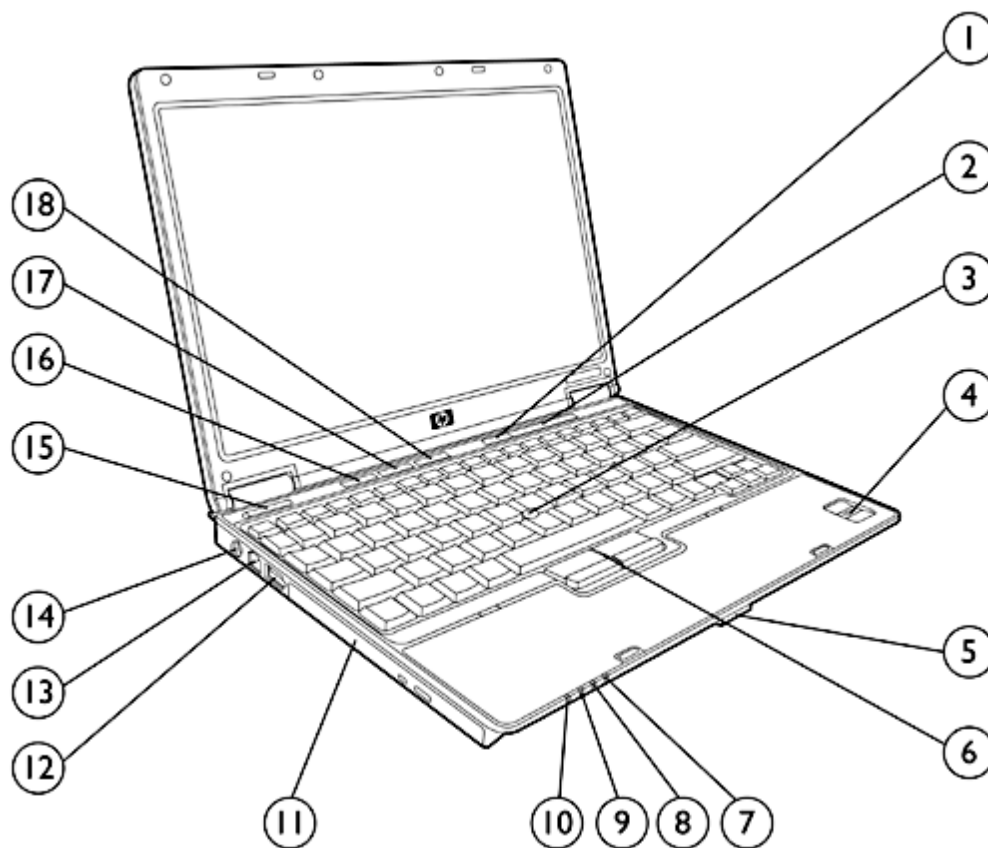
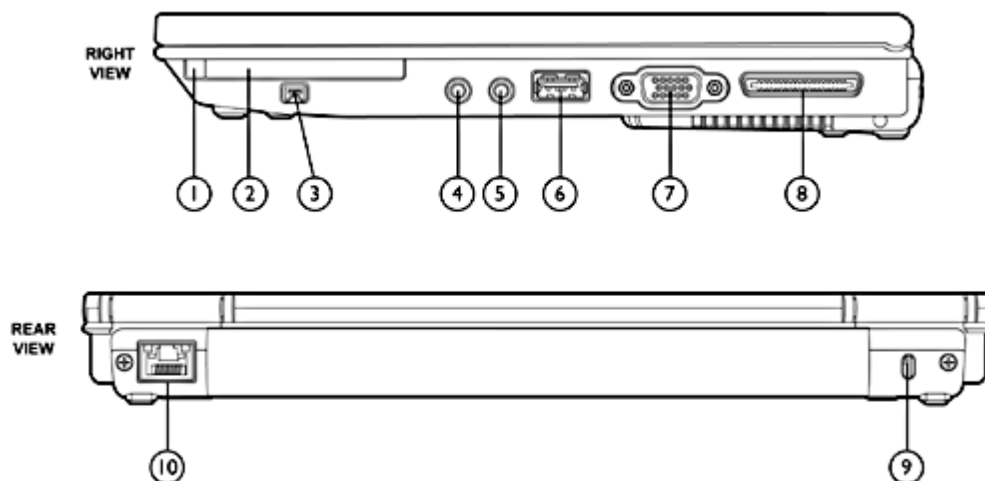


