive Bay
<b>Primary Hard Drives</b>		
100-GB 7200 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
80-GB 7200 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
60-GB 7200 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
100-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
80-GB 5400 rpm SMART SATA Hard Drive	Up to two	Dedicated hard drive bay and/or MultiBay II
60-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay
40-GB 5400 rpm SMART SATA Hard Drive	One	Dedicated hard drive bay

\* MultiBay II drives supported in the internal MultiBay II are also supported in the optional HP External MultiBay II and the HP Advanced Docking Station.

## Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b>	1.1 (at front) x 13.0 x 9.4 in (29.2 (at front) x 330 x 239 mm)	
	<b>Weight</b>	with MultiBay II weight saver and 4-cell battery	4.4 lb (2.0 kg)
		with MultiBay II weight saver and 6-cell battery	4.6 lb (2.1 kg)
		with MultiBay II DVD/CDRW Combo Drive and 6-cell battery	5.0 lb (2.27 kg)
<p><b>NOTE:</b> Height varies depending upon where on the notebook the measurement is made. Weight includes integrated graphics, battery, 60-GB hard drive, 512-MB memory, 802.11 wireless communications module, and TPM Embedded Security Chip. Weight varies by configuration and components.</p>			
<b>Stand-Alone Power Requirements</b>	Normal Operating Voltage	18.5 V	
	Average Operating Power	22 W (models with integrated graphics) 29 W (models with discrete graphics)	
	Max Operating Power	< 65 W (models with integrated graphics) < 90 W (models with discrete graphics)	
<b>Temperature</b>	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)	
	Non-operating	-4° to 140° F (-20° to 60° C)	
<b>Relative Humidity</b>	Operating	10% to 90%, non-condensing	
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature	
<b>Shock</b>	Operating	125 G, 2 ms, half-sine	
	Non-operating	200 G, 2 ms, half-sine	
<b>Random Vibration</b>	Operating	0.75 grms	
	Non-operating	1.50 grms	
<b>Altitude (unpressurized)</b>	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)	
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)	
<b>Industry Standard Certifications</b>	UL	Yes	
	CSA	Yes	
	FCC Compliance	Yes	
	Energy Star Compliant	Yes	
	ICES	Yes	
	GS	Yes	
	Australia / NZ A-Tick Compliance	Yes	
	CCC	Yes	
	Japan VCCI Compliance	Yes	
	MIC	Yes	
	BSMI	Yes	
	CE Marking Compliance	Yes	
	BNCI or BELUS	Yes	
CIT	Yes		

### Technical Specifications

GOST	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

<b>HP 90W Smart AC Adapter</b> (models with discrete graphics)	<b>Dimensions</b>	5.24 x 2.28 x 1.1 in (13.3 x 5.8 x 2.9 cm)	
	<b>Weight</b>	0.86 lb (390 g)	
	<b>Input</b>	100 to 240 VAC	
		Input Efficiency	83% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.5 A at 90 VAC, 0.75 A at 180 VAC PFC Version 2.4 A at 90 VAC, 1.2 A at 180 VAC NON PFC Version
	<b>Output</b>	Output power 65W	90W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	<b>Connector</b>	3 pin/grounded, mates with interchangeable cords	
	<b>Environmental Design</b>	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
	Storage Humidity	10% to 90%	
<b>EMI and Safety Certifications</b>	CE Mark – full compliance with LVD and EMC directives; Worldwide safety standards – IEC950, EN60950, UL1950, Class2, SELV; Agency approvals – C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCIB, NOM-1 NYCE; MTBF– over 200,000 hours at 25°C ambient condition.		
<b>Option Kit Contents</b>	90W AC Adapter, power cable, warranty booklet		

### Technical Specifications

<b>HP 65W Smart AC Adapter</b> (models with integrated graphics)	<b>Dimensions</b>	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)	
	<b>Weight</b>	0.62 lb (280 g)	
	<b>Input</b>	Input	100 to 240 VAC
		Input Efficiency	83% min at 115 VAC
	<b>Output</b>	Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
		Output power 65W	65W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
		<b>Connector</b>	3 pin/grounded, mates with interchangeable cords
	<b>Environmental Design</b>	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
Storage Humidity		10% to 90%	
<b>EMI and Safety Certifications</b>	CE Mark – full compliance with LVD and EMC directives; Worldwide safety standards – IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals – C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF – over 200,000 hours at 25°C ambient condition.		
<b>Option Kit Contents</b>	65W AC Adapter, power cable, warranty booklet		

