QuickSpecs

HP Compaq Pro 4300 Small Form Factor Business PC

Overview

1. Rear I/O includes (4) USB 2.0 ports, serial port, PS/2 mouse and keyboard ports, RJ-45 network interface, VGA and DVI-D video interfaces, and audio in/out jacks

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

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

4. HP Optical Mouse

5. HP Keyboard

6. 3.5” external drive bay supporting a media card reader

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

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

9. 240W standard efficiency or 85% high efficiency Power Supply

10. HP Monitor (sold separately)
Overview

At A Glance

- Intel® H61 Express chipset
- Intel 2nd & 3rd generation Core™ processors
- Integrated Intel HD Graphics
- Broadcom BCM 57788 Gigabit Ethernet LAN with Lightning protection
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Integrated dual independent monitor support via a VGA and DVI-D video interface
- Standard efficiency, high voltage protection or 85% high efficiency energy saving power supplies available (offering will vary by geographic region)
- ENERGY STAR® qualified. EPEAT® registered where applicable/supported. See www.epeat.net for registration status by country.
- Created using industry leading Design for Environment standards
- Tailored HP Factory Express deployment and lifecycle services available
- Protected by HP Services, including standard warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)
OPERATING SYSTEMS

Preinstalled

- Windows 8 Pro (64-bit)*
- Windows 8 (64-bit)*
- Windows® 7 Professional (32-bit)**
- Windows® 7 Professional (64-bit)**
- Windows® 7 Professional (32-bit) (available through downgrade rights from Windows 8 Pro)***
- Windows® 7 Professional (64-bit) (available through downgrade rights from Windows 8 Pro)***
- Windows® 7 Home Premium (32-bit)**
- Windows® 7 Home Premium (64-bit)**
- Windows® 7 Home Basic (32-bit)**
- FreeDOS 2.0
- Novell SUSE Linux Enterprise Desktop 11

*Not all features are available in all editions of Windows 8. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8 functionality. See http://www.microsoft.com.

**Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

***This system is preinstalled with Windows® 7 Pro software and also comes with a license and media for Windows 8 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

Certified

- Novell SUSE Linux Enterprise Desktop 11

Supported

- Windows® 7 Enterprise Edition (32-bit or 64-bit)
- Windows 8 Enterprise (32-bit or 64-bit)
- Windows 8 Pro (32-bit)
- Windows 8 (32-bit)
PROCESSOR

**Intel® 3rd Generation Core™ i7 Processors**
Intel® Core™ i7-3770S with Intel HD Graphics 4000 (3.10 GHz, 8 MB cache, 4 cores)
8 threads, 65 W
Intel Stable Image Platform Program (SIPP)

**Intel® 3rd Generation Core™ i5 Processors**
Intel® Core™ i5-3570S with Intel HD Graphics 2500 (3.10 GHz, 6 MB cache, 4 cores)
4 threads, 65 W
Intel Stable Image Platform Program (SIPP)
Intel® Core™ i5-3475S with Intel HD Graphics 4000 (2.90 GHz, 6 MB cache, 4 cores)
4 threads, 65 W
Intel Stable Image Platform Program (SIPP)
Intel® Core™ i5-3470S with Intel HD Graphics 2500 (2.90 GHz, 6 MB cache, 4 cores)
4 threads, 65 W
Intel Stable Image Platform Program (SIPP)

**Intel® 2nd Generation Core™ i3 Processors**
Intel® Core™ i3-2130 with Intel HD Graphics 2000 (3.40 GHz, 3 MB cache, 2 cores)
4 threads, 65W
Intel® Core™ i3-2120 with Intel HD Graphics 2000 (3.30 GHz, 3 MB cache, 2 cores)
4 threads, 65W

**Intel® Pentium® Processors**
Intel® Pentium® G870 with Intel HD Graphics (3.10 GHz, 3 MB cache, 2 cores)
2 threads, 65 W
Intel® Pentium® G860 with Intel HD Graphics (3.00 GHz, 3 MB cache, 2 cores)
2 threads, 65 W
Intel® Pentium® G640 with Intel HD Graphics (2.80 GHz, 3 MB cache, 2 cores)
2 threads, 65 W

**Intel® Celeron® Processors**
Intel® Celeron® G550 with Intel HD Graphics (2.60 GHz, 2 MB cache, 2 cores)
2 threads, 65 W
Intel® Celeron® G540 with Intel HD Graphics (2.50 GHz, 2 MB cache, 2 cores)
2 threads, 65 W
Intel® Celeron® G460 with Intel HD Graphics (1.80 GHz, 1.5 Mb cache, 1 core)
2 threads, 65 W

CHIPSET

Intel® H61 Express
QuickSpecs

SMBIOS

System Management BIOS, previously known as DMI BIOS, is used to store system management information.

GRAPHICS

Integrated on all models (depends on processor)

Intel HD Graphics: Basic, 2000, 2500, 4000

NOTE: Models with Intel Core i3/i5/i7 processors include HD 2000, 2500 or 4000 graphics. Models with Pentium or Celeron processors include HD graphics. Please see specific processors for graphics configuration.

Discrete

AMD Radeon HD 6350 (512 MB) PCIe x16
AMD Radeon HD 7450 (1 GB) PCIe x16
NVIDIA NVS 300 (512 MB) PCIe x16
NVIDIA NVS 310 (512 MB) PCIe x16

Adapters and Cables

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

STORAGE

SATA Hard Drive

250 GB, 7200 rpm, SATA 6.0 Gb/s, SMART IV
500 GB, 7200 rpm, SATA 6.0 Gb/s, SMART IV
1 TB, 7200 rpm, SATA 6.0 Gb/s, SMART IV

SATA Solid State Drive

120 GB, SATA, Solid State Drive
128 GB, SATA, Solid State Drive

Optical Disc Drive

HP SATA DVD-ROM
HP SATA SuperMulti DVD Writer
HP SATA Blu-ray Writer
No included ODD

Media Card Reader

HP 22-in-1 (optional)
MEMORY

Type
Non-ECC, DDR3 SDRAM, 1600 MHz, DIMM (runs at 1333 MHz due to chipset)

Maximum
16 GB

# of Slots
2

NOTE: Full availability of 4 GB or more of memory requires a 64-bit operating system. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

NETWORKING/COMMUNICATIONS

Ethernet (RJ-45)
Integrated Broadcom BCM 57788 Gigabit Ethernet LAN with Lightning protection
Intel Pro 1000 CT2 Gigabit Ethernet Network Card (optional)

NOTE: 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.

Wireless
HP 802.11 b/g/n Wireless Network Card PCIe x1 (optional)

AUDIO/MULTIMEDIA

High Definition Audio with Realtek ALC221 codec (all ports are stereo)
Microphone/Headphone front ports (standard)
Line-out and Line-In rear ports (standard)
Multi-streaming capable (standard)
Internal Speaker (standard)
HP Thin USB Powered Speakers (optional)

NOTE: The audio ports/jacks provided by all HP desktop systems are 3.5mm in diameter. This would include both the front jacks and rear jacks, for audio in/out, mic in and headphone out.
KEYBOARDS AND POINTING DEVICES

Keyboard
- HP USB Standard
- HP PS/2 Standard
- HP USB CCID SmartCard Keyboard
- HP USB PS/2 Washable Keyboard
- HP Wireless Keyboard and Mouse
- HP Wireless Keyboard & Dongle (Brazil)

Mice
- HP USB Optical Mouse
- HP PS/2 Optical Mouse
- HP USB Laser Mouse
- HP USB PS/2 Washable Scroll Mouse
- HP Wireless Laser Mouse (Brazil)

STAND
- HP Small Form Factor tower stand

SECURITY

SATA Port Disablement (via BIOS)
Drive Lock
Serial, Parallel, USB enable/disable (via BIOS)
Optional USB Port Disable at factory (user configurable via BIOS)
Removable Media Write/Boot Control
Power-On Password (via BIOS)
Setup Password (via BIOS)
HP Chassis Security Kit
Support for chassis padlocks and cable lock devices
Face Recognition for HP ProtectTools

POWER

240W, 85% efficient, active PFC
240W, standard efficiency, active PFC

SOFTWARE

Included
Security
Windows 8
- HP Client Security
Windows 7
- HP Client Security

- Credential Manager
- Password Manager
- One Step Logon
- Face Recognition (with optional webcam)
- SpareKey
- Credential Manager
- Password Manager
- One Step Logon
- Face Recognition (with optional webcam)
- SpareKey
Standard Features and Configurable Components (availability may vary by country)

- Device Access Manager w/ JITA
- Drive Encryption*
- Computrace (user optional)**
- Windows Defender
- DigitalPass
- Device Access Manager w/ JITA
- Drive Encryption (McAfee)
- File Sanitizer
- Privacy Manager
- Computrace (user optional)**
- Microsoft Security Essentials
- Bing (Search)

** Windows Applications **

<table>
<thead>
<tr>
<th>Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer</td>
</tr>
<tr>
<td>Store</td>
</tr>
<tr>
<td>Desktop</td>
</tr>
<tr>
<td>Photos</td>
</tr>
<tr>
<td>Mail</td>
</tr>
<tr>
<td>Games</td>
</tr>
<tr>
<td>Calendar</td>
</tr>
<tr>
<td>People (contacts)</td>
</tr>
<tr>
<td>Messaging</td>
</tr>
<tr>
<td>SkyDrive</td>
</tr>
<tr>
<td>Music</td>
</tr>
<tr>
<td>Video</td>
</tr>
<tr>
<td>Camera</td>
</tr>
<tr>
<td>News</td>
</tr>
<tr>
<td>Sports</td>
</tr>
<tr>
<td>Weather</td>
</tr>
<tr>
<td>Maps</td>
</tr>
<tr>
<td>Finance</td>
</tr>
<tr>
<td>Bing (Search)</td>
</tr>
</tbody>
</table>

** Productivity **

- Buy Office

** HP Additions **

- HP Registration
- HP Getting Started with Windows 8
- HP ePrint***
- HP Support Assistant
- CyberLink Media Suite Windows 8
- CyberLink Media Suite
- CyberLink YouCam****
- CyberLink YouCam Windows 8****
- CyberLink Webcam Sharing Manager****
- CyberLink PowerDVD SD, BD
- CyberLink Power2Go
- CyberLink Photo Director
- CyberLink Power Director
- HP Mobile Connect
- Evernote
- Skype

** Desktop Applications **

- HP Wireless Hotspot
- HP Support Assistant
- PDF Complete, corporate edition

** Productivity **

- Buy Office
- Corel WinDVD 10.0 SD (DVD) Player*****
- Corel WinDVD 10.0 BD (Blu-Ray) Player*****
- Roxio MyDVD Business 2010*****
- Roxio MyDVD Business 2010 HD*****
- HP Marketplace
- HP Wallpaper

** Desktop Applications **

- PDF Complete Corporate Edition
- WinZip Basic
- Adobe Flash Player
Standard Features and Configurable Components (availability may vary by country)

<table>
<thead>
<tr>
<th>HP Documentation (eDOCS)</th>
<th>HP eHelp Documentation</th>
<th>HP eHelp Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Hardware Reference Guide</td>
<td>HP Hardware Reference Guide</td>
<td></td>
</tr>
<tr>
<td>HP Quick Setup &amp; Getting Started Guide</td>
<td>HP Quick Setup &amp; Getting Started Guide</td>
<td></td>
</tr>
<tr>
<td>HP Regulatory and Safety Information</td>
<td>HP Regulatory and Safety Information</td>
<td></td>
</tr>
<tr>
<td>HP Safety and Comfort Guide</td>
<td>HP Safety and Comfort Guide</td>
<td></td>
</tr>
<tr>
<td>HP Warranty Documentation</td>
<td>HP Warranty Documentation</td>
<td></td>
</tr>
<tr>
<td>HP Support Applications</td>
<td>HP EUDI Support Environment</td>
<td></td>
</tr>
<tr>
<td>HP Help and Support</td>
<td>HP Help and Support</td>
<td></td>
</tr>
<tr>
<td>HP Setup v9.0</td>
<td>HP Recovery Manager</td>
<td></td>
</tr>
<tr>
<td>HP Support Assistant</td>
<td>HP Setup v9.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HP Support Assistant</td>
<td></td>
</tr>
</tbody>
</table>

*Available via download

** Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription. Subscriptions can be purchased for terms ranging from one to five years. Service is limited, check with Absolute for availability outside the U.S.

*** Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter). Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.

****Preinstalled on models with webcam

*****Optional

ENVIRONMENTAL & REGULATORY

Energy Star® qualified models available

EPEAT® registered where applicable/supported. See www.epeat.net for registration status by country.