HP recommends Windows Vista®  
Business



1. Volume Mute Button with LED
2. Volume Scroll Zone with Up/Down LED Indicators
3. Pointstick
4. HP Fingerprint Sensor
5. Speaker
6. Left and Right Pointstick Buttons
7. Hard Drive Activity LED
8. Battery Charging LED
9. Power/Standby LED
10. Wireless On/Off LED
11. Optical Drive (select models)
12. USB 2.0 Port (powered on select models)
13. RJ-11 (modem) Jack
14. Power Connector
15. Power Button with LED
16. HP Info Center Button with LED
17. Wireless On/Off Button with LED
18. Presentation Mode Button with LED

## Overview



- |   |                                   |
|---|-----------------------------------|
| 1. PC Card Eject Button                                 | 6. USB 2.0 Port                   |
| 2. PC Card Slot (or smart card reader on select models) | 7. VGA/External Monitor Connector |
| 3. IEEE 1394 Port                                       | 8. Docking Connector              |
| 4. Headphone Jack                                       | 9. Kensington Lock Slot           |
| 5. Microphone Jack                                      | 10. RJ-45 Port (NIC)              |

## At A Glance

- Genuine Windows Vista Business 32, Genuine Windows Vista Home Basic 32, Genuine Windows XP Professional, Genuine Windows XP Home Edition (select countries only), or FreeDOS
- Intel® Core™ Duo ULV and Intel Core Solo ULV processors
- Starting at 2.8 lb/1.29 kg
- 12.1-inch WXGA display
- Integrated optical drive support on select models
- Mobile Intel 945GM Express Chipset
- 512-MB to 2048-MB DDR2 SDRAM
- Up to 80-GB 4200 rpm, user-removable hard drive
- Intel Graphics Media Accelerator 950
- Broadcom NetLink Gigabit Ethernet PCI Controller
- Optional integrated 802.11 a/b/g or 802.11 b/g wireless LAN module
- Optional integrated Bluetooth
- HP Mobile Data Protection System 3D
- Touch-sensitive controls
- Security features include integrated HP Fingerprint Sensor, Trusted Platform Module (TPM) Embedded Security Chip\*, and optional integrated Smart Card Reader
- Protected by a three-year standard parts and labor warranty – certain restrictions and exclusions apply.

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

### Standard Features

<b>Processors</b>		Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache) Intel Core Solo Processor U1400* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache) Intel Core Solo Processor U1300* (1.06-GHz, 533-MHz FSB, 2-MB L2 cache) <i>* Intel's numbering is not a measurement of higher performance.</i> <b>NOTE:</b> Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
<b>Operating System</b>	<b>Preinstalled</b>	Genuine Windows Vista Business 32* Genuine Windows Vista Home Basic 32* Genuine Windows XP Professional SP2 Genuine Windows XP Home Edition SP2 (select countries only) FreeDOS
	<b>Supported</b> (select drivers available on <a href="http://www.hp.com">http://www.hp.com</a> )	Genuine Windows Vista Enterprise 32* Genuine Windows 2000
	<b>Certified</b>	SuSE Linux Enterprise Desktop 10
		<i>* Certain Windows Vista product features require advanced or additional hardware. See <a href="http://www.microsoft.com/windowsvista/getready/hardwarereqs.msp">http://www.microsoft.com/windowsvista/getready/hardwarereqs.msp</a> and <a href="http://www.microsoft.com/windowsvista/getready/capable.msp">http://www.microsoft.com/windowsvista/getready/capable.msp</a> 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 <a href="http://www.windowsvista.com/upgradeadvisor">http://www.windowsvista.com/upgradeadvisor</a>.</i>
<b>Chipset</b>		Mobile Intel 945GM Express Chipset
<b>Graphics</b>		Intel Graphics Media Accelerator 950, with up to 224-MB shared system memory Microsoft DirectX 9 capable
<b>Display</b>	<b>Internal</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>External</b>	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 <b>NOTE:</b> Resolutions are dependent upon monitor capability, and resolution and color depth settings.
<b>Memory</b>	<b>Standard</b>	512-MB, 1024-MB or 2048-MB 533-MHz; one SODIMM slot
	<b>Maximum</b>	Up to 2048-MB maximum

### Standard Features

**Communications** Integrated Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)\* with HP Smart Power NIC technology  
56K V92 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 options featuring support for the latest industry standards. Integrated Bluetooth is also an option (factory configurable only) and can be combined with any one of the supported wireless LAN options.