<b>Optional HP 12-Cell Ultra-Capacity Battery</b>	<b>Dimensions (H x W x L)</b>	1.3 x 6.0 x 10.6 in (3.33 x 15.25 x 26.88 cm)	
	<b>Weight</b>	1.77 lb (0.803 kg)	
	<b>Cells/Type</b>	12-cell Lithium-Ion	
	<b>Energy</b>	Voltage	14.8V
		Watt-hour Capacity	95Wh
		Amp-hour Capacity	6.45Ah
	<b>Temperature</b>	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Non-operating	-4° to 140° F (-20° to 60° C)
	<b>Battery Re-Charge Time</b>	Smart Adapter	3 to 4 hours
		System ON	4 to 5 hours (depending on system power consumption)
<b>Fuel Gauge</b>	When pressed, LEDs light indicating level of charge remaining on battery		

### Technical Specifications

Optional HP 8-Cell Extended Life Battery	Dimensions (H x W x L)	1.0 x 3.9 x 8.7 in (2.5 x 10.0 x 22.0 cm)		
	Weight	1.00 lb (0.455 kg)		
	Cells/Type	8-cell Lithium-Ion		
	Energy	Voltage	14.4V	
		Watt-hour Capacity	52Wh	
		Amp-hour Capacity	3.6Ah	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 140° F (-10° to 60° C)	
		Non-operating	-4° to 140° F (-20° to 60° C)	
	Battery Re-Charge Time	System in OFF mode or Standby	3 hours	
		System ON	3 to 5 hours (depending on system power consumption)	
		HP Fast Charge Technology	Charges the battery up to 90% within 90 minutes when system is OFF	
	Fuel Gauge	When pressed, LEDs light indicating level of charge remaining on battery		

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55Wh Primary 6-Cell Battery	Dimensions (H x W x L)	0.8 x 2.1 x 8.0 in (2.0 x 5.3 x 20.3 cm)		
	Weight	0.737 lb (0.335 kg)		
	Cells/Type	6-cell Lithium-Ion		
	Energy	Voltage	10.8V	
		Watt-hour Capacity	55Wh	
		Amp-hour Capacity	5.1Ah	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)	
		Operating (Discharging)	14° to 140° F (-10° to 60° C)	
		Non-operating	-4° to 140° F (-20° to 60° C)	
	Battery Re-Charge Time	System in OFF Mode or Standby	2.5 hours	
		System ON	3 to 5 hours (depending on system power consumption)	
		HP Fast Charge Technology	Charges the battery up to 90% within 90 minutes when system is OFF	

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### Technical Specifications

<b>37Wh Primary 4-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	0.8 x 2.1 x 8.0 in (2.0 x 5.3 x 20.3 cm)		
	<b>Weight</b>	0.55 lb (0.249 kg)		
	<b>Cells/Type</b>	4-cell Lithium-Ion		
	<b>Energy</b>	<b>Voltage</b>	14.4V	
		<b>Watt-hour Capacity</b>	37Wh	
		<b>Amp-hour Capacity</b>	2.55Ah	
	<b>Temperature</b>	<b>Operating (Charging)</b>	32° to 113° F (0° to 45° C)	
		<b>Operating (Discharging)</b>	14° to 140° F (-10° to 60° C)	
		<b>Non-operating</b>	-4° to 140° F (-20° to 60° C)	
	<b>Battery Re-Charge Time</b>	<b>System in OFF mode or Standby</b>	2.5 hours	
<b>System ON</b>		3 to 5 hours (depending on system power consumption)		
<b>HP Fast Charge Technology</b>		Charges the battery up to 90% within 90 minutes when system is OFF (does not apply to 12-cell Ultra-Capacity batteries)		