TAA compliant

For accessibility information on HP products, please visit: http://www.hp.com/accessibility

ENVIRONMENTAL

** Weight

- System weight
  - 16.72 lb
  - 7.6 kg
- Shipping weight
  - 17.86 lb
  - 8.1 kg
- Maximum supported weight
  - 77 lb
  - 35 kg

** Volume

790.26 cu in (12.95 L)

** Dimensions (W x D x H)

Without stand
- 13.3 x 14.9 x 3.95 in
- 33.8 x 37.85 x 10 cm

Tower stand
- 7.01 x 7.87 x 1.12in
- 178 x 20 x 2.85 cm

Shipping carton
- 19.68 x 23.38 x 9 in
TEMPERATURE, HUMIDITY, ALTITUDE

<table>
<thead>
<tr>
<th></th>
<th>Operating</th>
<th>Non-operating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td>50 to 95°F*</td>
<td>-22 to 140°F</td>
</tr>
<tr>
<td></td>
<td>10 to 35°C*</td>
<td>-30 to 60°C</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>10 to 90% (non-condensing at ambient)</td>
<td>5 to 95% (non-condensing at ambient)</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td>0 to 10000 ft (0 to 3048 m)</td>
<td>0 to 30,000 ft (0 to 9144 m)</td>
</tr>
</tbody>
</table>

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

PORTS

I/O Ports – Standard

10 – USB 2.0 (4 front, 4 rear, 2 internal)
1 – Microphone in (front)
1 – Headphone jack (front)
1 – Serial RS-232 (rear)
1 – Audio line in (rear)
1 – Audio line out (rear)
2 – PS/2 (rear)
Color coded support for keyboard (purple) and mouse (green)
1 – RJ-45 (rear)
Accesses the integrated Broadcom network interface controller
1 – VGA (rear)
1 – DVI-D (rear)
Provides integrated dual independent monitor support

I/O Ports – Optional

1 – 22-in-1 media card reader
1 – Serial (via optional adapter)
1 – Parallel (via optional adapter)
QuickSpecs

HP Compaq Pro 4300 Small Form Factor Business PC

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

SLOTS

1 – PCIe x16
Low-profile – 2.5”
Length 6.6”
25 W maximum power
1 PCIe x1
Low-profile – 2.5”
Length 6.6”
10 W maximum power
2 PCI
Low-profile – 2.5”
Length 6.6”
25 W maximum power

BAYS

1 – 3.5” external
Available for optional Media Card Reader
1 – 5.25” external
8.19” depth for optional optical disc drive
1 – HDD internal
Available for 3.5” hard disk drive

SERVICE AND SUPPORT

On-site warranty and service¹: This limited warranty and service offering delivers parts, labor and on-site repair for terms up to 3 years. Optional terms available up to 5 years. Response time is next business day² and includes free telephone support³ 24 x 7. Global coverage² ensures any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor. For extended service for your HP product, visit HP Care Pack Central: www.hp.com/go/cpc.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical telephone support applies only to HP-configured, Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.
Intel HD Graphics

VGA Controller: Integrated
DVI-D: Integrated
Bus Type: Intel® Flexible Display Interface (Intel® FDI) - a proprietary link for carrying display traffic from the Processor Graphics controller to the PCH display I/Os

Memory: Intel graphics do not have dedicated memory but utilizes some of the computer's system memory. The amount of memory used for graphics depends on the amount of system memory installed, BIOS settings, operating system, and system load. 32 MB is pre-allocated for graphics use at system boot time. Additional memory can be allocated at boot time by the BIOS for PAVP (Protected Audio Video Playback) support for playback of protected video content.

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

Maximum Graphics Memory:
- Microsoft Windows XP: Up to 1GB
- Microsoft Windows 7: Up to 1.7GB
- Windows 8: Up to 1.8GB

Note: the actual amount of maximum graphics memory can be less than the amounts listed above depending upon your computer's configuration.

Multi-display Support: Integrated dual independent monitor support facilitated via one VGA port and one DVI-D integrated on the back plane of the system board and presented as part of the rear I/O set of interfaces. Support for DVI, HDMI, dual link DVI or second VGA monitor provided by optional HP DisplayPort adapters (see complete listing of available optional adapters elsewhere in this QuickSpec).

The system can support greater than two monitors with the addition of an optional discrete graphics card. Both integrated graphics and discrete graphics can be utilized simultaneously.

HW Video Decode: AVC/VC1/MPEG2/JPEG/MJPEG/PAVP
Maximum Color Depth: 32 bits/pixel
Graphics/Video API Support:

3rd Generation Core processors:
- The Processor Graphics contains a refresh of the seventh generation graphics core enabling substantial gains in performance and lower power consumption. Up to 16 EU support.
- Next Generation Intel Clear Video Technology HD Support is a collection of video playback and enhancement features that improve the end user's viewing experience
  - Encode/transcode HD content
  - Playback of high definition content including Blu-ray Disc
  - Superior image quality with sharper, more colorful images
  - Playback of Blu-ray disc S3D content using HDMI (V.1.4 with 3D)
- DirectX Video Acceleration (DXVA) support for accelerating video processing
  - Full AVC/VC1/MPEG2 HW Decode
- Advanced Scheduler 2.0, 1.0, XPDM support
- Windows 7, Windows XP, OSX, Linux OS Support
- DirectX 11, DirectX 10.1, DirectX 10, DirectX 9 support
- OpenGL 3.3 support

2nd Generation Core processors:
- The Processor Graphics contains a refresh of the sixth generation graphics core enabling substantial gains in performance and lower power consumption.
Next Generation Intel Clear Video Technology HD support is a collection of video playback and enhancement features that improve the end user’s viewing experience.

- Encode/transcode HD content
- Playback of high definition content including Blu-ray Disc
- Superior image quality with sharper, more colorful images
- Playback of Blu-ray disc S3D content using HDMI (V.1.4 with 3D)

- DirectX Video Acceleration (DXVA) support for accelerating video processing
  - Full AVC/VC1/MPEG2 HW Decode

- Advanced Scheduler 2.0, 1.0, XPDM support
- Windows 7, XP, Windows Vista, OSX, Linux OS Support
- DirectX 10.1, DirectX 10, DirectX 9 support
- OpenGL 3.0 support

**Supported Display Resolutions and Refresh Rates**

*NOTE:* other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Analog</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>640x480</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>800x600</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1024x768</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1280x720</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1280x1024</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1440x900</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>1600x1200</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1680x1050</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>1920x1080</td>
<td>85</td>
<td>60-R</td>
</tr>
<tr>
<td>1920x1200</td>
<td>85</td>
<td>60-R</td>
</tr>
<tr>
<td>1920x1440</td>
<td>85</td>
<td>N/A</td>
</tr>
<tr>
<td>2048x1536</td>
<td>75</td>
<td>N/A</td>
</tr>
<tr>
<td>2560x1600</td>
<td>N/A</td>
<td>60*</td>
</tr>
</tbody>
</table>

*Note:* Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

*Note:* 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.
AMD Radeon HD 6350 Graphics Card

Factory Default Output Connector
DMS-59 to dual VGA Y Cable

Input/Output Connectors
DMS-59
S-

Board Display Options
Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A.

Board Configuration

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphics Chip</td>
<td>AMD Radeon™ HD 6350 GPU</td>
</tr>
<tr>
<td>Core clock</td>
<td>650 MHz</td>
</tr>
<tr>
<td>Memory clock</td>
<td>800 MHz</td>
</tr>
<tr>
<td>Frame buffer</td>
<td>512 MB DDR3, 64 bit wide</td>
</tr>
</tbody>
</table>

Bus Type
PCI Express x16 Generation 2.0

Max. Vertical Refresh
85Hz

Display Support
Integrated 400MHz RAMDAC

RAMDAC
400MHz DAC, 10-bit per channel

Display Max. Resolution
Digital 1920 x 1200
Analog 2048 x 1536

Display Resolutions and Refresh Rates

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Analog</th>
<th>Maximum Refresh Rate (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 480</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>800 x 600</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1024 x 768</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1280 x 720</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1280 x 1024</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1440 x 900</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>1600 x 1200</td>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>1680 x 1050</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>1920 x 1080</td>
<td>85</td>
<td>60-R</td>
</tr>
<tr>
<td>1920 x 1200</td>
<td>85</td>
<td>60-R</td>
</tr>
<tr>
<td>1920 x 1440</td>
<td>85</td>
<td>N/A</td>
</tr>
<tr>
<td>2048 x 1536</td>
<td>75</td>
<td>N/A</td>
</tr>
<tr>
<td>2560 x 1600</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Only supported with a Display Port monitor connection
** Only supported when using a dual link DVI or DP monitor connection.

Note: 60-R denotes reduced blanking timings are used on single link DVI connections and may be sued with other digital connections.
## Languages supported

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


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

## Operating systems support

Windows 7 Business disk may be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order at least 25 customer systems with the same custom image

† Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: [http://www.windowsvista.com/upgradeadvisor](http://www.windowsvista.com/upgradeadvisor). For Windows Vista system requirements, visit: [http://www.windowsvista.com/systemrequirements](http://www.windowsvista.com/systemrequirements).

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

## Maximum Power Consumption

19.9 W

- AMD Radeon HD 6350 (512MB) DH PCIe x16 Card with full height bracket attached
- DMS 59 to dual VGA Y cable
- Software CD with graphics drivers
- Low profile bracket to convert the card for using in a low profile chassis
- Warranty documentation

## Option kit contents

- AMD Radeon HD 7450 DF Graphics Card
- Factory Default Output Connector: DisplayPort, Dual-link DVI-I with DVI to VGA Adaptor
- Input/Output Connectors: One Dual link DVI-I and one DisplayPort output.

### AMD Radeon HD 7450 DF Graphics Card

#### Specification

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphics Chip</td>
<td>AMD Radeon™ HD 7450 GPU</td>
</tr>
<tr>
<td>(Based on AMD Radeon™ HD 6000 series GPU technology)</td>
<td></td>
</tr>
<tr>
<td>Core clock</td>
<td>625 MHz</td>
</tr>
<tr>
<td>Core clock</td>
<td>800 MHz</td>
</tr>
<tr>
<td>Frame buffer</td>
<td>1GB MB DDR3, 64 bit wide</td>
</tr>
<tr>
<td>Bus Type</td>
<td>PCI Express x16 Generation 2.0</td>
</tr>
<tr>
<td>Max. Vertical Refresh</td>
<td>85Hz</td>
</tr>
<tr>
<td>Display Support</td>
<td>Integrated 400MHz RAMDAC</td>
</tr>
</tbody>
</table>
RAMDAC
400MHz DAC, 10-bit per channel

Display Max. Resolution
Digital 1920 x 1200
Analog 2048 x 1536

Display Resolutions and Refresh Rates

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Analog</th>
<th>Maximum Refresh Rate (Hz)</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 480</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>800 x 600</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1024 x 768</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1280 x 720</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1280 x 1024</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1440 x 900</td>
<td>75</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1600 x 1200</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1680 x 1050</td>
<td>75</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1920 x 1080</td>
<td>85</td>
<td>60-R</td>
<td></td>
</tr>
<tr>
<td>1920 x 1200</td>
<td>85</td>
<td>60-R</td>
<td></td>
</tr>
<tr>
<td>1920 x 1440</td>
<td>85</td>
<td>60*</td>
<td></td>
</tr>
<tr>
<td>2048 x 1536</td>
<td>75</td>
<td>60*</td>
<td></td>
</tr>
<tr>
<td>2560 x 1600</td>
<td>N/A</td>
<td>60**</td>
<td></td>
</tr>
</tbody>
</table>

* Only supported with a Display Port monitor connection
** Only supported when using a dual link DVI or DP monitor connection.

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

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


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

Operating systems support
Windows 7 Business disk may be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order at least 25 customer systems with the same custom image

† Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements. Linux x86 and x86_64 distributions using XFree86 or X.Org†.
Linux drivers are available from ATI’s website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information.

- AMD Radeon HD 7450 DP (1GB) PCIe x16 Card with full height bracket attached
- DVI to VGA adapter
- Software CD with graphics drivers
- Low profile bracket to convert the card for using in a low profile chassis
- Warranty documentation

**Option kit contents**

**Compliance standards**

- **EMC Emissions:**
  a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use
  c) Canadian Standard ICES-003 is equivalent to CISPR22
  d) Taiwanese Standard BSMI
  e) Japanese VCCI
  f) Australian C-Tick
  g) Korean (KCC)

**EMC Immunity:**


**RAMDAC**

- 400MHz DAC, 10-bit per channel

**Display Max. Resolution**

- Digital 1920 x 1200
- Analog 2048 x 1536

**NVIDIA NVS 300 Graphics Card**

**Introduction**

The NVIDIA NVS 300 PCIe Graphics Card is a low profile, dual-head graphics card delivering next-generation multi-display capabilities to professional business and commercial applications.