<b>All integrated wireless LAN options</b>	Wi-Fi certified Cisco Compatible Extensions support (Version 4.0) 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
<b>Intel PRO/Wireless 3945ABG Network Connection</b>	Intel Centrino mobile technology Integrated support for 802.11a, b and g Up to 54-mbps data rate
<b>Broadcom 4311AG WiFi Adapter</b>	Integrated support for 802.11a, b and g Up to 54-mbps data rate
<b>Broadcom 4311BG WiFi Adapter</b>	Integrated support for 802.11 b and g Up to 54-mbps data rate
<b>HP Integrated Module with Bluetooth 2.0 Wireless Technology</b>	Bluetooth Specification v2.0 compliant Works with a wide range of Bluetooth devices

**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.

**Touch-sensitive Controls** Provide easy access to the following features: HP Info Center, Wireless On/Off, Presentation Mode, Volume Up/Down, and Volume Mute.

**Pointing Device** Pointstick with two soft-touch buttons

### Standard Features

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

Storage	Hard Drives	40-, 60-, 80-GB 4200 rpm SMART
	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.
	<b>NOTE:</b> These hard drives are customer removable and will withstand multiple insertion/removal cycles. Up to 8 GB is reserved for the system recovery software.	
	Fixed Optical Drives	DVD/CD-RW Combo DVD+/-RW SuperMulti with Double Layer

Interfaces	PC Card Slot	One – Type I/II or optional Smart Card Reader
	External Monitor	One – VGA
	External Microphone	One
	Headphone/Line out	One
	Power Connector	One
	RJ-11 (Modem)	One
	RJ-45 (NIC)	One
	USB 2.0	Two (including one powered USB 2.0 port to support HP External MultiBay II on units without an integrated optical drive)
	Docking Connector	One
	IEEE 1394a Port (4-pin)	One
LED Status Indicators	Sixteen	

Audio	ADI High Definition CODEC Integrated 16-bit Sound Blaster Pro compatible audio Integrated speaker External volume up/down scroll, and mute button Stereo headphone/line out Stereo microphone in
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### Standard Features

<b>Software</b>	<p><b>Preloaded Software</b></p> <p>Microsoft Windows XP</p>	<p>Adobe Acrobat Reader*</p> <p>HP Backup and Recovery Manager</p> <p>HP Help and Support Center*</p> <p>HP Mobile Print Driver*</p> <p>HP ProtectTools Security Manager*:</p> <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> <p>HP One-Touch Button Software</p> <p>HP Wireless Assistant</p> <p>HP OpenView Radia Management Solutions*</p> <p>Sonic Digital Media Plus*:</p> <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> <p>Synaptics Touchpad Driver</p> <p>Symantec Norton Internet Security* with complimentary 60-day live update</p> <p>Intervideo WinDVD* - DVD Player (for optional DVD+/-RW, DVD/CDRW and DVD drives)</p> <p><b>*NOTE:</b> software marked with an asterisk is loaded on the hard drive and can be installed by running the Software Setup utility.</p>
	<p><b>Additional software available from the Web</b></p>	<p>HP Client Manager Interface</p> <p>Smart Card Security for HP ProtectTools</p> <p>Device Access Manager for HP ProtectTools</p>

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**HP Client Management Interface** 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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**SMBIOS Version 2.4** System Management BIOS, previously known as DMI BIOS, is used to store system management information.

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**HP Backup and Recovery Manager** 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. HP Backup and Recovery Manager can also create software recovery CDs or DVDs (requires optional hardware).

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**HP OpenView Radia Management Solutions** 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.