<b>14.1-Inch Color TFT WXGA Display</b>	<b>Active Area (W x H)</b>	11.9 x 7.5 in (30.3 x 19.0 cm)		
	<b>Diagonal Size</b>	14.1 in (35.7 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	300:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	200 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.237 mm	
		<b>Format</b>	1280x800	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	CCFL		
<b>PPI</b>	107			
<b>Viewing Angle</b>	±45° Horizontal, ±25° Vertical (typical)			

<b>14.1-Inch Color TFT WXGA+ Display</b>	<b>Active Area (W x H)</b>	11.9 x 7.5 in (30.3 x 19.0 cm)		
	<b>Diagonal Size</b>	14.1 in (35.7 cm)		
	<b>Surface Treatment</b>	Anti-glare		
	<b>Contrast Ratio</b>	300:1 (typical)		
	<b>Refresh Rate</b>	60 Hz		
	<b>Brightness</b>	200 nit (typical)		
	<b>Pixel Resolution</b>	<b>Pitch</b>	0.210 mm	
		<b>Format</b>	1440 x 900	
		<b>Configuration</b>	RGB Stripe	
	<b>Backlight</b>	CCFL		
<b>PPI</b>	121			
<b>Viewing Angle</b>	±45° Horizontal, ±25° Vertical (typical)			

## Technical Specifications

### Hard Drives

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100-GB 7200 rpm SATA	Drive Weight	0.25 lb (113 g)	
	Capacity	100 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1 ms
		Average	10 ms
		Maximum	18 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	195,371,568	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

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80-GB 7200 rpm SATA	Drive Weight	0.25 lb (113 g)	
	Capacity	80 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1 ms
		Average	10 ms
		Maximum	18 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

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### Technical Specifications

60-GB 7200 rpm SATA	Drive Weight	0.25 lb (113 g)	
	Capacity	60 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1 ms
		Average	10 ms
		Maximum	18 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	117,231,408	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

100-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	100 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	195,371,568	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

80-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	80 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	156,301,488	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

## Technical Specifications

60-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	60 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	117,231,408	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

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40-GB 5400 rpm SATA	Drive Weight	0.22 lb (101 g)	
	Capacity	40 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	78,165,360	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

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## Removable Storage Drives – MultiBay II

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## Technical Specifications

DVD-ROM MultiBay II Drive	<b>Dimensions</b>	0.37 x 5.51 x 5.04 in (0.95 x 14.0 x 12.8 cm)		
	<b>Weight</b>	0.45 lb (205 g)		
	<b>Access Times</b>	Random	<120 ms CD	
			<200 ms DVD	
	<b>Max Data Transfer Rate</b>	24X-CD-ROM	3,600 KB/s	
		8X-DVD	10,800 KB/s	
	<b>Transfer Mode</b>	Multiword DMA Mode 2		
	<b>Interface</b>	EIDE		
	<b>Supported Media (read)</b>	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW		
	<b>Supported Media (write)</b>	None		
	<b>Max Media Capacity (read)</b>	8.5 GB		
<b>Transport</b>	Tray Loading			

DVD/CD-RW Combo MultiBay II Drive	<b>Dimensions</b>	0.37 x 5.51 x 5.04 in (0.95 x 14.0 x 12.8 cm)		
	<b>Weight</b>	0.45 lb (205 g)		
	<b>Access Times</b>	Random	<120 ms CD	
			<155 ms DVD	
	<b>Max Data Transfer Rate</b>	24X CD-ROM	3,600 KB/s	
		8X DVD	10,800 KB/s	
		24X CD-R	3,600 KB/s	
		24X CD-RW	3,600 KB/s	
	<b>Transfer Mode</b>	Multiword DMA Mode 2		
	<b>Interface</b>	EIDE		
	<b>Supported Media (read)</b>	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW		
<b>Supported Media (write)</b>	CD-R, CD-RW			
<b>Max Media Capacity (read)</b>	8.5 GB			
<b>Max Media Capacity (write)</b>	700 MB			
<b>Transport</b>	Tray loading			

