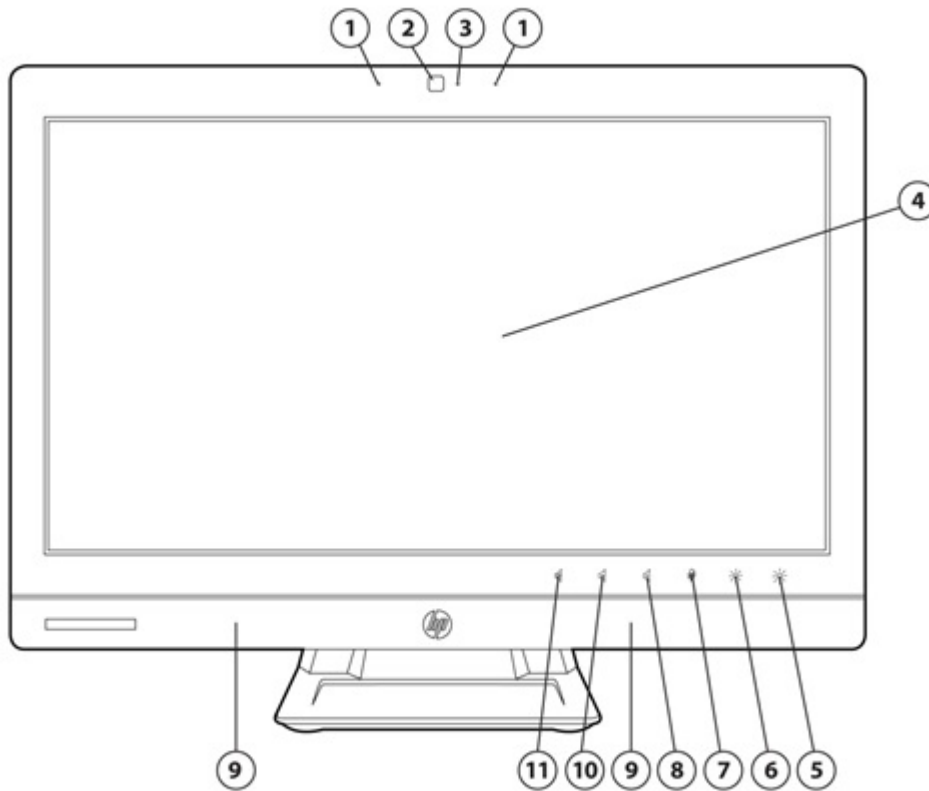


### Overview

### HP ProOne 600 G1 All-in-One Business PC (21.5" Non-Touch )

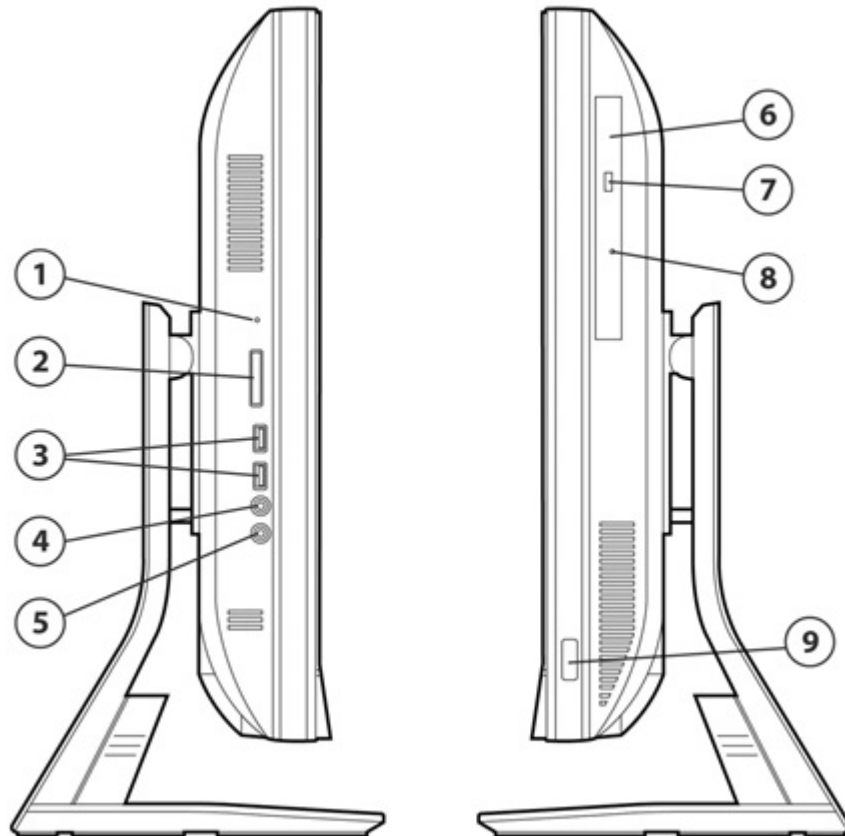


#### FRONT

1. Dual microphone array (only on models with Webcam)
2. 2.0 MP Webcam (optional)
3. Webcam Activity LED
4. 21.5-inch IPS Full HD capable screen
5. Increase brightness
6. Decrease brightness
7. Mute microphone
8. Increase volume
9. High performance stereo speakers