If you require a graphics card for use with desktops in a telesales-center environment, or frequently analyze spreadsheets requiring the flexibility of dual-monitor displays, the NVIDIA NVS 300 PCIe Graphics Card is the ideal solution for you. Easily installed with a setup wizard, this controller integrates seamlessly with the Microsoft Windows environment. nView – NVIDIA’s multi-display software, enhances your productivity in single or multi-display environments by allowing you to take advantage of features like gridlines & Virtual Desktops (Virtual Desktops allows an end user to create up to 32 individual desktops)

The NVIDIA NVS 300 PCIe Graphics Card is also GPU computing ready. It is capable of enhancing system performance if used in conjunction with applications that support GPU computing through DirectCompute, CUDA, or OpenCL frameworks.

The NVIDIA NVS 300 PCIe Graphics Card includes 512MB of DDR3 graphics memory. A minimum system memory configuration of 1GB is needed to support this card.

**NOTE:** Graphics cards use part of the total system memory (RAM) for graphics performance. System memory dedicated to graphics performance is not available for other use by other programs.

**Key Benefits**

- View your work on two monitors with nView multi-display software and create up to 32 individual desktops (using 'Virtual Desktops' with nView)
Technical Specifications - Graphics

- Compatible with all major financial, non-linear editing (NLE), and electronic design automation (EDA) applications
- Includes 512 MB of dedicated DDR3 graphics memory
- Deliver crystal-clear images via dual 400-MHz RAMDACs
- Supports the latest flat-panel displays, dual analog or digital displays
- Robust IT management tools for seamless installation, deployment and maintenance
- Passive heatsink for silent operation
- DirectX 10.1 support in hardware for optimal performance in DX10 applications
- OpenGL 3.3 support in hardware for optimal performance with OpenGL applications

Factory Default Output: DMS-59 to dual VGA Y Cable

Connector: PCI Express x16 (generation 2.0)

Form Factor: Low Profile, half length, 2.586” x 5.7” (6.57 x 14.48 cm)
Full height bracket utilized when configured to MT

Graphics Controller: Nvidia GT218 GPU

Memory Frame Buffer: 512MB DDR3, 64-bit wide
Single DMS-59 connector

Output Connectors: Supports dual analog displays with included DMS-59 to dual VGA Y cable.
Support dual digital displays with an optional adapter (see complete listing of available optional adapters elsewhere in this QuickSpec).

RAMDAC: Dual 400MHz

Core Clock: 520MHz

Memory Clock: 790MHz

Frame Buffer: 512MB DDR2, 64-bit wide

Maximum Pixel Clock (analog): 400MHz

Overlay planes: One 16-bit video overly plane

Video Acceleration: DirectX 10.1; OpenGL 3.3; CUDA, DirectCompute
Full screen, full frame video playback of HDTV, Blu-ray and DVD content

High-definition Video Processor (HDVP): Inbuilt video decoder for multiple video formats including MPEG2, VC-1, WMV9, H.264, and MVC
Capable of decoding dual Video Streams at HD (1080p) resolutions
Hardware color-space conversion (YUV 4:2:2 and 4:2:0)
High-Quality in-built Filtering/Scaling
Stereo & HD Audio (LPCM 7.1) support for HDMI outputs (HDMI via optional DVI-HDMI dongles) with the DMS-59 to DisplayPort Adapter

Supported Graphics APIs: OpenGL 3.3 support in hardware
DirectX 10.0 support in hardware

Display Resolutions and Refresh Rates

Note: other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Analog</th>
<th>Maximum Refresh Rate (Hz)</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 480</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>800 x 600</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1024 x 768</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1280 x 720</td>
<td>85</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>
NVIDIA NVS 310 Graphics Card

Introduction

The NVIDIA® NVS™ 310 Graphics Card is a PCI Express low profile form factor graphics add-in card targeted as an active low cost graphics solution for the corporate business and enterprise markets.

The NVIDIA® NVS 310 graphics card is an ideal solution for customers requiring a small form factor graphics add-in card for either standard or small form factor PC designs.

Performance and Features

The NVIDIA® NVS 310 Graphics Card offers 512 MB of ultrafast DDR3 memory and is capable of supporting up to 2 displays.

- DisplayPort connector supports multimode technology to support connection to DVI-D, VGA and HDMI monitors with optional adapters in kits NR078AA, FH973AT, BP937AA, AS615AA.
- For a DisplayPort to DisplayPort connections use the optional DisplayPort Cable Kit VN567AA.

QuickSpecs

<table>
<thead>
<tr>
<th>Display Mode</th>
<th>Memory Clock</th>
<th>Memory Bandwidth</th>
<th>Maximum Resolution</th>
<th>Display Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1280 x 1024</td>
<td>85</td>
<td>14 GB/s</td>
<td>Up to 2560 x 1600</td>
<td>Drives two DisplayPort enabled digital display at resolutions up to 2560 x 1600 at 60 Hz with reduced blanking, when connected natively using the 2 DisplayPort connectors on the NVS 310 graphics card</td>
</tr>
<tr>
<td>1440 x 900</td>
<td>75</td>
<td></td>
<td></td>
<td>Supports 2 monitors up to resolution of 1920 x 1200 at 60 Hz with reduced blanking using DisplayPort 1.2 multi stream topology technology.</td>
</tr>
<tr>
<td>1600 x 1200</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1680 x 1050</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1920 x 1080</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1920 x 1200</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1920 x 1440</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2048 x 1536</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Drives two digital display at resolutions up to 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort to DVI-D single-link cable adaptors
- Drives two digital display at resolutions up to 2560× 1600 at 60 Hz with reduced blanking using DisplayPort to DVI-D dual-link cable adaptors

HDMI output:

- NVS 310 is capable of driving two high definition (HD) panels up to resolutions of 1920 × 1080P at 60 Hz using DisplayPort to HDMI cable adaptors

VGA display output:

- Drives two analog display at resolutions up to 1920 × 1200 at 60 Hz using DisplayPort to VGA cable adaptors

Max. Power 19.5 W

Display Resolutions and Refresh Rates

*Note:* other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

<table>
<thead>
<tr>
<th>Resolution</th>
<th>DisplayPort to VGA</th>
<th>DisplayPort to DVI-D</th>
<th>DisplayPort to HDMI</th>
<th>DisplayPort</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 480</td>
<td>85</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>800 x 600</td>
<td>85</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1024 x 768</td>
<td>85</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1280 x 720</td>
<td>85</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1280 x 1024</td>
<td>85</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1440 x 900</td>
<td>75</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1600 x 1200</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1680 x 1050</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1920 x 1080</td>
<td>60-R</td>
<td>60-R</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1920 x 1200</td>
<td>60-R</td>
<td>60-R</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1920 x 1440</td>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>2048 x 1536</td>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>2560 x 1600</td>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

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

HP Serial Advanced Technology Attachment (SATA) Hard Drives maximize the performance of HP Business PCs by providing the technologies to meet your increasing storage demands with high-capacity drives offering superior reliability and performance.

SATA provides faster data transfer speeds, better system cooling airflow, more bandwidth, more headroom for speed increases in future generations and better data integrity. A next-generation technology, the SATA interface connects hard drives to the PC platform enabling easy aggregation of multiple hard drives into a single PC. This offers you the additional benefits of dedicated bandwidth, the ability to more easily identify device failures and scalability. The HP Compaq Pro 4300 Series supports the latest SATA 6.0 Gb/s specification.

HP Drive Lock

HP Serial ATA Hard Drives offer enhanced security via a new Drive Lock. When enabled, this ATA security feature set prevents software access to user data on the drive until one or two user-defined passwords are provided.

SMART IV Technology

Self Monitoring Analysis and Reporting Technology (SMART) hard drive technology allows hard drives to monitor their own health and to raise flags if imminent failures are predicted. If the drive determines that a failure is imminent, the SMART hard drive technology enables the intelligent manageability or management software to generate a fault alert. While the current versions of SMART hard drives do a good job monitoring the data on the hard drive media, the ever increasing emphasis on reliability and quality has promoted HP to implement SMART IV technology which constantly checks that the data flow from host interface to media and media to host interface is not compromised. This is accomplished by inserting a 2 byte parity code into every 512 byte block in the data path of the hard drive's Cache RAM. This unique parity checking performed by HP's SMART IV technology hard drives, allows for more complete error detection coverage encompassing the entire data path between the host and the hard drive.

Smart IV is also known as IOEDC: I/O Error Detection Code.

Native Command Queuing

NCQ or Native Command Queuing is a SATA protocol extension that allows the hard drive to have several write or read commands outstanding at the same time. In contrast, normal non-queued operation requires each command to be completed before the next command is issued by the host system. Queuing allows the drive to complete the commands in the order that allows for best overall throughput. It also involves an advanced method of transferring data to or from the host, called First Party Direct Memory Access (FPDMA), which allows the hard drive and the host controller to manage the data transfers for multiple outstanding commands, without involving the host processor. NCQ can contribute to better performance but the results are dependent on many factors, including the access patterns of the various applications and operating system functions that are initiating drive accesses. Enabling NCQ features in the hard drive requires AHCI support from the host system BIOS, controller, and driver. AHCI support is typically implemented in RAID configurations.

Note: GB = 1 billion bytes. Actual available capacity is less.
Technical Specifications – Hard Disk and Solid State Storage

<table>
<thead>
<tr>
<th>Storage Drive Support</th>
<th>Media Card Reader</th>
<th>Media Card Reader</th>
<th>Hard Disk Drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity Supported</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Position</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Controller**

- **Hard Drive Controller**: Serial ATA (SATA) 3.0
  - Supports up to 6.0 Gb/s

- **SATA Interfaces**: 2 total

- **Host SATA Controller**: Advanced Host Controller Interface (AHCI) Revision 1.2. The specification includes a description of the hardware/software interface between system software and the host controller hardware.
### HP 250-GB 7200rpm SATA 6.0Gb/s 3.5” Hard Disk Drive

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>250,059,350,016 bytes</td>
</tr>
<tr>
<td>Rotational Speed</td>
<td>7,200 rpm</td>
</tr>
<tr>
<td>Interface</td>
<td>Serial ATA 3.0 (6.0 Gb/s)</td>
</tr>
<tr>
<td>Buffer Size</td>
<td>8 MB</td>
</tr>
<tr>
<td>Logical Blocks</td>
<td>488,397,168</td>
</tr>
<tr>
<td>Seek Time (typical reads, includes controller overhead, including settling)</td>
<td></td>
</tr>
<tr>
<td>Single Track</td>
<td>1.0 ms</td>
</tr>
<tr>
<td>Average</td>
<td>8.5 ms</td>
</tr>
<tr>
<td>Full-Stroke</td>
<td>18 ms</td>
</tr>
<tr>
<td>Height (nominal)</td>
<td>1 in (2.54 cm)</td>
</tr>
<tr>
<td>Width (nominal)</td>
<td>Media diameter: 3.5 in (8.89 cm)</td>
</tr>
<tr>
<td></td>
<td>Physical size: 4 in (10.2 cm)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>41° to 131° F (5° to 55° C)</td>
</tr>
</tbody>
</table>

### HP 500-GB 7.2K rpm SATA 6.0Gb/s 3.5” Hard Disk Drive

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>500,107,862,016 bytes</td>
</tr>
<tr>
<td>Rotational Speed</td>
<td>7,200 rpm</td>
</tr>
<tr>
<td>Interface</td>
<td>Serial ATA 3.0 (6.0 Gb/s)</td>
</tr>
<tr>
<td>Buffer Size</td>
<td>16 MB</td>
</tr>
<tr>
<td>Logical Blocks</td>
<td>976,773,168</td>
</tr>
<tr>
<td>Seek Time (typical reads, includes controller overhead, including settling)</td>
<td></td>
</tr>
<tr>
<td>Single Track</td>
<td>2.0 ms</td>
</tr>
<tr>
<td>Average</td>
<td>11 ms</td>
</tr>
<tr>
<td>Full-Stroke</td>
<td>21 ms</td>
</tr>
<tr>
<td>Height (nominal)</td>
<td>1 in/2.54 cm</td>
</tr>
<tr>
<td>Width (nominal)</td>
<td>Media diameter: 3.5 in/8.89 cm</td>
</tr>
<tr>
<td></td>
<td>Physical size: 4 in/10.2 cm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>41° to 131° F (5° to 55° C)</td>
</tr>
</tbody>
</table>
### HP 1-TB 7.2K rpm SATA 6.0Gb/s 3.5” Hard Disk Drive

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>1,000,204,886,016 bytes</td>
</tr>
<tr>
<td><strong>Rotational Speed</strong></td>
<td>7,200 rpm</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Serial ATA 3.0 (6.0 Gb/s)</td>
</tr>
<tr>
<td><strong>Buffer Size</strong></td>
<td>32 MB</td>
</tr>
<tr>
<td><strong>Logical Blocks</strong></td>
<td>1,953,525,168</td>
</tr>
</tbody>
</table>