## Standard Features

**HP ProtectTools Security Manager** 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:

- Smart Card Security for HP ProtectTools
- BIOS Configuration for HP ProtectTools
- Embedded Security for HP ProtectTools
- Credential Manager for HP ProtectTools
- Device Access Manager for HP ProtectTools

<b>Security</b>	<b>Standard Features</b>	<p>HP ProtectTools Security Manager          HP Fingerprint Sensor          Configuration Control Hardware          Memory Change Alert          Ownership Tag          Setup Password          Power-On Password          DriveLock          TPM Enhanced DriveLock*          HP Disk Sanitizer          Enabled for PC Smart Card options          Kensington Lock Slot          Support for Computrace / LoJack for Laptops (must be purchased separately)</p> <p><b>TPM 1.2 Embedded Security Chip*</b></p> <p>Designed to the Trusted Computing Group (TCG) standard          Microsoft Crypto API and PKCS#11 software interface support          RSA Secured Partner program certification  <b>*NOTE: Full functionality of the TPM Embedded Security Chip is available only with Windows XP Professional. TPM module disabled where use is restricted by law; for example, Russia.</b></p>
	<b>Optional Features</b>	<p><b>Smart Card Reader</b>          (replaces PC card slot)</p> <p>Compatible with ISO 7816 compliant Smart Cards          PC/SC interface support</p> <p>For more information on HP security solutions refer to <a href="http://www.hp.com/go/security">http://www.hp.com/go/security</a>.</p>

**Power Supply** External 65-watt Smart AC adapter, 6-foot (1.8-meter) power cord included. Total length including External AC adapter is 12 feet (3.66 meter). HP Fast Charge technology\*

\* Fast Charge Technology recharges your battery up to 90% within 90 minutes when the system is off. Fast Charge Technology does not apply to 9 cell primary batteries.

<b>Battery</b>	<b>Primary Battery</b>	<p>3-cell (28Wh) high capacity Lithium-Ion          6-cell (55Wh) high capacity Lithium-Ion          9-cell (83Wh) high capacity Lithium-Ion</p> <p><b>Battery Fuel Gauge LEDs</b> 6-cell high capacity and 9-cell high capacity</p>
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### Standard Features

Battery Life	3-cell Primary Battery	Up to 3 hours
	6-cell Primary Battery	Up to 6 hours 15 minutes
	9-cell Primary Battery	Up to 10 hours
<b>NOTE:</b> 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	

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Power Conservation	Supports enhanced Intel SpeedStep technology with Intel Core Solo processors (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode) Intel Display Power Saving technology HP Smart Power NIC technology Hibernation Standby ACPI compliance	
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MultiBay II Devices (optional)	MultiBay II devices used in the optional HP External MultiBay II may be swapped with the system powered on (hot) under Microsoft Windows XP Professional, Windows XP Home, or Windows 2000 (except MultiBay II secondary hard drive).	
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Docking (optional)	HP 2400 Series Docking Station	
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Service and Support	HP Services includes a three-year standard parts and labor warranty (Primary Battery – one-year 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. <b>NOTE:</b> Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. <a href="http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp">http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp</a> .	
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### Select Model(s)

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### Standard Features

<b>nc2400</b> RM140UT#ABA Smart Buy	<b>Processor</b>	Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache)
	<b>Operating System</b>	Genuine Windows Vista Business 32
	<b>System Memory</b>	1024-MB 533-MHz DDR2 SDRAM
	<b>Hard Drive</b>	60-GB 4200 rpm SMART
	<b>Display</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>Graphics</b>	Intel Graphics Media Accelerator 950, with up to 224-MB of shared system memory
	<b>Audio</b>	ADI High Definition CODEC, Line out/headphone and microphone jacks
	<b>Optical Drive</b>	9.5-mm DVD +/- RW
	<b>Communications</b>	Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection Bluetooth
	<b>Integrated Security</b>	TPM 1.2 Embedded Standard Security Chip** HP Fingerprint Sensor
	<b>Pointing Device</b>	Pointstick Bluetooth Mouse
	<b>Battery</b>	3-cell (28Wh) high capacity Lithium-Ion
	<b>Power</b>	65W Smart AC Adapter
	<b>Warranty</b>	3/3/0

<b>nc2400</b> RM075AW#ABA	<b>Processor</b>	Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache)
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024-MB 533-MHz DDR2 SDRAM
	<b>Hard Drive</b>	60-GB 4200 rpm SMART
	<b>Display</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>Graphics</b>	Intel Graphics Media Accelerator 950, with up to 224-MB of shared system memory
	<b>Audio</b>	ADI High Definition CODEC, Line out/headphone and microphone jacks
	<b>Optical Drive</b>	9.5-mm DVD/CD-RW Combo
	<b>Communications</b>	Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection Bluetooth
	<b>Integrated Security</b>	TPM 1.2 Embedded Standard Security Chip** HP Fingerprint Sensor
	<b>Pointing Device</b>	Pointstick
	<b>Battery</b>	6-cell (55Wh) high capacity Lithium-Ion
	<b>Power</b>	65W Smart AC Adapter
	<b>Warranty</b>	3/3/0