10. Reduce volume
11. Mute speaker

### Overview

### HP ProOne 600 G1 All-in-One Business PC

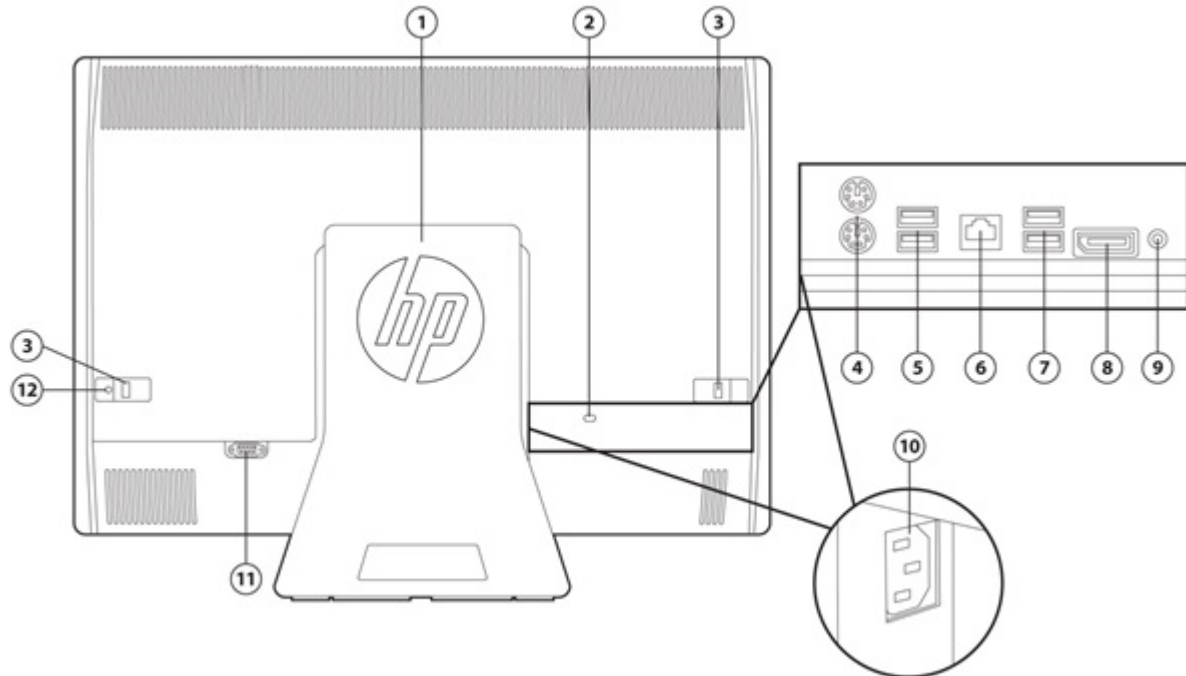


#### SIDE

1. Hard disc drive activity LED
2. HP SD media card reader (optional)
3. (2) USB 3.0 ports, including 1 fast charging port
4. Microphone/line in jack
5. Headphone/line out jack
6. Tray-load optical disc drive (optional)
7. Optical disc drive eject button
8. Optical disc drive activity LED
9. Power button