## Technical Specifications

DVD+/-RW SuperMulti MultiBay II Drive with Double Layer	<b>Dimensions</b>	0.37 x 5.51 x 5.04 in (0.95 x 14.0 x 12.8 cm)		
	<b>Weight</b>	0.45 lb (205 g)		
	<b>Access Times</b>	Random	<150 ms CD	
			<125 ms DVD	
	<b>Max Data Transfer Rate</b>	24X CD-ROM	3,600 KB/s	
		8X DVD	10,800 KB/s	
		24X CD-R	3,600 KB/s	
		10X CD-RW	1,500 KB/s	
		4X DVD+R	5,400 KB/s	
		2.4X DVD+RW	3,240 KB/s	
		4X DVD-R	5,400 KB/s	
		2X DVD-RW	2,700 KB/s	
		2X DVD-RAM	2,700 KB/s	
	<b>Transfer Mode</b>	Multiword DMA Mode 2		
	<b>Interface</b>	EIDE		
<b>Supported Media (read)</b>	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW			
<b>Supported Media (write)</b>	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM			
<b>Max Media Capacity (read)</b>	8.5 GB			
<b>Max Media Capacity (write)</b>	8.5 GB			
<b>Transport</b>	Tray Loading			

80-GB 5400 rpm MultiBay II Hard Drive	<b>MultiBay II Drive Adapter</b>	<b>Dimensions (H x W x D)</b>	0.37 x 5.51 x 5.04 in (0.95 x 14.0 x 12.8 cm)
		<b>Weight</b>	0.16 lb (72 g)
	<b>Drive Weight</b>	0.22 lb (101 g)	
	<b>Capacity</b>	80 GB	
	<b>Height</b>	0.37 in (9.5 mm)	
	<b>Width</b>	2.75 in (70 mm)	
	<b>Interface</b>	ATA-6	
	<b>Transfer Rate</b>	Synchronous (maximum)	100 MB/s (Drive Capability)
	<b>Seek Time</b> (typical reads, including settling)	Single Track	3 ms
		Average	13 ms
		Maximum	24 ms
	<b>Rotational Speed</b>	5400 rpm	
	<b>Logical Blocks</b>	156,301,488	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)		
<b>Features</b>	ATA Security		

## Technical Specifications

HP Fingerprint Sensor	Mobile Voltage Operation	3.0V–3.6V Single Supply
	Operating Temperature	32° – 158°F (0° – 70°C)
	Current Consumption @ 3.3V	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	High-Rate Image Capture	Up to 240 image frames /sec
	ESD Resistance	IEC 61000-4-2 Level 4 (±15KV)
	Detection Matrix	192 x 16 Pixels 9.7 mm x 0.81 mm 500 ppi High-Resolution Images

## PremierSound Audio

Hardware	Implementation	ADI1981HD High Definition CODEC
	Volume Controls	Up, down, and mute buttons
	Full Duplex	Yes
	Sound Blaster Pro compatible	Yes
	Microphone Jack	Stereo or mono
	Headphone/Line Out Jack	Stereo
	Integrated Microphone	Yes

Audio Output Quality	Frequency Response	20 Hz – 20 kHz
	Signal to Noise Ratio	>85 dB
	Total Harmonic Distortion	0.01%
	Noise Floor	-110 dB
	Play/Record Sampling Rate(s)	8 kHz – 48kHz
	DAC	16, 20 or 24-bit
	ADC	16 or 20-bit

Internal Speakers	Power Rating	2 Watts
	Impedance	4 Ohms

## Communications

## Technical Specifications

<b>Integrated Broadcom NetXtreme Gigabit Ethernet PCI Express Controller (BCM5753M)</b>	<b>Ethernet Features</b>	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3z and 802.3ab; IEEE 802.3 clauses 34-42) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)	
	<b>Power Management</b>	ACPI compliant -- multiple power modes Situation-sensitive features reduce power consumption NIC Battery Saving Mode (enabled by default)	
	<b>Performance Features</b>	TCP/IP/UDP Checksum Offload (configurable) TCP Segmentation Offload CPU Task Offload Adaptive Interrupts	
	<b>Manageability</b>	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Cable Analyzer	
	<b>Interface</b>	PCI Express x1	
	<b>NIC Device Driver Name</b>	Broadcom NetXtreme Gigabit Ethernet	
	<b>Drivers Available</b>	Microsoft Windows XP Microsoft Windows 2000	
	<hr/>		
	<b>V.92 56K Data/Fax Modem</b>	<b>Form Factor</b>	MDC 1.5 Daughtercard
		<b>Power Management Support</b>	APM Revision 1.2, ACPI
	<b>Approvals/Certifications</b>	UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries	