### Standard Features

<b>nc2400</b> RM138UA#ABA	<b>Processor</b>	Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache)
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024-MB 533-MHz DDR2 SDRAM
	<b>Hard Drive</b>	80-GB 4200 rpm SMART
	<b>Display</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>Graphics</b>	Intel Graphics Media Accelerator 950, with up to 224-MB of shared system memory
	<b>Audio</b>	ADI High Definition CODEC, Line out/headphone and microphone jacks
	<b>Optical Drive</b>	9.5-mm DVD +/- RW
	<b>Communications</b>	Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection Bluetooth
	<b>Integrated Security</b>	TPM 1.2 Embedded Standard Security Chip** HP Biometric Sensor
	<b>Pointing Device</b>	Pointstick
	<b>Battery</b>	9-cell (83Wh) high capacity Lithium-Ion
	<b>Docking</b>	HP 2400 Series Docking Station
	<b>Power</b>	65W Smart AC 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>nc2400</b> RM161UT#ABA Smart Buy	<b>Processor</b>	Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache)
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024-MB 533-MHz DDR2 SDRAM
	<b>Hard Drive</b>	60-GB 4200 rpm SMART
	<b>Display</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>Graphics</b>	Intel Graphics Media Accelerator 950, with up to 224-MB of shared system memory
	<b>Audio</b>	ADI High Definition CODEC, Line out/headphone and microphone jacks
	<b>Optical Drive</b>	9.5-mm DVD/CD-RW Combo
	<b>Communications</b>	Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection
	<b>Integrated Security</b>	TPM 1.2 Embedded Standard Security Chip** HP Fingerprint Sensor
	<b>Pointing Device</b>	Pointstick
	<b>Battery</b>	3-cell (28Wh) high capacity Lithium-Ion
	<b>Power</b>	65W Smart AC Adapter
	<b>Warranty</b>	3/3/0

### Standard Features

<b>nc2400</b> RM165UT#ABA Smart Buy	<b>Processor</b>	Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache)
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024-MB 533-MHz DDR2 SDRAM
	<b>Hard Drive</b>	80-GB 4200 rpm SMART
	<b>Display</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>Graphics</b>	Intel Graphics Media Accelerator 950, with up to 224-MB of shared system memory
	<b>Audio</b>	ADI High Definition CODEC, Line out/headphone and microphone jacks
	<b>Optical Drive</b>	9.5-mm DVD +/- RW
	<b>Communications</b>	Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection Bluetooth
	<b>Integrated Security</b>	TPM 1.2 Embedded Standard Security Chip** HP Fingerprint Sensor
	<b>Pointing Device</b>	Pointstick
	<b>Battery</b>	6-cell (55Wh) high capacity Lithium-Ion
	<b>Power</b>	65W Smart AC Adapter
	<b>Warranty</b>	3/3/0

<b>nc2400</b> RM162UT#ABA Smart Buy	<b>Processor</b>	Intel Core Duo Processor U2500* (1.20-GHz, 533-MHz FSB, 2-MB L2 cache)
	<b>Operating System</b>	Genuine Windows XP Professional
	<b>System Memory</b>	1024-MB 533-MHz DDR2 SDRAM
	<b>Hard Drive</b>	80-GB 4200 rpm SMART
	<b>Display</b>	12.1-inch TFT WXGA (1280 x 800 resolution)
	<b>Graphics</b>	Intel Graphics Media Accelerator 950, with up to 224-MB of shared system memory
	<b>Audio</b>	ADI High Definition CODEC, Line out/headphone and microphone jacks
	<b>Optical Drive</b>	9.5-mm DVD +/- RW
	<b>Communications</b>	Broadcom NetLink Gigabit Ethernet PCI Controller (10/100/1000 NIC)
	<b>Integrated Wireless</b>	Intel PRO/Wireless 3945ABG Network Connection Bluetooth
	<b>Integrated Security</b>	TPM 1.2 Embedded Standard Security Chip** HP Fingerprint Sensor
	<b>Pointing Device</b>	Pointstick
	<b>Battery</b>	6-cell (55Wh) high capacity Lithium-Ion
	<b>Docking</b>	HP 2400 Series Docking Station
	<b>Power</b>	65W Smart AC 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.