### Overview

### HP ProOne 600 G1 All-in-One Business PC



#### REAR/PORTS (BEHIND SECURITY COVER)

1. Stand (can be configured with no stand, basic stand, or height adjustable/reclining stand)
2. Security lock slot
3. Access panel latches
4. (2) PS/2 mouse and keyboard connectors
5. (2) USB 2.0 ports
6. RJ-45 Gigabit Ethernet port
7. (2) USB 3.0 ports
8. DisplayPort connector
9. Stereo audio line out
10. Power connector
11. Optional Serial Port

### Overview

#### At A Glance

- Windows 7 or Windows 8
- UEFI BIOS developed and engineered by HP for better security, manageability and software image stability
- Integrated All-in-One form factor
- 21.5-inch IPS Full HD (1920 x 1080) diagonal widescreen WLED backlit anti-glare LCD
- Landscape or portrait display orientation - with height adjustable stand or VESA mount
- Can be configured with no stand, basic stand, or height adjustable/reclining stand
- Intel® Q85 chipset
- Intel® 4th generation Core™ processors
- Supports processors up to 65W
- Integrated Intel® HD Graphics
- Optional MXM Discrete graphics
- Integrated Intel® I217LM Gigabit Network Connection
- Optional wireless connectivity:
  - Intel® Advanced-N 6205 WLAN
    - Intel® 802.11 a/b/g/n
  - Intel® Dual Band Wireless-N 7260
    - Intel 802.11 a/b/g/n
  - WLAN and Bluetooth Combo Card
    - HP 802.11 a/b/g/n
    - Bluetooth® 4.0
- WiDi support (with Intel® 6205 WLAN and Intel® HD Graphics)
- Optional Near Field Communication (NFC)
- Optional Integrated 2.0 MP Webcam & Dual Microphone Array
- High performance integrated stereo speakers
- DTS Sound +™ with optional DTS Studio Sound™
- Up to 16 GB of DDR3 SDRAM, dual channel memory support, two SODIMM slots
- Support for up to 3 storage drives (2 SATA, 1 mSATA)
- Up to 2 TB SATA Hard Drive, 256GB Self-Encrypting Solid State Drive, 500GB Self-encrypting Drive, 1TB Solid State Hybrid Drive
- Optional Slim Tray-load SuperMulti DVD Writer, DVD-ROM, or BDXL Blu-ray Writer Optical Disc Drive
- Optional SD Media Card Reader
- Optional serial port
- DisplayPort out
- Integrated VESA 100 x 100 mounting holes
- Lockable rear access panel with intrusion sensor
- ENERGY STAR® qualified. EPEAT® registered where applicable/supported. See [www.epeat.net](http://www.epeat.net) for registration status by country.
- CCC, CECP & SEPA Certified
- Optimized for Microsoft Lync
- TCO AiO and TCO Edge
- Low Halogen
- Arsenic Free
- Protected by HP Services, including warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)

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

### OPERATING SYSTEM

#### Preinstalled when purchased

Windows 8.1 Pro (64-bit)\*

Windows 8.1 (64-bit)\*

Windows 7 Professional (32-bit)\*\*

Windows 7 Professional (64-bit)\*\*

Windows 7 Professional (32-bit) (available through downgrade rights from Windows 8.1 Pro)\*\*\*

Windows 7 Professional (64-bit) (available through downgrade rights from Windows 8.1 Pro)\*\*\*

FreeDOS 2.0

Novell SUSE Linux Enterprise Desktop 11

\*Not all features are available in all editions of Windows 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 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 8.1 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.