## Technical Specifications

<b>Data Mode Capabilities</b>	V.92 data V.8bis V.80 V44, V.42bis, MNP5 (Compression) V.42 (LAPM, MNP2-4) (Error Correction) <b>Optional symbol rates:</b> 2800, 3429 Asymmetric Symbol rates <b>Synchronous primary channel data signaling rates:</b> 3600, 31200 Automatic rate re-negotiation V.34 V.32bis V.32 V.23 V.22bis V.22 V.21 Bell 212A Bell 103J
<b>Fax Mode Capabilities</b>	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2
<b>Command Set</b>	V.250 (Partial) TIA-602 Identification: +GMI, +GMM, +GMR Port control: +IPR, +ICF, +IFC, +ILRR Modulation: +MS, +MR, +MA Error control: +ES, +ER, +EB, +ESR, +ETBM Data compression: +DS, +DR V.251

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## Technical Specifications

<b>HP ev2200 1xEV-DO Broadband Wireless Module</b>	<b>Band and Power Class</b>	0 (North American Cellular) – Class III; 1 (North American PCS) – Class II
	<b>Wireless Protocol Standards</b>	CDMA 1x Release 0/A; IS-95A, IS-95B, IS-2000
	<b>Wireless Parametric Standards</b>	Meets or exceeds TIA/EIA IS-98-D
	<b>Interoperability</b>	CDG 22 (TIA/EIA/IS-95-A) CDG 53(TIA/EIA/IS-95-B) C.S0031 (TIA/EIA/IS-2000) CDG 64 (TIA/EIA/IS-2000) C.S0032 (TIA/EIA/IS-866)
	<b>Frequency Band</b>	Dual Band: 800 MHz (Cellular) and 1900 MHz (PCS)
	<b>Data Rates (Packet Mode)</b>	IS-856 rates up to 2.4 Mbps IS-2000 data rates up to 307.2 kbps
	<b>Chipset and Module</b>	Qualcomm MSM6500 chipset; Sierra Wireless MC5720 module
	<b>Maximum Output Power</b>	24dBm (+/-1)
	<b>Power Consumption (maximum)</b>	500mA
	<b>Power Consumption, Sleep Mode</b>	1.7mA – 3.5mA
	<b>Power Management</b>	USB selective suspend CDMA slotted mode sleep and dormant modes
	<b>Antenna Type</b>	High efficiency dual band antennae with spatial diversity, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express MiniCard
	<b>Weight</b>	0.35 oz (10 g)
	<b>Dimensions (Length x Width x Thickness)</b>	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 10%
	<b>Temperature, Operating (from TIA/EIA/IS-98-D)</b>	-22° to 140° F (-30° to 60° C) (full RF performance) -22° to 167° F (-30° to 75° C) (reduced RF performance)
	<b>Temperature, Non- operating, 96 hours (from MIL-STD 202 Method 108)</b>	-40° to 185° F (-40° to 85° C)
	<b>Humidity, Non-operating</b>	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	<b>Configuration Utilities</b>	Verizon Wireless VZAccess Manager
	<b>LED Activity</b>	LED Off – Radio Off; Solid LED On – Radio On