## Options

<b>Memory</b>	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

\*NOTE: System runs at a maximum of 533-MHz.

<b>MultiBay II Storage</b> (9.5-mm) NOTE: Requires HP External MultiBay II	DVD-ROM MultiBay II Drive	PA849A
	Combo DVD/CD-RW MultiBay II Drive	PA850A
	DVD+/-RW Dual Format MultiBay II Drive	PA851A
	80-GB 5400 rpm MultiBay II Hard Drive	PH357A

<b>Other Storage</b>	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#ABA
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<b>Expansion Solutions</b>	HP 2400 Series Docking Station	EQ773AA#ABA
	HP Monitor Stand	PA507A
	HP Adjustable Notebook Stand	PA508A
	HP External MultiBay II (9.5-mm)	PA509A
	HP 4-port USB 2.0 Hub	DG954A

<b>Power</b>	HP 2-bay Battery Charging Station	DT533A#ABA
	HP 10-bay Battery Charging Station	DT534A#ABA
	Battery Adapter kit #1	EH769AA
	65W Smart AC Adapter	ED494AA#ABA
	90W Smart AC Adapter	ED495AA#ABA
	90W Smart Auto Adapter	ED493AA
	65W Air/Auto/AC Combo Adapter	ED993AA#ABA
	Primary 6-cell Battery Pack	EH767AA
Primary 9-cell Battery Pack	EH768AA	

<b>Carrying Cases</b>	HP Entry Value Case	DL617A
	HP Top Load Nylon	DC915A
	HP Executive Leather case	PA847A
	HP Sport Backpack	DG102A

## Options

Security	HP PCMCIA Smart Card Reader	DC350B
	HP/Kensington Cable Lock	PC766A
<hr/>		
Input/Output Devices	USB/PS2 Keyboard	DC852A#ABA
	USB/PS2 Optical Mouse	DC369A
	HP USB Optical Travel Mouse	F2100A

## Memory

Up to 2048-MB of 533-MHz DDR2 SDRAM  
One DIMM slot  
DIMM sizes supported: 512-MB, 1024- or 2048-MB

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

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

**\*NOTE:** System runs at a maximum of 533-MHz.

Please refer to the [Hardware and Software Guide](#) for installation procedures. Memory slot is user-accessible.

## Storage

### Removable Media Drive Support

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	Quantity Supported	Drive Bay
DVD+/-RW SuperMulti Double Layer Drive	One	Fixed optical drive bay
DVD/CD-RW Combo Drive	One	Fixed optical drive bay

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### Hard Drive Support

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	Quantity Supported	Drive Bay
<b>Primary Hard Drives</b>		
80-GB 4200 rpm SMART Hard Drive	One	Dedicated hard drive bay
60-GB 4200 rpm SMART Hard Drive	One	Dedicated hard drive bay
40-GB 4200 rpm SMART Hard Drive	One	Dedicated hard drive bay

## Technical Specifications

<b>System Unit</b>	<b>Dimensions (HxWxD)</b>	0.976 (at front) x 11.1 x 8.38 in (25 (at front) x 282 x 213 mm)
	<b>Weight</b>	2.8 lbs (1.29 kg)
	<b>NOTE:</b> Height varies depending upon where on the notebook the measurement is made. Weight includes 3-cell battery, 30-GB hard drive, 512-MB memory, 12.1-inch WXGA display, WLAN module, and Bluetooth. Weight varies by configuration and components.	
	<b>Stand-Alone Power Requirements</b>	Normal Operating Voltage 18.5 V Average Operating Power 18.5 W Max Operating Power < 65 W
	<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>	Energy Star Compliant Yes UL Yes UL GS Yes CSA Yes ICES Yes Australia/NZ Compliance Yes CCC Yes Japan Compliance Yes MIC Yes BSMI Yes CE Marking Compliance Yes KONCAR Yes GOST Yes SASO Yes SABS Yes UKRSERTCOMPUTER Yes