**Seek Time** (typical reads, includes controller overhead, including settling):
- **Single Track**: 2.0 ms
- **Average**: 11 ms
- **Full-Stroke**: 21 ms

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong> (nominal)</td>
<td>1 in/2.54 cm</td>
</tr>
<tr>
<td><strong>Width</strong> (nominal)</td>
<td>Media diameter: 3.5 in/8.89 cm</td>
</tr>
<tr>
<td></td>
<td>Physical size: 4 in/10.2 cm</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>41° to 131° F (5° to 55° C)</td>
</tr>
</tbody>
</table>

### HP 120-GB Solid State Drive

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unformatted Capacity</strong></td>
<td>120 GB</td>
</tr>
<tr>
<td><strong>Architecture</strong></td>
<td>Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Serial ATA 2.0 (3.0 Gb/s)</td>
</tr>
<tr>
<td><strong>Dimensions (W x H x D)</strong></td>
<td>2.74 x 0.37 x 4 in/6.98 x 0.95 x 10.2 cm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0.18 lb/80 g</td>
</tr>
</tbody>
</table>

**Bandwidth Performance**
- **Sustained Sequential Read**: Up to 250 MB/s
- **Sustained Sequential Write**: Up to 70 MB/s
- **Random Read**: Up to 35K IOPs
- **Random Write**: Up to 6.6K IOPs

**Latency**
- **Read**: 65-ms
- **Write**: 85-ms

**Power**
- **DC power requirement**: 5 VDC 5%-100 mV ripple p-p
- **Total power consumption**: 0.15W (active); 0.075W (idle)

**Useful Drive Life**
- 35TB written, up to 20GB/day for 5 years

**Operating Temperature**
- 32° to 158° F (0° to 70° C)

**Relative Humidity**
- 5% to 95%

**Environmental**
- **Maximum Wet Bulb Temperature (operating)**: 84° F (29° C)
- **Shock**: 1,500 G/0.5-ms
## HP Blu-ray Writer Drive

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AMO Part Number</strong></td>
<td>AR482AA</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>5.25-inch, half-height, tray-load</td>
</tr>
<tr>
<td><strong>Orientation</strong></td>
<td>Either horizontal or vertical</td>
</tr>
<tr>
<td><strong>Interface type</strong></td>
<td>SATA</td>
</tr>
<tr>
<td><strong>Disc capacity</strong></td>
<td>50 GB DL or 25 GB standard</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 19.0 cm)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>2.0 lb (907 g)</td>
</tr>
<tr>
<td><strong>DVD-ROM</strong></td>
<td>8.5 GB DL or 4.7 GB standard</td>
</tr>
<tr>
<td><strong>Blu-ray</strong></td>
<td>50 GB DL or 25 GB standard</td>
</tr>
<tr>
<td><strong>Full Stroke DVD</strong></td>
<td>&lt; 250 ms (seek)</td>
</tr>
<tr>
<td><strong>Full Stroke CD</strong></td>
<td>&lt; 210 ms (seek)</td>
</tr>
<tr>
<td><strong>Blu-ray</strong></td>
<td>&lt; 275 ms (seek)</td>
</tr>
<tr>
<td><strong>CD-ROM Read</strong></td>
<td>CD-ROM up to 40X</td>
</tr>
<tr>
<td><strong>DVD-ROM Read</strong></td>
<td>DVD-RAM up to 5X</td>
</tr>
</tbody>
</table>

### Disc Capacity

<table>
<thead>
<tr>
<th>Type</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DVD-ROM Read</strong></td>
<td>DVD-RAM up to 5X</td>
</tr>
<tr>
<td><strong>CD-ROM Read</strong></td>
<td>CD-ROM up to 40X</td>
</tr>
<tr>
<td><strong>DVD-ROM Read</strong></td>
<td>DVD+RW up to 10X</td>
</tr>
</tbody>
</table>

### Startup Time

<table>
<thead>
<tr>
<th>Format</th>
<th>Time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD-ROM (SL/DL)</td>
<td>25S / 28S</td>
</tr>
<tr>
<td>BD-R (SL/DL)</td>
<td>25S / 28S</td>
</tr>
<tr>
<td>BD-RE (SL/DL)</td>
<td>25S / 28S</td>
</tr>
<tr>
<td>DVD-ROM (SL/DL)</td>
<td>18S / 18S</td>
</tr>
<tr>
<td>DVD-R (SL/DL)</td>
<td>25S / 25S</td>
</tr>
<tr>
<td>DVD+R (SL/DL)</td>
<td>25S / 25S</td>
</tr>
<tr>
<td>DVD+RW</td>
<td>DVD+RW 25S</td>
</tr>
<tr>
<td>DVD-RAM</td>
<td>45S</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>15S</td>
</tr>
</tbody>
</table>

**QuickSpecs**

HP Compaq Pro 4300 Small Form Factor Business PC

Technical Specifications - Removable Storage
### Maximum Data Transfer Rates

**DVD-RW** up to 10X  
**DVD+R DL** up to 8X  
**DVD-R DL** up to 8X  
**DVD-ROM** up to 16X  
**DVD-ROM DL** up to 8X  
**DVD+R** up to 12X  
**DVD-R** up to 12X  
**Blu-ray**  
**BD-ROM** up to 6X  
**BD-ROM DL** up to 4.8X  
**BD-R** up to 6X  
**BD-R DL** up to 4.8X  
**BD-R up to 6X**  
**BD-RE SL/DL** up to 4.8X

### Power

**Source**  
SATA DC power receptacle  
**DC Power Requirement**  
5 VDC ± 5% - 100 mV ripple p-p  
12 VDC ± 5% - 200 mV ripple p-p  
**DC Current**  
5 VDC - 1000 mA typical, 1600 mA maximum  
12 VDC - 600 mA typical, 1400 mA maximum

### Environmental

(all conditions non-condensing)  
**Temperature (operating)**  
41° to 122° F (5° to 50° C)  
**Relative Humidity (operating)**  
10% to 90%  
**Maximum Wet Bulb Temperature (operating)**  
86° F (30° C)

### HP SuperMulti DVD Writer Drive

**AMO Part Number**  
AR630AT  
**Height**  
5.25-inch, half-height, tray-load  
**Orientation**  
Either horizontal or vertical  
**Interface type**  
Serial ATA  
**Dimensions (W x H x D)**  
5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)  
**Weight (max)**  
2.6 lb (1.2 kg)  
**CD Media Read Access**  
Random  
Full Stroke  
**DVD Media Read Access**  
Random  
Full Stroke  
**Random**  
< 120 ms typical  
**Full Stroke**  
< 200 ms typical  
**Random**  
< 130 ms typical  
**Full Stroke**  
< 240 ms typical
## Technical Specifications - Removable Storage

<table>
<thead>
<tr>
<th>Media</th>
<th>Read/Write Transfer</th>
<th>Read Transfer</th>
<th>Write Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-ROM</td>
<td>Yes</td>
<td>Up to 6000 KB/s (40X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-R</td>
<td>Yes</td>
<td>Up to 4800 KB/s (32X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW (High speed)</td>
<td>1500 KB/s (10X)</td>
<td>Up to 3600 KB/s (24X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW (Ultra speed)</td>
<td>Up to 4800 KB/s (32X)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW (Ultra speed+)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW (Ultra speed+)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW (Ultra speed+)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>Up to 8100 KB/s (6X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD-ROM SL Read</td>
<td>Up to 21600 KB/s (16X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD-ROM DL Read</td>
<td>Up to 10800 KB/s (8X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD Video DL (other than playback)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R</td>
<td>Up to 21600 KB/s (16X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD+R</td>
<td>Up to 21600 KB/s (16X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RW</td>
<td>Up to 10800 KB/s (8X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>DVD+RW</td>
<td>Up to 10800 KB/s (8X)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
</tr>
<tr>
<td>CD-R Write</td>
<td>Up to 6000 KB/s (40X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW</td>
<td>600 KB/s (4X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD+R DL (v1.2)</td>
<td>Up to 16200 KB/s (12X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD+R DL (v1.1)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD+RW (Volume 2 v1.0)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD+RW (Volume 1 v1.3)</td>
<td>Up to 5400 KB/s (4X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R (v2.1 rev. 6.0)</td>
<td>Up to 16200 KB/s (12X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R (v2.1 rev. 4.0)</td>
<td>Up to 21600 KB/s (16X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R DL (v3.0 rev. 5.0)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R DL (v3.0 rev. 3.0)</td>
<td>Up to 10800 KB/s (8X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RW (v1.2 rev. 3.0)</td>
<td>8100 KB/s (6X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RW (v1.2 rev. 2.0)</td>
<td>Up to 5400 KB/s (4X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RAM (v2.2 rev. 5.0)</td>
<td>Up to 16200 KB/s (12X)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RAM (v2.2 rev. 2.0)</td>
<td>Up to 6750 KB/s (5X)</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
## Technical Specifications - Removable Storage

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>SATA DC power receptacle</td>
</tr>
</tbody>
</table>

### Power Supply

<table>
<thead>
<tr>
<th>DC Power Requirement</th>
<th>5 VDC ± 5%</th>
<th>12 VDC ± 5%</th>
<th>5 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Current</td>
<td>100 mV ripple p-p</td>
<td>200 mV ripple p-p</td>
<td>&lt;1000 mA (typical)</td>
</tr>
<tr>
<td>12 VDC ± 5%</td>
<td>1200 mA (typical)</td>
<td>2000 mA (max.)</td>
<td></td>
</tr>
<tr>
<td>Total Drive Power</td>
<td>&lt; 2.5W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Rear Panel

- SATA Power Connector, 15-pin
- SATA Data Connector, 7-pin
- Markings to identify each connector

### Environmental conditions (all conditions non-condensing)

- Operating Temperature: 41° to 122° F (5° to 50° C)
- Storage Temperature: –22° F to 140° F (–30° C to 60° C)
- Relative Humidity: 10% to 90%
- Maximum Wet Bulb Temperature: 86° F (30° C)
- Altitude: 0 to 10,171 ft. (0 to 3,100 meters)

### HP DVD-ROM Drive

- AMO Part Number: AR629AA
- Height: 5.25-inch, half-height, tray-load
- Orientation: Either horizontal or vertical
- Interface type: Serial ATA
- Dimensions (W x H x D): 5.8 x 1.7 x 6.9 in (14.8 x 4.2 x 17.5 cm)
- Weight (max): 2.1 lb (950 kg)

### CD Media Read Access

- Random: < 120 ms typical
- Full Stroke: < 200 ms typical

### DVD Media Read Access

- Random: < 130 ms typical
- Full Stroke: < 240 ms typical
- CD-ROM, CD-R Read: Up to 6000 KB/s (40X)
- CD-RW Read: Up to 4800 KB/s (32X)
QuickSpecs  

HP Compaq Pro 4300 Small Form Factor Business PC

Technical Specifications - Removable Storage

<table>
<thead>
<tr>
<th>Media Type</th>
<th>Read</th>
<th>Write</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-ROM</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>CD-R</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>CD-RW</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD-ROM</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD-ROM DL</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RAM</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD+R</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD+R DL</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD+RW</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD-RW</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DVD-R DL</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Media Compatibility

<table>
<thead>
<tr>
<th>Media Compatibility</th>
<th>Source</th>
<th>DC Power Requirement</th>
<th>DC Current</th>
<th>Total Drive Power (Standby Mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SATA DC power receptacle</td>
<td>5 VDC ± 5%</td>
<td>12 VDC ± 5%</td>
<td>5 VDC</td>
</tr>
</tbody>
</table>
Technical Specifications - Removable Storage

**Rear Panel**
- SATA Power Connector, 15-pin
- SATA Data Connector, 7-pin
- Markings to identify each connector

**Environmental conditions** (all conditions non-condensing)
- Operating Temperature: 41° to 122° F (5° to 50° C)
- Storage Temperature: −22° F to 140° F (−30° C to 60° C)
- Relative Humidity: 10% to 90%
- Maximum Wet Bulb Temperature: 86° F (30° C)
- Altitude: 0 to 10,171 ft. (0 to 3,100 meters)

**HP 22-n-1 Media Card Reader**
- USB 2.0 High-speed interface

**USB Interface**
- **Note:** Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.
- Supports hardware ECC (Error Correction Code) function
- Supports hardware CRC (Cyclic Redundancy Check) function
- Supports MS 4-bit parallel transfer mode
- Supports MS-PRO 4-bit parallel transfer mode
- Supports MS PRO-HG Duo 4-bit parallel transfer mode
- Supports SD 4-bit parallel transfer mode
- Supports high-speed 50Mhz SD 4-bit card (version 2.0)
- Supports high-speed 52Mhz MMC 8-bit card (version 4.2)
- Supports CF v4.0 with PIO mode 6 and Ultra DMA mode
- CompactFlash Type I
- CompactFlash Type II
- Microdrive
- MultiMediaCard (MMC)
- Reduced Size MultiMediaCard (RS MMC)
- MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC)
- Reduced Size MultiMediaCard 4.2 (MMC Mobile, including MMC Mobile HC)
- Secure Digital Card (SD)
- Secure Digital High Capacity (SDHC)
- miniSD
- miniSD High Capacity
QuickSpecs

HP Compaq Pro 4300 Small Form Factor Business PC

Technical Specifications - Removable Storage

Supported media type
- Micro SD (T-Flash)
- Micro SD HC
- Memory Stick
- Memory Stick Select
- Memory Stick Duo (MS Duo)
- Memory Stick PRO (MS PRO)
- Memory Stick PRO Duo (MS PRO Duo)
- Memory Stick PRO-HG Duo
- MagicGate Memory Stick (MG)
- MagicGate Memory Stick Duo
- xD-Picture Card

Supported media type with card adapter
- Memory Stick Micro (M2)
- MMC Micro

Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage.
- 10°C 10% R.H. = 24 hours
- 10°C 90% R.H. = 24 hours
- 20°C 90% R.H. = 24 hours
- 30°C 90% R.H. = 24 hours
- 40°C 90% R.H. = 24 hours
- 50°C 90% R.H. = 24 hours
- 50°C 10% R.H. = 24 hours

Operational Environmental Extremes

Environmental

Storage Environmental Extremes
- No power applied
- Delta °C < 1.0°C/min
- Delta % R.H. < 1.5% R.H./min

Approvals
- USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0
- Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3
- FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T
System Memory Support
Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The HP Compaq Pro 4300 Series PC supports non-ECC DDR3 memory with a data rate of 1600 MHz (limited to 1333 MHz due to chipset).