## Technical Specifications

<b>HP hs2300 HSDPA Broadband Wireless Module</b>	<b>Frequency Bands and Power Class</b>	850/1900/2100MHz WCDMA Power class 3 (+24dBm) 850MHz GSM/GPRS/EDGE 900MHz GSM/GPRS/EDGE, 1800MHz GSM/GPRS/EDGE 1900MHz GSM/GPRS/EDGE EDGE E2 power GPRS/EDGE Multislot Class 12 GPRS PCS/DCS power class 1 GSM power class 4
	<b>Wireless Protocol Standards</b>	GPRS/EDGE: 3GPP R99 GERAN P1 WCDMA Release 5 (R5) High-Speed Downlink Packet Access (HSDPA) 3.6Mbps GSM Phase 2+
	<b>Wireless Parametric Standards</b>	Complies with 3GPP specifications
	<b>Additional Standards Compliance</b>	FCC parts 15/22/24, CE, Microsoft WHQL, R&TTE directive 1999/5/EC (health, safety, EMC, spectrum), GCF-CC (Module), European Union Directive 2002/95/EC (restrictions of the use of certain Hazardous Substances (RoHS) in electronic equipment), Infrastructure Interoperability Testing (IOT)
	<b>Data Rates (Packet Mode)</b>	Designed maximum data rate: EDGE 118 kbps UL / 236 kbps DL UMTS 384 kbps UL / 384 kbps DL HSDPA 384 kbps UL / 3.6 Mbps DL
	<b>Chipset and Module</b>	Qualcomm MSM6280 chipset; Sierra Wireless MC8775 module
	<b>Maximum Output Power</b>	32 dBm (+/-2) GSM/EDGE GMSK mode
	<b>Power Consumption (maximum)</b>	800mA
	<b>Power Consumption, Sleep Mode</b>	4 – 8mA
	<b>Power Management</b>	USB Selective Suspend sleep and standby mode
	<b>Antenna Type</b>	High efficiency 5- band antennae, mounted in the display enclosure
	<b>Form Factor</b>	PCI-Express MiniCard
	<b>Weight</b>	0.35 oz (10 g)
	<b>Dimensions (Length x Width x Thickness)</b>	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
	<b>Voltage, Operating</b>	3.3v +/- 10%
	<b>Temperature, Operating</b>	-22° to 140° F (-30° to 60° C) (full RF performance) -22° to 167° F (-30° to 75° C) (reduced RF performance)
	<b>Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)</b>	-40° to 185° F (-40° to 85° C)
	<b>Humidity, Non-operating</b>	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	<b>LED Activity</b>	LED Off – Radio Off; Solid LED On – Radio On
	<b>Configuration Utilities</b>	Varies per country and mobile network operator

## Technical Specifications

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<b>Broadcom 4311BG 802.11b/g WiFi Adapter</b>	<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP- MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.
		Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power (for CCK)<sup>2</sup></b>	17.5 dBm
	<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm
	<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.5 W (max) Idle mode <sup>3</sup> : 390 mW (nominal) Sleep mode: 20 mW (max)
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
	<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm
	<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
	<b>Range</b>	802.11 b – Typical                      1200 feet – Outdoor Open Area (@1 Mbps)                                300 feet – Indoor, Office environment 802.11 g – Typical                      1200 feet – Outdoor Open Area (@1 Mbps)                                300 feet – Indoor, Office environment
	<b>Form Factor</b>	PCI-Express MiniCard
	<b>Weight</b>	0.026 lb (12 g)
	<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)
	<b>Operating Voltage</b>	3.3v +/- 10%
	<b>Temperature</b>	Operating                                32° to 176° F (0° to 80° C) Non-operating                           -40° to 176° F (-40° to 80° C)

### Technical Specifications

<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility:	
	<ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support)</li> </ul>	
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. In Power Save Polling mode.</li> <li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> <li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.</li> </ol>	

#### Broadcom 4311AG 802.11a/b/g WiFi Adapter

<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g
<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
<b>Frequency Band</b>	2.4 GHz and 5 GHz
<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
<b>Output Power (for CKK)<sup>2</sup></b>	17.5 dBm
<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm

## Technical Specifications

<b>Power Consumption</b>	Transmit: 2.0 W (max) Receive: 1.5 W (max) Idle mode <sup>3</sup> : 390 mW (nominal) Sleep mode: 20 mW (max)	
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
<b>Range</b>	802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment
	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	0.026 lb (12 g)	
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility: <ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Broadcom Wireless Configuration Utility (required for Cisco Compatible Extensions support)</li> </ul>	
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. In Power Save Polling mode.</li> <li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> <li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.</li> </ol>	