### Technical Specifications

<b>HP 65W Smart AC Adapter</b>	<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>	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%
<b>EMI and Safety Certifications</b>	Storage Humidity	10% to 90%	
	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>83Wh Primary 9-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	1.6 x 2.3 x 8.1 in (4.1 x 5.9 x 20.6 cm)	
	<b>Weight</b>	1.07 lb (0.488 kg)	
	<b>Cells/Type</b>	9-cell Lithium-Ion	
	<b>Energy</b>	Voltage	10.8V
		Watt-hour Capacity	83Wh
		Amp-hour Capacity	7.65Ah
	<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>	System in OFF mode or Standby	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

<b>55Wh Primary 6-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	0.8 x 2.3 x 8.1 in (2.1 x 5.9 x 20.6 cm)		
	<b>Weight</b>	0.73 lb (0.332 kg)		
	<b>Cells/Type</b>	6-cell Lithium-Ion		
	<b>Energy</b>	Voltage	10.8V	
		Watt-hour capacity	55Wh	
		Amp-hour capacity	5.1Ah	
	<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>	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 1.5 hours when system is OFF	
		<b>Fuel Gauge</b>	When pressed, LEDs light indicating level of charge remaining on battery	

<b>28Wh Primary 3-Cell Battery</b>	<b>Dimensions (H x W x L)</b>	0.8 x 1.5 x 8.1 in (2.1 x 3.9 x 20.6 cm)		
	<b>Weight</b>	0.39 lb (0.176 kg)		
	<b>Cells/Type</b>	3-cell Lithium-Ion		
	<b>Energy</b>	Voltage	10.8V	
		Watt-hour Capacity	28.8Wh	
		Amp-hour Capacity	2.55Ah	
	<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>	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 1.5 hours when system is OFF	

### Technical Specifications

12.1-Inch Color TFT WXGA Display	Active Area (W x H)	10.3 x 6.4 in (26.1 x 16.3 cm)		
	Diagonal Size	12.1 in (30.7 cm)		
	Surface Treatment	Anti-glare		
	Contrast Ratio	300:1 (typical)		
	Refresh Rate	60 Hz		
	Brightness	200 nit (typical)		
	Pixel Resolution	Pitch	0.204 mm	
		Format	1280 x 800	
		Configuration	RGB Stripe	
	Backlight	CCFL		
	PPI	125		
Viewing Angle	±45° Horizontal, ±25° Vertical (typical)			

### Hard Drives

80-GB 4200 rpm 1.8" PATA	Drive Weight	0.13 lb (59 g)		
	Capacity	80 GB		
	Height	0.31 in (8 mm)		
	Width	2.12 in (54 mm)		
	Interface	ATA-6		
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)	
	Seek Time (typical reads, including settling)	Single Track	3 ms	
		Average	15 ms	
		Maximum	26 ms	
	Rotational Speed	4200 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 4200 rpm 1.8" PATA	Drive Weight	0.13 lb (59 g)	
	Capacity	60 GB	
	Height	0.31 in (8 mm)	
	Width	2.12 in (54 mm)	
	Interface	ATA-6	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	15 ms
		Maximum	26 ms
	Rotational Speed	4200 rpm	
	Logical Blocks	117,210,240	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

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40-GB 4200 rpm 1.8" PATA	Drive Weight	0.13 lb (59 g)	
	Capacity	40 GB	
	Height	0.31 in (8 mm)	
	Width	2.12 in (54 mm)	
	Interface	ATA-6	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	3 ms
		Average	15 ms
		Maximum	26 ms
	Rotational Speed	4200 rpm	
	Logical Blocks	78,126,048	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

## Fixed Optical Drives

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## Technical Specifications

<b>DVD/CD-RW Combo Drive</b>	<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			

<b>DVD+/-RW SuperMulti Drive with Double Layer</b>	<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			

## Technical Specifications

<b>Max Media Capacity (write)</b>	8.5 GB
<b>Transport</b>	Tray Loading

## Audio

<b>Hardware</b>	<b>Implementation</b>	ADI1981HD High Definition CODEC
	<b>Volume Controls</b>	Up/Down scroll and Mute
	<b>Full Duplex</b>	Yes
	<b>Sound Blaster Pro compatible</b>	Yes
	<b>Microphone Jack</b>	Stereo or mono
	<b>Headphone/Line Out Jack</b>	Stereo