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

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

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

<table>
<thead>
<tr>
<th>Total Memory</th>
<th>Channel A</th>
<th>Socket</th>
<th>Channel B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 GB</td>
<td>1 (black)</td>
<td>2</td>
<td>2 GB</td>
</tr>
<tr>
<td>4 GB</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4 GB</td>
<td></td>
<td>2 GB</td>
<td>2 GB</td>
</tr>
<tr>
<td>6 GB</td>
<td></td>
<td>4 GB</td>
<td>2 GB</td>
</tr>
<tr>
<td>8 GB</td>
<td></td>
<td>8 GB</td>
<td></td>
</tr>
<tr>
<td>8 GB</td>
<td></td>
<td>4 GB</td>
<td>4 GB</td>
</tr>
<tr>
<td>16 GB</td>
<td></td>
<td>8 GB</td>
<td>8 GB</td>
</tr>
</tbody>
</table>
### Broadcom BCM 57788 Gigabit LAN with Lightning protection (integrated)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>RJ-45</td>
</tr>
<tr>
<td>Controller</td>
<td>Broadcom BCM 57788 Netlink Network Adapter</td>
</tr>
<tr>
<td>Data rates supported</td>
<td>10/100/1000 Mbps</td>
</tr>
<tr>
<td>Compliance</td>
<td>IEEE 802.3, 802.3ab and 802.3u compliant</td>
</tr>
<tr>
<td>Bus architecture</td>
<td>Single Channel, PCI-E</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>Bus-master DMA</td>
</tr>
<tr>
<td>Data rates supported</td>
<td>10/100/1000 Mbps</td>
</tr>
<tr>
<td>Power requirement</td>
<td>Max: 0.8W @ 3.3V. Low: 0.013W @ 3.3V</td>
</tr>
<tr>
<td>Boot ROM support</td>
<td>Yes</td>
</tr>
<tr>
<td>Network transfer mode</td>
<td>Full-duplex</td>
</tr>
<tr>
<td>Network transfer rate</td>
<td>Half-duplex (not supported for the 1000BASE-T transceiver)</td>
</tr>
<tr>
<td>Network transfer rate</td>
<td>10BASE-T (half-duplex) 10 Mbps</td>
</tr>
<tr>
<td></td>
<td>10BASE-T (full-duplex) 20 Mbps</td>
</tr>
<tr>
<td></td>
<td>100BASE-TX (half-duplex) 100 Mbps</td>
</tr>
<tr>
<td></td>
<td>100BASE-TX (full-duplex) 200 Mbps</td>
</tr>
<tr>
<td></td>
<td>1000BASE-T (full-duplex) 2000 Mbps</td>
</tr>
<tr>
<td>Environmental</td>
<td>Operating Temperature: 32° to 131°F (0° to 55°C)</td>
</tr>
<tr>
<td></td>
<td>To 70°C for external regulator</td>
</tr>
<tr>
<td></td>
<td>Operating Humidity: 85% at 131°F (55°C)</td>
</tr>
<tr>
<td>Management</td>
<td>WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic.</td>
</tr>
<tr>
<td>Alerting</td>
<td>ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0.</td>
</tr>
</tbody>
</table>

### Intel Gigabit CT Desktop Network Interface Controller

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>RJ-45</td>
</tr>
<tr>
<td>System Interface</td>
<td>PCI Express x1</td>
</tr>
<tr>
<td>Controller</td>
<td>Intel WG82574L Gigabit Ethernet Controller</td>
</tr>
<tr>
<td>Memory</td>
<td>Integrated Dual 48K configurable transmit receive FIFO Buffers</td>
</tr>
<tr>
<td>Data rates supported</td>
<td>10/100/1000 Mbps</td>
</tr>
<tr>
<td>Compliance</td>
<td>IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control</td>
</tr>
<tr>
<td>Bus architecture</td>
<td>PCI-E 1.0a</td>
</tr>
<tr>
<td>Data path width</td>
<td>X1, 250 MB/s, Bi-directional interface</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>Bus-master DMA</td>
</tr>
<tr>
<td>Hardware certifications</td>
<td>FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union</td>
</tr>
<tr>
<td>Power requirement</td>
<td>Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T</td>
</tr>
<tr>
<td>Boot ROM support</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Network Transfer Rate**
- 10BASE-T (half-duplex) 10 Mbps
- 10BASE-T (full-duplex) 20 Mbps
- 100BASE-TX (half-duplex) 100 Mbps
- 100BASE-TX (full-duplex) 200 Mbps
- 1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus)

**Environmental**
- Operating Temperature: 32° to 131°F (0° to 55° C)
- Operating Humidity: 85% at 131° F (55° C)

**Dimensions**
- 4.75 x 2.25 x 0.8 in (12.1 x 5.7 x 2.0 cm)

**Management**
- WOL, PXE, DMI, WFM 2.0

---

**HP 802.11 b/g/n Wireless Network Connection**

**Dimensions (L x H)**
- 2.8 x 2.2 in (7.0 x 5.7 cm)

**Weight**
- 0.08 lbs (40 g)

**Controller**
- Ralink RT2790

**System interface**
- PCI Express x1

**Network standard**
- 802.11 b/g/n

**Frequency band**
- 2.400 - 2.497 GHz

**Operating temperature**
- 14° to 149°F, operating (-10° to 65°C, operating)

**Storage temperature**
- -40° to 176°F, non-operating (-40° to 80°C, non-operating)

**Humidity**
- 10-90% operating
- 5-95% non-operating

**Operating voltage**
- 3.3V +/- 9%
- 12V +/- 8%

<table>
<thead>
<tr>
<th>Platform/WLAN Mode</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Power Consumption: 10 Watts</td>
<td></td>
</tr>
<tr>
<td>Transmit Only 4 Watts maximum averaged power over 1 second</td>
<td></td>
</tr>
<tr>
<td>Transmit Packet or Active Scanning 1000 mA peak current for 100 microseconds or longer</td>
<td></td>
</tr>
</tbody>
</table>

**Power Consumption**
- Receive Only Mode or Idle without IEEE PSP mode enabled 3 Watts maximum averaged over 1 second
- Idle, with IEEE PSP mode enabled 1.0 Watts maximum averaged over 1 second
- Transmit Disabled (turned off in software) 50 mW maximum, averaged over 1 second
- Platform in S3 or S4 (power removed from Low Profile PCI Express Card) 5 mW maximum, averaged over 1 second

**Output Power**
- 802.11b mode +19 dBm +/- 1.0 dB maximum
- 802.11g mode +17 dBm +/- 1.0 dB maximum
- EWC mode +17 dBm +/- 1.0 dB maximum (total power in all transmit chains)
Technical Specifications - Communications

Security
- IEEE and WiFi compliant 64 / 128 bit WEP encryption
- AES: CCM
- 802.1x authentication
- WPA: 802.1x. WPA-PSK and TKIP
- WPA2 certification
- IEEE 802.11i
- Cisco Certified Extensions, all versions through V5

Antenna
- HP part number 497317-003

Certifications
- Wi-Fi certified

Certifications for use by country
- United States, Canada, Peru, Taiwan
**High Definition Audio**

**Type** Integrated

**HD Stereo Codec** Realtek 2-channel ALC221 codec

**Audio I/O Ports**
- Front microphone-In (150-K ohm Input Impedance)
- Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver)
- Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load)
- Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load)
- Front Microphone/Headphone jack is re-task able to provide Microphone input, line-in or Headphone output to support connecting two headphones to the front of the system. When configured as a second front headphone output, both front headphone outputs are always driven with the same signal.

All ports are 3.5mm

**Internal Speaker Amplifier** 1.5W amplifier for the internal speaker only. External speakers must be powered externally. Rear Line-in audio port is re-taskable as either Line-in or Microphone-In.

**Multi-streaming Capable** Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks.

**Sampling** 8 kHz - 192 kHz

**Wavetable Syntheses** Yes – Uses OS soft wavetable

**Analog Audio** Yes

**# of Channels on Line-Out** Stereo (Left & Right channels)

**Internal Speaker** Yes

**External Speaker Jack** Yes

---

**HP Thin USB Powered Speakers**

**On/Off/Volume Controls** Right side of right speaker

**Power LED** Front of right speaker (green)

**Frequency Response** F0 to 20kHz

**Watts** 2/3 watt (normal/maximum)

**Dimensions/Speaker**
- 5.72 x 3.74 x 0.96 in
- 14.52 x 9.50 x 2.45 cm

**Net Weight**
- 0.68 lbs
- 0.31kg

**Color** Black

**Environmental** (all conditions non-condensing)
- Operating Temperature: 14° to 104° F (-10° to 40° C)
- Relative Humidity: 40% to 90%
- Input Cord: 5.91 ft (1800 mm)

**Speaker Cable Length**
- L-channel Cord: 3.28 ft (1000 mm)
- USB Cord: 5.91 ft (1800 mm)
**HP USB Standard Keyboard**

**Physical characteristics**
- **Keys**: 104, 105, 106, 107, 109 layout (depending upon country)
- **Dimensions** (L x W x H): 18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
- **Weight**: 2 lb (0.9 kg)
- **Operating voltage**: + 5VDC ± 5%
- **Power consumption**: 50-mA maximum (with three LEDs ON)
- **System interface**: USB Type A plug connector
- **ESD**: CE level 4, 15-kV air discharge
- **EMI - RFI**: Conforms to FCC rules for a Class B computing device
- **Microsoft® PC 99 - 2001**: Functionally compliant

**Electrical**
- **Languages**: 38 available
- **Keycaps**: Low-profile design
- **Switch actuation**: 55-g nominal peak force with tactile feedback
- **Switch life**: 20 million keystrokes (using Hasco modified tester)
- **Switch type**: Contamination-resistant switch membrane
- **Key-leveling mechanisms**: For all double-wide and greater-length keys
- **Cable length**: 6 ft (1.8 m)
- **Microsoft PC 99 - 2001**: Mechanically compliant

**Mechanical**
- **Acoustics**: 43-dBA maximum sound pressure level
- **Operating temperature**: 50° to 122° F (10° to 50° C)
- **Non-operating temperature**: -22° to 140° F (-30° to 60° C)
- **Operating humidity**: 10% to 90% (non-condensing at ambient)
- **Non-operating humidity**: 20% to 80% (non-condensing at ambient)

**Environmental**
- **Operating shock**: 40 g, six surfaces
- **Non-operating shock**: 80 g, six surfaces
- **Operating vibration**: 2-g peak acceleration
- **Non-operating vibration**: 4-g peak acceleration
- **Drop (out of box)**: 26 in (66 cm) on carpet, six-drop sequence
- **Drop (in box)**: 42 in (107 cm) on concrete, 16-drop sequence

**Approvals**
- UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC
Technical Specifications - Input/Output Devices

**Ergonomic compliance**
ANSI HFS 100, ISO 9241-4, and TUVGS

**Kit contents**
- Keyboard
- Installation Guide
- Warranty Card
- Safety and Comfort Guide

**HP PS/2 Standard Keyboard**

- **Keys**
  - 104, 105, 106, 107, 109 layout (depending upon country)