Intel PRO/Wireless  
3945ABG 802.11a/b/g  
Network Connection

<b>Wireless LAN Standards</b>	IEEE 802.11a IEEE 802.11b IEEE 802.11g
<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
<b>Frequency Band</b>	2.4 GHz and 5 GHz
<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

## Technical Specifications

<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM	
<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).	
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.	
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK	
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
<b>Roaming</b>	IEEE 802.11 compliant roaming between access points	
<b>Output Power (for CCK)<sup>2</sup></b>	15 dBm	
<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm	
<b>Power Consumption</b>	Transmit: 1.8 Watts (max) Receive: 1.4 Watts (max) Idle mode <sup>3</sup> : 150 mW (nominal) Sleep mode: 30 mW (max)	
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	
<b>Range</b>	802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment
	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	0.013 lb (6 g)	
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)

## Technical Specifications

- Configuration Utility<sup>5</sup>** Choice of Configuration Utility:
- Microsoft Windows XP Wireless Network Connection Manager
  - Intel PROSet (required for Cisco Compatible Extensions support)
- LED Activity** LED Off – Radio OFF; Solid LED On – Radio ON
1. Check latest software/driver release for updates on supported security features.
  2. Maximum output power may vary by country according to local regulations.
  3. In Power Save Polling mode.
  4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
  5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.

<b>Intel PRO/Wireless 3945BG 802.11b/g Network Connection</b>	<b>Wireless LAN Standards</b>	IEEE 802.11b IEEE 802.11g
	<b>Interoperability</b>	Wi-Fi certified Cisco Compatible Extensions Program compliant (details at <a href="http://www.hp.com/go/notebooks/WLAN">www.hp.com/go/notebooks/WLAN</a> )
	<b>Frequency Band</b>	2.4 GHz
	<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	<b>Security<sup>1</sup></b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM.  Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
	<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points
	<b>Output Power (for CKK)<sup>2</sup></b>	15 dBm
	<b>Output Power (for OFDM; power varies by data rate)<sup>2</sup></b>	15 dBm
	<b>Power Consumption</b>	Transmit: 1.8 Watts (max) Receive: 1.4 Watts (max) Idle mode <sup>3</sup> : 150 mW (nominal) Sleep mode: 30 mW (max)
	<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode
<b>Receiver Sensitivity<sup>4</sup></b>	54 Mbps: -72 dBm, 11 Mbps: -88 dBm , 1 Mbps: -97 dBm	
<b>Antenna type</b>	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure	

### Technical Specifications

<b>Range</b>	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
<b>Form Factor</b>	PCI-Express MiniCard	
<b>Weight</b>	0.013 lb (6 g)	
<b>Dimensions</b>	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
<b>Operating Voltage</b>	3.3v +/- 10%	
<b>Temperature</b>	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
<b>Altitude</b>	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
<b>Configuration Utility<sup>5</sup></b>	Choice of Configuration Utility: <ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Intel PROSet (required for Cisco Compatible Extensions support)</li> </ul>	
<b>LED Activity</b>	LED Off – Radio OFF; Solid LED On – Radio ON	
	<ol style="list-style-type: none"> <li>1. Check latest software/driver release for updates on supported security features.</li> <li>2. Maximum output power may vary by country according to local regulations.</li> <li>3. In Power Save Polling mode.</li> <li>4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).</li> <li>5. WLAN supplier's client utility is required for Cisco Compatible Extensions support. WLAN may also be compatible with certain third-party software supplicants.</li> </ol>	

### HP Integrated Module with Bluetooth Wireless Technology

<b>Bluetooth Specification</b>	2.0 Compliant
<b>Dimensions</b>	1.02 x 0.55 x 0.22 in (26 x 14 x 5.7 mm)
<b>Frequency Band</b>	2402 to 2480 MHz
<b>Number of Available Channels</b>	79 (1 MHz) available channels
<b>Data Rates and Throughput</b>	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
<b>Transmit Power</b>	-6 dBm to 4 dBm (Bluetooth Class II)
<b>Receiver Sensitivity</b>	Better than -80 dBm at 0.1 % raw bit error rate
<b>Power Consumption</b>	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 mW
<b>Antenna</b>	Internally integrated within module
<b>Range</b>	Up 33 ft (10 m)
<b>Electrical Interface</b>	USB 2.0 compliant Microsoft Windows Plug and Play compliant
<b>OS Support</b>	Microsoft Windows XP Professional and Home