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

<b>Internal Speaker</b>	<b>Power Rating</b>	2 Watts
	<b>Impedance</b>	4 Ohms

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

## Communications

## Technical Specifications

<p><b>Integrated Broadcom NetLink Gigabit Ethernet PCI Controller</b> (BCM5788M)</p>	<p><b>Ethernet Features</b></p>	<p>10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)</p> <p>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)</p> <p>1000 Mbit/s operation (1000BASE-T; IEEE 802.3z and 802.3ab; IEEE 802.3 clauses 34-42)</p> <p>Auto-Negotiation (Automatic Speed Selection)</p> <p>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s</p> <p>IEEE 802.1p QoS (Quality of Service) Support</p> <p>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)</p>
	<p><b>Power Management</b></p>	<p>ACPI compliant -- multiple power modes</p> <p>Situation-sensitive features reduce power consumption</p> <p>NIC Battery Saving Mode (enabled by default)</p>
	<p><b>Performance Features</b></p>	<p>TCP/IP/UDP Checksum Offload (configurable)</p>
	<p><b>Manageability</b></p>	<p>Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)</p> <p>PXE 2.1 Remote Boot</p> <p>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))</p> <p>Comprehensive diagnostic and configuration software suite</p>
	<p><b>Interface</b></p>	<p>32-bit PCI, 33-MHz</p>
	<p><b>NIC Device Driver Name</b></p>	<p>Broadcom NetLink Gigabit Ethernet</p>
	<p><b>Drivers Available</b></p>	<p>Microsoft Windows XP</p> <p>Microsoft Windows 2000</p>

<p><b>V.92 56K Data/Fax Modem</b></p>	<p><b>Form Factor</b></p>	<p>MDC 1.5 Daughtercard</p>
	<p><b>Power Management Support</b></p>	<p>APM Revision 1.2, ACPI</p>
	<p><b>Approvals/Certifications</b></p>	<p>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</p>
	<p><b>Data Mode Capabilities</b></p>	<p>V.92 data</p> <p>V.8bis</p> <p>V.80</p> <p>V44, V.42bis, MNP5 (Compression)</p> <p>V.42 (LAPM, MNP2-4) (Error Correction)</p> <p><b>Optional symbol rates:</b></p> <p>2800, 3429</p> <p>Asymmetric Symbol rates</p>

## Technical Specifications

	<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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<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.
	<b>Sub-channels</b>	Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4).
	<b>Media Access Protocol</b>	Multinational support with frequency bands and channels compliant to local regulations.
	<b>Network Architecture</b>	CSMA/CA (Collision Avoidance) with ACK
	<b>Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	<b>Roaming</b>	IEEE 802.11 compliant roaming between access points





## Technical Specifications

<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 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 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)

### Technical Specifications

- Configuration Utility<sup>5</sup>** Choice of Configuration Utility:
- Microsoft Windows XP Wireless Network Connection Manager
  - Broadcom Wireless Configuration Utility (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.

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

### Technical Specifications

<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)
<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 suppliers.</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

### Technical Specifications

<b>Range</b>	Up 33 ft (10 m)
<b>Electrical Interface</b>	USB 2.0 compliant
<b>OS Support</b>	Microsoft Windows Plug and Play compliant Microsoft Windows XP Professional and Home 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	16.4 W	16.3 W	16.6 W
Sleep (Energy Star low power mode)	1.4 W	1.0 W	1.5 W
Off	1.0 W	0.8 W	1.1 W
<b>Heat Dissipation*</b>	<b>115 VAC</b>	<b>230 VAC</b>	<b>100 VAC</b>
Normal Operation	56 BTU/hr	55.6 BTU/hr	56.6 BTU/hr
Sleep	4.8 BTU/hr	3.8 BTU/hr	5.1 BTU/hr
Off	3.4 BTU/hr	2.7 BTU/hr	3.8 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	2.43	17.8
Fixed Disk (random writes)	2.96	22.4

**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
- 3-, 6-, or 9-cell high capacity Lithium-Ion battery

- Real Time Clock battery
- CR2016 (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 85% recycle-able when properly disposed of at end of life.

### Packaging

#### Packaging Materials

- External:
  - Corrugated Paper – 2.41 lb (1,094 g)
- Internal:
  - EPE Foam – 0.11 lb (50.8 g)
  - LDPE Bag – 0.01 lb (5 g)
- The corrugated paper packaging materials contains at least 90% 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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