- **Physical Characteristics**
  - **Dimensions**
    - (L x W x H)
    - 18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
  - **Weight**
    - 2 lb (0.9 kg) minimum
  - **Operating voltage**
    - + 5VDC ± 5%
  - **Power consumption**
    - 50-mA maximum (with three LEDs ON)
  - **System interface**
    - PS/2 6-pin mini din connector

- **Electrical**
  - **ESD**
    - CE level 4, 15-kV air discharge
  - **EMI - RFI**
    - Conforms to FCC rules for a Class B computing device
  - **Microsoft PC 99 - 2001**
    - Functionally compliant
  - **Languages**
    - 38 available
  - **Keycaps**
    - Low-profile design
  - **Switch actuation**
    - 55-g nominal peak force with tactile feedback
  - **Switch life**
    - 20 million keystrokes (using Hasco modified tester)
  - **Switch type**
    - Contamination-resistant switch membrane
  - **Key-leveling mechanisms**
    - For all double-wide and greater-length keys
  - **Cable length**
    - 6 ft
    - 1.8 m

- **Microsoft PC 99 - 2001**
  - Mechanically compliant

- **Acoustics**
  - 43-dBA maximum sound pressure level

- **Operating temperature**
  - 50° to 122° F (10° to 50° C)

- **Non-operating temperature**
  - -22° to 140° F (-30° to 60° C)

- **Operating humidity**
  - 10% to 90% (non-condensing at ambient)

- **Non-operating humidity**
  - 20% to 80% (non-condensing at ambient)

- **Operating shock**
  - 40 g, six surfaces

- **Non-operating shock**
  - 80 g, six surfaces

- **Operating vibration**
  - 2-g peak acceleration
HP USB PS/2 Washable Keyboard

Introduction:

The HP USB PS2 Washable Keyboard is well-suited for environments that require keyboards to be immersed and cleaned with the following solvents: soap, washing-up liquid, non-abrasive cleaners, general purpose cleaners, bleach, disinfectant, antibacterial cleaners and surgical spirit. The HP USB PS2 Washable Keyboard provides protection against ingress of water and dust to code IP66 defined in IEC (International Electro Technical Commission) standard 60529-1 and code 4X as defined in NEMA (National Electrical Manufacturers Association) standard 250. The code IP66 defined in the IEC standard 60529 means the keyboard is protected against the ingress of dust, and that high pressure water jets from any direction will not have any harmful effects. A NEMA 4X enclosure as defined in NEMA standard 250 will provide protection against windblown dust, rain, splashing water and hose directed water. For additional information on regulatory standards consult your legal department.

NOTE: Observe the manufacturer's instructions for the preparation and use of all cleaning fluids and wear the appropriate protective clothing.

WARNING: To reduce the risk of electric shock, avoid using the keyboard with a computer in wet locations.

Key Benefits

- SpillSeal® keyboard technology protection; provides protection from liquids and dust as defined in IEC standard 60529-1, code IP66, and NEMA standard 250, code 4X
- Sealed structure able to be fully washed under running water (If the USB plug [connector] gets wet, shake dry before reconnecting.)
- Waterproof exterior that protects against windblown dust, rain, splashing water and hose-directed water
- USB extension cable allows the keyboard to be easily disconnected without having to access the computer
- Plug and play capability when using supported Microsoft Windows operating systems. No additional software drivers are required
- USB or PS2 connection
- User selectable, zero degree slope for potential wrist posture improvement and associated usage comfort
- Key mechanism lifecycle rated at 10 million keystrokes

Compatibility

The HP USB/PS2 Washable Keyboard is compatible with all HP Compaq Business PCs

Service and Support

Your Option Limited Warranty is a one (1) year (HP Option Limited Warranty Period) parts replacement warranty on any HP-branded or Compaq-branded options (HP Options). If your HP Option is installed in an HP Hardware Product, HP may provide warranty service either for the HP Option Limited Warranty Period or the remaining Limited Warranty Period of the HP Hardware Product in which the HP Option is being installed, whichever period is the longer but not to exceed three (3) years from the date you purchased the HP Option.
## Physical Characteristics

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keys</td>
<td>104 (US) layout or 105 (EU) layout (depending upon country)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>17.67 x 6.62 x 1.38 in (449 x 168 x 35 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.7 lb (0.77 kg minimum)</td>
</tr>
</tbody>
</table>

### Electrical

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>+5VDC ±5%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>50-mA maximum (with three LEDs ON)</td>
</tr>
<tr>
<td>System interface</td>
<td>USB Type A plug connector</td>
</tr>
<tr>
<td>ESD</td>
<td>CE level 4, 15-kV air discharge</td>
</tr>
<tr>
<td>EMI - RFI</td>
<td>Conforms to FCC rules for a Class B computing device</td>
</tr>
<tr>
<td>Microsoft® PC 99 - 2001</td>
<td>Functionally compliant</td>
</tr>
</tbody>
</table>

### Mechanical

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keycaps</td>
<td>Stepped-profile design</td>
</tr>
<tr>
<td>Switch actuation</td>
<td>55-g nominal peak force with tactile feedback</td>
</tr>
<tr>
<td>Switch life</td>
<td>20 million keystrokes</td>
</tr>
<tr>
<td>Switch type</td>
<td>Contamination-resistant switch membrane</td>
</tr>
<tr>
<td>Key-leveling mechanisms</td>
<td>For all double-wide and greater-length keys</td>
</tr>
<tr>
<td>Cable length</td>
<td>7 ft (2.2 m)</td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>50° to 122° F (10° to 50° C)</td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>-22° to 140° F (-30° to 60° C)</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>10% to 95% (non-condensing at ambient)</td>
</tr>
<tr>
<td>Non-operating humidity</td>
<td>0% to 95% (non-condensing at ambient)</td>
</tr>
<tr>
<td>Operating shock</td>
<td>40 g, six surfaces</td>
</tr>
<tr>
<td>Non-operating shock</td>
<td>80 g, six surfaces</td>
</tr>
<tr>
<td>Operating vibration</td>
<td>2-g peak acceleration</td>
</tr>
<tr>
<td>Non-operating vibration</td>
<td>4-g peak acceleration</td>
</tr>
<tr>
<td>Drop (out of box)</td>
<td>26 in (66 cm) on carpet, six-drop sequence</td>
</tr>
<tr>
<td>Drop (in box)</td>
<td>42 in (107 cm) on concrete, 16-drop sequence</td>
</tr>
</tbody>
</table>

### Approvals

- UL, cUL, FCC, CE, TUV GS, VCCI, BSMI, C-Tick, KCC, USB-IF, WHQL, EN/IEC 60601-1, IP66/NEMA4X

### Ergonomic compliance

- ANSI HFS 100, ISO 9241-4, and TUVGS
Kit contents
Keyboard with USB cable, USB-to_PS2 adapter, Quick disconnect cable with extension to lengthen your cable, I/O Security Software & Documentation CD including the safety and comfort guide, warranty card

HP USB Smart Card (CCID) Keyboard
Introduction:
Boost your security, simplify access procedures and reduce the costs associated with managing networks by preventing unauthorized access to your computers and networks using smartcard technology with the HP Smart Card (CCID) Keyboard.

The USB Smart Card (CCID) Keyboard is a full-sized keyboard that takes advantage of digital signatures and certificates to secure the environment for transactions performed on both public and private networks. The USB Smart Card (CCID) Keyboard works with all smart cards that comply with ISO standard 7816.

Smart cards are easy-to-use credit card-sized devices which require multiple forms of information to be validated before you gain access to your accounts or resources. Used worldwide, smart cards strengthen access to a network or other resource using dual-factor authentication. Implementing a two-factor authentication (or multi-factor authentication) process reduces the risk of unauthorized access by verifying and validating your identity in one of the following ways:

- Something you know – a combination of username and password or PIN
- Something you have – a smart card or security token.

Something you have (smart card) plus something you know (PIN), improves user-access security within corporate network environments. Smart cards are used in government agencies, healthcare companies and the finance industry.

HP Client Security Smart Card Manager provides authentication software for the smart card. The Smart Card Reader module works with the HP Client Security Manager and enables the user to setup, use, and manage the smart card. This allows strengthened security with HP patented technology.

Key Benefits:
- Protects against unauthorized access with smart card technology
- Delivers even greater security when combined with a HP Client Security smart card and the HP Client Security Software
- Combination of username and password or pin with a smart card or security token
- Secures online transactions using digital signatures and certificates
- Conforms to industry standards for ease of setup and use
- Delivers long product life and quiet operation with high-impact materials and lubricated keys
- Spill drain feature

<table>
<thead>
<tr>
<th>Keys</th>
<th>104, 105, 106, 107, 109 layout (depending upon country)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form factor</td>
<td>USB basic smart card keyboard</td>
</tr>
<tr>
<td>Colors</td>
<td>Carbonite/Silver</td>
</tr>
<tr>
<td>Dimensions</td>
<td>18.2 x 6.3 x 1.3 in</td>
</tr>
<tr>
<td>(H x W x D)</td>
<td>46.3 x 16.1 x 3.3 cm</td>
</tr>
<tr>
<td>Weight</td>
<td>2 lb (0.9 kg) minimum</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>+ 5VDC ± 5%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>100-mA maximum (with four LEDs ON)</td>
</tr>
<tr>
<td>System interface</td>
<td>USB Type A plug connector</td>
</tr>
<tr>
<td>ESD</td>
<td>CE level 4, 15-kV air discharge</td>
</tr>
</tbody>
</table>

Physical Characteristics

Electrical

---

QuickSpecs
HP Compaq Pro 4300 Small Form Factor Business PC

Technical Specifications - Input/Output Devices
### Technical Specifications - Input/Output Devices

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMI - RFI</strong></td>
<td>Conforms to FCC rules for a Class B computing device</td>
</tr>
<tr>
<td><strong>Microsoft PC 99 - 2001</strong></td>
<td>Functionally compliant</td>
</tr>
<tr>
<td><strong>Languages</strong></td>
<td>30+ available</td>
</tr>
<tr>
<td><strong>Keycaps</strong></td>
<td>Standard design</td>
</tr>
<tr>
<td><strong>Switch actuation</strong></td>
<td>55 g nominal peak force with tactile feedback</td>
</tr>
<tr>
<td><strong>Switch life</strong></td>
<td>20 million keystrokes</td>
</tr>
<tr>
<td></td>
<td>(using Hasco modified tester)</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Switch type</strong></td>
<td>Contamination-resistant membrane</td>
</tr>
<tr>
<td><strong>Key-leveling mechanisms</strong></td>
<td>For all double-wide and greater-length keys</td>
</tr>
<tr>
<td><strong>Cable length</strong></td>
<td>6 ft (1.8 m)</td>
</tr>
<tr>
<td><strong>Microsoft PC 99 - 2001</strong></td>
<td>Mechanically compliant</td>
</tr>
<tr>
<td><strong>Acoustics</strong></td>
<td>43-dBA maximum sound pressure level</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>50° to 122° F (10° to 50° C)</td>
</tr>
<tr>
<td><strong>Non-operating temperature</strong></td>
<td>-22° to 140° F (-30° to 60° C)</td>
</tr>
<tr>
<td><strong>Operating humidity</strong></td>
<td>10% to 90% (non-condensing at ambient)</td>
</tr>
<tr>
<td><strong>Non-operating humidity</strong></td>
<td>20% to 80% (non-condensing at ambient)</td>
</tr>
<tr>
<td><strong>Operating shock</strong></td>
<td>40 g, six surfaces</td>
</tr>
<tr>
<td><strong>Non-operating shock</strong></td>
<td>80 g, six surfaces</td>
</tr>
<tr>
<td><strong>Operating vibration</strong></td>
<td>2-g peak acceleration</td>
</tr>
<tr>
<td><strong>Non-operating vibration</strong></td>
<td>4-g peak acceleration</td>
</tr>
<tr>
<td><strong>Drop</strong> (out of box)</td>
<td>26 in (66 cm) on carpet, six-drop sequence</td>
</tr>
<tr>
<td><strong>Drop</strong> (in box)</td>
<td>42 in (107 cm) on concrete, 16-drop sequence</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>All ISO 7816 smart cards</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>SCM STCIII</td>
</tr>
<tr>
<td><strong>Standard APIs supported</strong></td>
<td>PC/SC, EMV2000, CT-API</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>USB Port</td>
</tr>
<tr>
<td></td>
<td>Short circuit detection (protects smart card and reader)</td>
</tr>
<tr>
<td></td>
<td>Power supply compliant with ISO7816 and EMV (5V, 60 mA)</td>
</tr>
<tr>
<td></td>
<td>Supports 3-V and 5-V cards</td>
</tr>
<tr>
<td><strong>SmartCard Function</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>100-mA maximum draw</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>9600 bps to 330,000 bps</td>
</tr>
<tr>
<td></td>
<td>From computer</td>
</tr>
<tr>
<td></td>
<td>12 Mbps (USB transfer speed)</td>
</tr>
<tr>
<td><strong>Landing mechanism</strong></td>
<td>Friction contact</td>
</tr>
<tr>
<td><strong>Card insertions rating</strong></td>
<td>Up to 100,000 insertion cycles</td>
</tr>
<tr>
<td><strong>Interface modes</strong></td>
<td>CCID protocol</td>
</tr>
<tr>
<td><strong>Reader performance interface</strong></td>
<td>USB connection</td>
</tr>
<tr>
<td><strong>Electro-magnetic standards</strong></td>
<td>Europe 2004/108/EC</td>
</tr>
<tr>
<td></td>
<td>USA USAFCC part 15</td>
</tr>
</tbody>
</table>
QuickSpecs