## Technical Specifications

	Microsoft Windows 2000
<b>Bluetooth Software Supported</b>	Broadcom Bluetooth for Windows Microsoft Windows XP Bluetooth Software
<b>Link Topology</b>	Point to Point, Multipoint Pico Nets up to 7 slaves
<b>Security</b>	Full support of Bluetooth Security Provisions
<b>Power Management</b>	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
<b>Certifications</b>	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
<b>Temperature</b>	Operating -4° to 158° F (-20° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
<b>Humidity</b>	Operating 10% to 90% Non-operating 5% to 95%
<b>Altitude</b>	Operating 15,000 ft (4,572 m) Non-operating 40,000 ft (12,192 m)
<b>Bluetooth Profiles Supported</b>	(with Bluetooth for Windows 4.0 software) Serial Port Profile (SPP)* Dial-Up Networking (DUN)* Generic Object Exchange Profile (GOEP) Object Push Profile (OPP)* File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP)* Personal Area Networking Profile (PAN)* Human Interface Device Profile (HID)* FAX Profile (FAX) Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

\* indicates the profile is also supported by Microsoft Windows XP SP2



## Technical Specifications

**Environmental Data**      **Eco-Label Certifications**      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
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration

**System Configuration**      The configuration used for the Energy Consumption and Declared Noise Emissions data is based on a "Typically Configured Notebook."

<b>Energy Consumption</b>	<b>115 VAC</b>	<b>230 VAC</b>	<b>100 VAC</b>
Normal Operation	25.6 W	25.6 W	25.6 W
Sleep (Energy Star low power mode)	2.1 W	2.6 W	2.1 W
Off	2.0 W	2.4 W	2.0 W
<b>Heat Dissipation*</b>	<b>115 VAC</b>	<b>230 VAC</b>	<b>100 VAC</b>
Normal Operation	87.3 BTU/hr	87.3 BTU/hr	87.3 BTU/hr
Sleep	7.2 BTU/hr	8.9 BTU/hr	7.2 BTU/hr
Off	6.8 BTU/hr	7.2 BTU/hr	6.8 BTU/hr

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

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

<b>Declared Noise Emissions</b> (in accordance with ISO 7779 and ISO 9296)	<b>Sound Power</b> (LWAd, bels)	<b>Sound Pressure</b> (LpAm, decibels)
Idle	3.40	25.1
Fixed Disk (random writes)	3.43	34.1

**Batteries**      This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000 ppm by weight.

Battery type and chemistry used in the product:

- Primary battery
- 6-cell or 4-cell high capacity Lithium-Ion battery pack
- Real Time Clock battery
- CR2032L/DBE (coin cell), Lithium

### Technical Specifications

**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.

Keyboard complies with ISO standard: ISO 9995, EN 29241-4, and ISO/IEC 15412

Input devices of this product comply with ISO 9241, part 9.

Plastics parts weighing over 0.055 pounds (25 grams) used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% recycled materials (by wt.)

This product is greater than 94% recycle-able when properly disposed of at end of life.

### Packaging

#### Packaging Materials

- External:
  - Corrugated Paper – 0.89 lb (402 g)
- Internal:
  - Corrugated – 0.10 lb (46 g)
  - PET Bag– 0.03 lb (15 g)
- The plastic packaging material is made from at least 20% post-consumer recycled content.
- The corrugated paper packaging materials contains at least 80% recycled content.

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.

## Technical Specifications

### Material Usage

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment

([http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen\\_specifications.html](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)

### End-of-life Management and Recycling

HP offers our customers several other options for handling their aging computers while also minimizing the impact on the environment-including product trade-in and leasing services-in addition to recycling services. Please go to: <http://www.hp.com/recycle>, or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

### Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>  
Environment website

<http://www.hp.com/environment>

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>

## *Technical Specifications*

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