Technical Specifications - Input/Output Devices

Approvals
CE-Mark, UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, EMV2000, USB-IF

Ergonomic Compliance
ISO 9241-4, TUVGS

Kit Contents
Keyboard, I/O Security and Documentation CD, warranty card

HP Wireless Keyboard and Mouse

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimensions (H x L x W)</th>
<th>Weight – Without Two AA Alkaline Batteries</th>
<th>Weight - Without Two AA Alkaline Batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyboard</td>
<td>1.47 x 18.06 x 6.43 in</td>
<td>1.96 lb (890 g)</td>
<td>1.47 x 18.06 x 6.43 in</td>
</tr>
<tr>
<td>Mouse</td>
<td>1.51 x 4.69 x 2.71 in</td>
<td>0.17 lb (80 g)</td>
<td>1.51 x 4.69 x 2.71 in</td>
</tr>
<tr>
<td>Receiver</td>
<td>0.31 x 0.72 x 2.24 in</td>
<td>0.27 oz (7.6 g)</td>
<td>0.31 x 0.72 x 2.24 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

System Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Safety: UL; CSA/TUV (Europe only); CE Mark</td>
</tr>
<tr>
<td>Ergonomics: ANSI; ISO (Europe only); GS Mark (Germany only)</td>
</tr>
<tr>
<td>EMC: FCC; CISPR; ACA; BSMI; MIC; VCCI</td>
</tr>
<tr>
<td>System Requirements: CE Mark</td>
</tr>
<tr>
<td>Design Guidelines for PCs: PC 99 - connector overmold colors; PC 2001 - full functionality</td>
</tr>
<tr>
<td>Telecom: All local telecom requirements and approvals for intended markets</td>
</tr>
<tr>
<td>USA: FCC Part 15 Equipment Certificate; CFR 47, Part 15; other local requirements</td>
</tr>
<tr>
<td>Country Support: US, Belgium, Switzerland, Spain, Denmark, Netherlands, France, Germany, Italy, Portugal, Sweden, Norway, Finland, UK, Poland, Czech Republic, Turkey, Greece, Austria, Bulgaria, Cyprus, Estonia, Hungary, Ireland, Latvia, Lithuania, Luxemburg, Malta, Romania, Slovakia, Slovenia, Vietnam, HK, Australia, NZ, Malaysia, Singapore, Indonesia, Philippines, and Thailand.</td>
</tr>
</tbody>
</table>
### HP PS/2 Optical Mouse

**Dimensions**

(Height x Length x Width)

1.56 x 2.44 x 4.61 in (3.95 x 6.21 x 11.7 cm)

**Weight**

4.44 oz (126 g)

**Environmental**

- **Operating temperature**: -32° to 104°F (0° to 40° C)
- **Non-operating temperature**: -4° to 140°F (-20° to 60° C)
- **Operating humidity**: 10% to 90% (non-condensing at ambient)
- **Non-operating humidity**: 10% to 90% (non-condensing at ambient)

**Operating shock**: 40 g, 6 surfaces

**Non-operating shock**: 80 g, 6 surfaces

**Operating vibration**: 2 g peak acceleration

**Non-operating vibration**: 4 g peak acceleration

**Drop**

80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face

**Operating voltage**: 5 VDC ± 10%

**Power consumption**: 100mA

**System consumption**

- **ESD**: CE level 4, 15 kV air discharge
- **EMI-RFI**: Conforms to FCC rules for a Class B computing device
- **Microsoft PC99 - 2001**: Functionally compliant

**Resolution**: 400 ± 20% DPI

**Tracking speed**: 10 in/s (25.4 cm/s) maximum

**Acceleration**: 100 in/s/s (2.54 m/s/s)

**Switch actuation**: 61 g nominal peak force

**Switch life**: 3,000,000 operations (using Hasco modified tester)

**Switch type**: Low force micro-switches

**Tracking mechanism life**: 155 mi (250 km) at average speed of 10 in/s

**Cable length**: 6 ft (1.8 m)

**Microsoft PC99 - 2001**: Mechanically compliant

**Width**: 8 mm
QuickSpecs

HP Compaq Pro 4300 Small Form Factor Business PC

Technical Specifications - Input/Output Devices

<table>
<thead>
<tr>
<th>Scroll wheel</th>
<th>Diameter</th>
<th>1.01 in (25.6 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum rotation speed</td>
<td>48 rats/sec</td>
</tr>
<tr>
<td></td>
<td>Switch type</td>
<td>Light force micro-switch</td>
</tr>
<tr>
<td></td>
<td>Switch life</td>
<td>1 million operations</td>
</tr>
<tr>
<td></td>
<td>Mechanical life</td>
<td>Minimum 200,000 revolutions</td>
</tr>
</tbody>
</table>

Regulatory Approvals

UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

HP USB Optical Mouse

Dimensions

(H x L x W)

1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)

Weight

0.27 lb (0.12 kg)

Cable length

72.8 in (185 cm)

System requirements

Available USB port

HP USB PS/2 Washable Mouse

The HP USB PS2 Washable Mouse is a USB based mouse that is designed to be taken apart (disassembled), when it becomes soiled, or in the event that something is spilled on it. The mouse can be immersed for cleaning with the following solvents: soap, washing-up liquid, non-abrasive cleaners, general purpose cleaners, bleach, disinfectant, antibacterial cleaners and surgical spirit. The HP USB PS2 Washable Mouse provides protection against ingress of water and dust to code IP66 defined in IEC (International Electro Technical Commission) standard 60529-1 and code 4X as defined in NEMA (National Electrical Manufacturers Association) standard 250. The code IP66 defined in the IEC standard 60529 means the mouse is protected against the ingress of dust, and that high pressure water jets from any direction will not have any harmful effects. A NEMA 4X enclosure as defined in NEMA standard 250 will provide protection against windblown dust, rain, splashing water and hose directed water. For additional information on regulatory standards consult your legal department.

NOTE: Observe the manufacturer’s instructions for the preparation and use of all cleaning fluids and wear the appropriate protective clothing.

WARNING: To reduce the risk of electric shock, avoid using the keyboard with a computer in wet locations.

Key Benefits

- Sealed structure able to be fully washed under running water
- Waterproof exterior that protects against windblown dust, rain, splashing water, hose-directed water, and damage from external ice formation
- Removable scroll wheel that clips back into place after cleaning
- SpillSeal® mouse technology protection, which provides protection from liquids and dust as defined in IEC standard 60529-1, code IP66, and NEMA standard 250, code 4X
- Plug and play capability when using supported Microsoft Windows operating systems. No additional software drivers are required
- USB or PS2 connection
- Optical tracking with two standard buttons and a third button located in the center for highlighting
QuickSpecs

HP Compaq Pro 4300 Small Form Factor Business PC

Technical Specifications - Input/Output Devices

Compatibility
The HP USB/PS2 Washable Mouse is compatible with all HP Compaq Business PCs.

Service and Support
Your Option Limited Warranty is a one (1) year (HP Option Limited Warranty Period) parts replacement warranty on any HP-branded or Compaq-branded options (HP Options). If your HP Option is installed in an HP Hardware Product, HP may provide warranty service either for the HP Option Limited Warranty Period or the remaining Limited Warranty Period of the HP Hardware Product in which the HP Option is being installed, whichever period is the longer but not to exceed three (3) years from the date you purchased the HP Option.

Dimensions (H x L x W)
1.56 x 2.44 x 4.61 in
3.95 x 6.21 x 11.7 cm

Weight
4.44 oz
126g

Electrical
Operating voltage
5 VDC ± 10%

Power consumption
100mA

System consumption
PS/2 mini-din connector or USB

ESD
CE level 2 8 kV air discharge

EMI-RFI
Conforms to FCC rules for a Class B computing device

Microsoft® PC99 – 2001
Functionally compliant

Environmental
Operating temperature
–32° to 104°F (0° to 40° C)

Non-operating temperature
–4° to 140°F (~20° to 60° C)

Operating humidity
10% to 90% (non-condensing at ambient)

Non-operating humidity
10% to 90% non-condensing

Operating shock
40 g, 6 surfaces

Non-operating shock
80 g, 6 surfaces

Operating vibration
2 g peak acceleration

Non-operating vibration
4 g peak acceleration

Drop (out of box)
80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face

Scroll wheel
Width
6 mm

Diameter
1 in (25.4 mm)

Maximum rotation speed
48 rats/sec

Switch type
Light force micro-switch

Switch life
3 million operations

Mechanical life
Minimum 200,000 revolutions
## QuickSpecs

### HP Compaq Pro 4300 Small Form Factor Business PC

#### Technical Specifications - Input/Output Devices

<table>
<thead>
<tr>
<th>Regulatory approvals</th>
<th>Compliant</th>
<th>FCC, CE Mark, ICES-003-B, IP66/NEMA4X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>Operating system support</td>
<td>Windows Vista Business 64, Windows Vista Business 32, Windows Vista Home Basic 32, Windows 2000, Windows XP Professional or Windows XP Home 32 (No driver is required for this device. Native support is provided by the operating system.), xpe, ce.net, Linux, XP-64</td>
</tr>
</tbody>
</table>

### HP USB Laser Mouse

<table>
<thead>
<tr>
<th>Scroll Wheel</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Rotation Speed</td>
<td>48 rats/sec</td>
</tr>
<tr>
<td>Switch Type</td>
<td>Wheel</td>
</tr>
</tbody>
</table>
| Switch Life           | Button - 3,000,000  
  Wheel - 1,000,000 times  
  Tilt switch - 500,000 times |

### Environmental

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>32° to 104° F (0° to 40° C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-operating Temperature</td>
<td>-4° to 140° F (-20° to 60° C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>10% to 90% (non-condensing at ambient)</td>
</tr>
<tr>
<td>Non-operating Humidity</td>
<td>20% to 80% (non-condensing at ambient)</td>
</tr>
<tr>
<td>Operating Shock</td>
<td>40 g, six surfaces</td>
</tr>
<tr>
<td>Non-operating Shock</td>
<td>80 g, six surfaces</td>
</tr>
<tr>
<td>Operating Vibration</td>
<td>2-g peak acceleration</td>
</tr>
<tr>
<td>Non-operating Vibration</td>
<td>4-g peak acceleration</td>
</tr>
</tbody>
</table>

### Electrical

<table>
<thead>
<tr>
<th>Operating Voltage</th>
<th>+ 5VDC ± 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>&gt; 150,000 hrs</td>
</tr>
<tr>
<td>MTBF</td>
<td></td>
</tr>
<tr>
<td>ESD</td>
<td>IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV</td>
</tr>
<tr>
<td>EMI-RFI</td>
<td>FCC Class B</td>
</tr>
<tr>
<td>PC98</td>
<td>PC 99 Compliant</td>
</tr>
</tbody>
</table>

### Mechanical

<table>
<thead>
<tr>
<th>Resolution</th>
<th>800dpi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracking Speed</td>
<td>25 cm/sec</td>
</tr>
<tr>
<td>Acceleration</td>
<td>0.5mm</td>
</tr>
<tr>
<td>Switch Actuation</td>
<td>0.6N (60gf)</td>
</tr>
<tr>
<td><strong>QuickSpecs</strong></td>
<td><strong>HP Compaq Pro 4300 Small Form Factor Business PC</strong></td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------</td>
</tr>
</tbody>
</table>

## Technical Specifications - Input/Output Devices

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch Life</td>
<td>Button - 3,000,000</td>
</tr>
<tr>
<td></td>
<td>Wheel - 1,000,000 times</td>
</tr>
<tr>
<td></td>
<td>Tilt switch - 500,000 times</td>
</tr>
<tr>
<td>Cable Length</td>
<td>1850mm</td>
</tr>
<tr>
<td>PC98-99</td>
<td>PC99 compliant</td>
</tr>
</tbody>
</table>

## Regulatory Approvals

UL60950-1, UL 94, UL 746 (A-E), UL 796  
TUV/GS: EN 60950-1, EN 60825-1  
FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL
Unit Environment and Operating Conditions

General Unit Operating Guidelines

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

Temperature Range
- Operating: 50° to 95° F (10° to 35° C)*
- Non-operating: –22° to 140° F (–30° to 60° C)

Relative Humidity
- Operating: 10% to 90% (non-condensing at ambient)
- Non-operating: 5% to 95% (non-condensing at ambient)

Maximum Altitude
- (unpressurized) Operating: 10,000 ft (3048 m)
- Non-operating: 30,000 ft (9144 m)

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

Power Supply

Standard Efficiency
- 240W active PFC
- 70% @ 100% load

High Efficiency
- 240W active PFC
- 82/85/82% @ 20/50/100% load

Max Power Rating
- 240W

Power Factor Correcting (PFC)
- Active

Rated Line Frequency
- 50/60 Hz

Operating Line Frequency Range
- 47 – 63 Hz

Maximum Voltage Range
- 115 VAC: 90 - 140 VAC
- 220VAC: 180 - 264 VAC

Nominal Voltage Range
- 115 VAC: 100 - 127 VAC
- 220VAC: 200 - 240 VAC

Rated Input Current
- =4A

Maximum allowable leakage Current (NFPA 99)
- 275 µA

Power Supply Fan
- 92mm variable speed

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

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 2-second pause, then repeats:
    - 2 - processor thermal protection activated
    - 3 - processor not installed
    - 4 - power supply failure
    - 5 - memory error
    - 6 - video error
    - 7 - PCA failure (ROM detected failure prior to video)
    - 8 - invalid ROM, bootblock recovery mode
    - 9 - system not fetching code
    - 10 - system hang while loading an option ROM
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Green Pull Tabs, and Quick Release Latches for easy Identification

**Additional Features**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASF 2.0 support (Alert Standard Format)</td>
<td>Industry-standard specification for network alerting in operating system-absent environments</td>
</tr>
<tr>
<td>Computrace</td>
<td>Computrace agent support standard</td>
</tr>
<tr>
<td>Towerable Orientation</td>
<td>Product can be oriented as either a desktop or a tower</td>
</tr>
<tr>
<td>Drive Lock</td>
<td>Implementation of the industry standard ATA Security feature set. When enabled, it prevents software access to user data on the drive until one or two user-defined passwords are provided.</td>
</tr>
<tr>
<td></td>
<td>DPS Access through F10 Setup during Boot</td>
</tr>
<tr>
<td></td>
<td>A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user</td>
</tr>
</tbody>
</table>
### Technical Specifications – Miscellaneous Features

**Drive Protection System**
- Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer’s setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced.
- The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.

**SMART Technology (Self-Monitoring, Analysis and Reporting Technology)**
- Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted.

**SMART I - Drive Failure Prediction**
- Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count.

**SMART II - Off-Line Data Collection**
- By avoiding actual hard drive failures, SMART hard drives act as “insurance” against unplanned user downtime and potential data loss from hard drive failure.

**SMART III - Off-Line Read Scanning with Defect Reallocation**
- IOEDC: I/O Error Detection Circuitry
- Detects errors in Read/Write buffers on HDD cache RAM.

**SMART IV - End-to-End CRC for hard drives**
- Interface in F10 setup provides confirmation of SMART IV support.
This product series has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US ENERGY STAR®
- IT ECO declaration
- EPEAT Gold where HP registers commercial desktop products. See [http://www.epeat.net](http://www.epeat.net) for registration status in your country

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Small Form Factor Desktop model is based on a typically configured product.

### Energy Consumption

<table>
<thead>
<tr>
<th>Voltage</th>
<th>115 VAC</th>
<th>230 VAC</th>
<th>100 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>39.02 W</td>
<td>38.59 W</td>
<td>39.27 W</td>
</tr>
<tr>
<td>W</td>
<td>2.26 W</td>
<td>2.43 W</td>
<td>2.26 W</td>
</tr>
<tr>
<td>W</td>
<td>0.86 W</td>
<td>1.01 W</td>
<td>0.85 W</td>
</tr>
</tbody>
</table>

Note: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured model.

### Heat Dissipation*

<table>
<thead>
<tr>
<th>Voltage</th>
<th>115 VAC</th>
<th>230 VAC</th>
<th>100 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTU/hr</td>
<td>133 BTU/hr</td>
<td>132 BTU/hr</td>
<td>134 BTU/hr</td>
</tr>
<tr>
<td>BTU/hr</td>
<td>8 BTU/hr</td>
<td>8 BTU/hr</td>
<td>8 BTU/hr</td>
</tr>
<tr>
<td>BTU/hr</td>
<td>3 BTU/hr</td>
<td>3 BTU/hr</td>
<td>3 BTU/hr</td>
</tr>
</tbody>
</table>

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

### Declared Noise Emissions

(in accordance with ISO 7779 and ISO 9296)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sound Power (LWAd, bels)</th>
<th>Sound Pressure (LpAm, decibels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle</td>
<td>3.7</td>
<td>30</td>
</tr>
<tr>
<td>Fixed Disk</td>
<td>4</td>
<td>32</td>
</tr>
</tbody>
</table>

### Longevity and Upgrading

This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- Intel LGA775 processor socket
- 8 USB ports
- 1 empty PCI slot (w/ optional PCI riser card), or 1 empty PCIe x16 slot (w/optional PCIe riser card)
- 1 internal drive slot
- 1 Slimline optical drive slot
- 3 memory slots
- 1 Serial/Parallel Port (optional)

Spare parts are available throughout the warranty period and or for up to “5” years after the end of production
Battery

The battery(s) in this product complies with EU Directive 2006/66/EC, and does not contain:

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

Battery Size

CR2032 (coin cell)

Battery Type

Lithium

Additional Information

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC.

This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country.

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

This product contains 0% post-consumer recycled plastic (by wt.).

This product is 93.9% recyclable when properly disposed of at end of life.

Packaging Materials

External

Paper Corrugated - 2300 g

Internal

PLASTIC/EPS (Expanded Polystyrene) - 63.4 g
PLASTIC/Polyethylene low density - 56 g
PLASTIC/Polypropylene - 15 g

The PAPER/Corrugated packaging material contains at least 30.66% recycled content.

The PLASTIC/EPS (Expanded Polystyrene) packaging material contains at least 5% recycled content.

The PLASTIC/Polyethylene low density packaging material contains at least 5% recycled content.

The PLASTIC/Polypropylene packaging material contains at least 5% recycled content.

RoHS Compliance

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

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at: http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
Mercuric Oxide Batteries
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)
Nickel finishes that release greater than 0.5 micro-grams/cm²/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

Packaging
HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling
Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information
For more information about HP's commitment to the environment:
Global Citizenship Report
Eco-label certifications
ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html
QuickSpecs

Communication Devices

- Intel Pro 1000 CT2 Gigabit NIC (PCIe x1)
- Broadcom NetXtreme GbE Ethernet Plus NIC (PCIe x1)
- HP Wireless 802.11 b/g/n NIC (PCIe x1)

Part Number
- FH969AA
- FS215AA
- FH971AA

Graphics Solutions

- AMD Radeon HD 6350 Graphics (PCIe x16)
- AMD Radeon HD 7450 Graphics
- Nvidia NVS 300 Graphics (PCIe x16)
- Nvidia NVS 310 Graphics (PCIe x16)

Part Number
- QK638AA
- B1R44AA
- BV456AA
- A7U59AA

Adapters & Cables

- HP DisplayPort Cable Kit
- HP DisplayPort To Dual Link DVI-D Adapter
- HP DisplayPort To DVI-D Adapter
- HP DisplayPort to HDMI Adapter
- HP DisplayPort to VGA Adapter
- HP DMS-59 to Dual DVI Cable
- HP DMS-59 to Dual DisplayPort Adapter
- HP DVI Cable Kit
- HP USB Graphics Adapter

Part Number
- VN567AA
- NR078AA
- FH973AA
- BP937AA
- A5615AA
- DL139A
- XP688AA
- DL198AT
- NL571AA

Data Storage Drives and Accessories

- HP 128 GB SATA Solid State Drive
- HP 500-GB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive
- HP 1-TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

Part Number
- QV063AA
- QK554AA
- QK555AA

Optical Drives

- HP 16X SATA DVD-ROM JB Drive
- HP Blu-ray BDXL SATA Drive
- HP SATA SuperMulti JB Drive

Part Number
- AR629AA
- AR482AA
- QS208AA
## Input Devices

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT527A</td>
<td>HP PS/2 Standard Keyboard</td>
</tr>
<tr>
<td>DT528A</td>
<td>HP USB Standard Keyboard</td>
</tr>
<tr>
<td>B6B64AA</td>
<td>HP USB Grey Keyboard</td>
</tr>
<tr>
<td>RC465AA</td>
<td>HP USB Keyboard and Mouse Kit</td>
</tr>
<tr>
<td>VF097AA</td>
<td>HP USB Washable Keyboard</td>
</tr>
<tr>
<td>BM866AA</td>
<td>HP USB and PS/2 Washable Mouse</td>
</tr>
<tr>
<td>BU207AA</td>
<td>HP USB and PS/2 Washable Keyboard and Mouse Kit</td>
</tr>
<tr>
<td>QY449AA</td>
<td>HP Wireless Keyboard and Mouse</td>
</tr>
<tr>
<td>EY703AA</td>
<td>HP PS/2 Optical Mouse</td>
</tr>
<tr>
<td>DC172AT</td>
<td>HP USB Optical Mouse</td>
</tr>
<tr>
<td>GW405AT</td>
<td>HP USB Laser Mouse</td>
</tr>
<tr>
<td>AT485AA</td>
<td>HP Mouse Pad</td>
</tr>
</tbody>
</table>

## System Memory

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4U35AA</td>
<td>HP 2GB DDR3-1600 (PC3-12800) DIMM</td>
</tr>
<tr>
<td>B4U36AA</td>
<td>HP 4GB DDR3-1600 (PC3-12800) DIMM</td>
</tr>
<tr>
<td>B4U37AA</td>
<td>HP 8GB DDR3-1600 (PC3-12800) DIMM</td>
</tr>
</tbody>
</table>

## Multimedia Devices

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KK912AA</td>
<td>HP Thin USB Powered Speakers</td>
</tr>
<tr>
<td>QP896AA</td>
<td>HP USB HD 720P Business Webcam</td>
</tr>
<tr>
<td>QK550AA</td>
<td>HP Business Headset</td>
</tr>
</tbody>
</table>

## Removable Media Storage

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR941AA</td>
<td>HP 22-n-1 Media Card Reader</td>
</tr>
</tbody>
</table>

## Security Devices

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV606AA</td>
<td>HP Business PC Security Lock</td>
</tr>
<tr>
<td>VN570AA</td>
<td>HP SFF Wall Mount/Security Sleeve</td>
</tr>
<tr>
<td>AR639AA</td>
<td>HP Chassis Security Kit</td>
</tr>
<tr>
<td>BV411AA</td>
<td>HP Keyed Security Kit</td>
</tr>
</tbody>
</table>
## Stands and Accessories

<table>
<thead>
<tr>
<th>Part</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Integrated Work Center Stand (SFF)</td>
<td>QP897AA</td>
</tr>
<tr>
<td>HP SFF Tower Stand</td>
<td>VN569AA</td>
</tr>
<tr>
<td>HP Serial Port Adapter (RS-232 compatible)</td>
<td>PA716A</td>
</tr>
<tr>
<td>HP Parallel Port Adapter</td>
<td>KD061AA</td>
</tr>
<tr>
<td>Belkin USB to Serial Adapter</td>
<td>EM449AA</td>
</tr>
<tr>
<td>Belkin 7-Outlet Surge Protector</td>
<td>AG290AA</td>
</tr>
<tr>
<td>Belkin Cat5e Patch Cable</td>
<td>AH122AA</td>
</tr>
<tr>
<td>Belkin Firewire (1394) Cable</td>
<td>AH123AA</td>
</tr>
</tbody>
</table>

## Monitors

<table>
<thead>
<tr>
<th>Part</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP LV1911 18.5-inch LED Backlit LCD Monitor</td>
<td>A5V72AA</td>
</tr>
<tr>
<td>HP LV2011 20-inch LED Backlit LCD Monitor</td>
<td>A3R82AA</td>
</tr>
<tr>
<td>HP LV2311 23-inch LED Backlit LCD Monitor</td>
<td>A6B85AA</td>
</tr>
</tbody>
</table>

---

**Copyright © 2013 Hewlett-Packard Development Company, L.P.**

All rights reserved. Microsoft, Windows, Windows 7, and Windows Vista are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. Intel, Core 2 Quad, Core 2 Duo, Pentium and Celeron are registered trademarks or trademarks of Intel Corporation in the U.S. and/or other countries. Bluetooth is a registered trademark of Bluetooth SIG, Inc., in the U.S. and other countries. All other product names mentioned herein may be trademarks of their respective companies. The information contained herein is subject to change without notice and is provided "as is" without warranty of any kind. The warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.