### PROCESSORS

#### Intel® 4<sup>th</sup> Generation Core™ i7 Processors

Intel® Core™ i7-4790S

Up to 4.0 GHz Max. Turbo Frequency (3.2 GHz base frequency), 8 MB cache, 4 cores, 8 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

Intel® Stable Image Platform Program (SIPP)

Intel® Core™ i7-4770S

Up to 3.9 GHz Max. Turbo Frequency (3.1 GHz base frequency), 8 MB cache, 4 cores, 8 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

Intel's® Stable Image Platform Program (SIPP)

#### Intel® 4<sup>th</sup> Generation Core™ i5 Processors

Intel® Core™ i5-4690S

Up to 3.9 GHz Max. Turbo Frequency (3.2 GHz base frequency), 6 MB cache, 4 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

Intel® Stable Image Platform Program (SIPP)

Intel® Core™ i5-4670S

Up to 3.8 GHz Max. Turbo Frequency (3.1 GHz base frequency), 6 MB cache, 4 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

Intel's® Stable Image Platform Program (SIPP)

Intel® Core™ i5-4590S

Up to 3.7 GHz Max. Turbo Frequency (3.0 GHz base frequency), 6 MB cache, 4 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

Intel® Stable Image Platform Program (SIPP)

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

#### Intel® Core™ i5-4570S

Up to 3.6 GHz Max. Turbo Frequency (2.9 GHz base frequency), 6 MB cache, 4 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

Intel's® Stable Image Platform Program (SIPP)

#### Intel® Core™ i3-4160

3.6 GHz base frequency, 3 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4400

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Core™ i3-4370

3.8 GHz base frequency, 4 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Pentium™ G3250

3.2 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Pentium™ G3450

3.5 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

### **Intel® 4th Generation Core™ i3 Processors**

#### Intel® Core™ i3-4360

3.7 GHz base frequency, 4 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Core™ i3-4350

3.6 GHz base frequency, 4 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Core™ i3-4340

3.6 GHz base frequency, 4 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Core™ i3-4330

3.5 GHz base frequency, 4 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Core™ i3-4150

3.5 GHz base frequency, 3 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4400

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Core™ i3-4130

3.4 GHz base frequency, 3 MB cache, 2 cores, 4 threads

Intel® HD Graphics 4600

Supports DDR3 memory up to 1600 MT/s data rate

### **Intel® 4th Generation Pentium™ Processors**

#### Intel® Pentium™ G3450

3.4 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

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

#### Intel® Pentium™ G3440

3.3 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Pentium™ G3430

3.3 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Pentium™ G3420

3.2 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Pentium™ G3240

3.1 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

#### Intel® Pentium™ G3220

3.0 GHz base frequency, 3 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1300 MT/s data rate

#### **Intel® Celeron™ Processors**

##### Intel® Celeron™ G1850

2.9 GHz base frequency, 2 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

##### Intel® Celeron™ G1840

2.8 GHz base frequency, 2 MB cache, 2 cores, 2 threads

Intel® HD Graphics

Supports DDR3 memory up to 1600 MT/s data rate

## CHIPSET

Intel® 8 Series (Q85) Chipset

## INTEL® STANDARD MANAGEABILITY

Includes DASH 1.0/1.1 compliance plus:

- System Defense
- Agent Presence
- SOL/IDE Redirection
- CISCO NAC/SDN support
- ME Wake on LAN
- Host Based Configuration
- ME Firmware Rollback
- IPv6 Support

DASH 1.0/1.1 compliance:

- Boot Control
- HW Inventory
- SW Inventory
- Power State Management
- HW Alerting

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

### SMBIOS

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

### GRAPHICS

#### Integrated

Intel® HD Graphics 4600

Graphics controller	Intel® Processor Graphics
DisplayPort	Multi-Stream support (supports up to 2 external displays) <sup>3</sup>
Memory	Up to 1.8GB DDR3
Supported Graphics APIs	DX11.1, OpenGL 4.0, OpenCL 1.2, full 1080p Blu-Ray Disc (H264) playback in hardware

#### Discrete (optional)

AMD® Radeon HD 7650A 2GB DDR3 MXM Graphics

Graphics controller	AMD® Radeon HD 7650A
DisplayPort	Multi-Stream support (supports up to 4 external displays at 1920x1080) <sup>3</sup>
Core clock	600MHz max
Memory clock	800MHz max
Memory frame buffer	2GB, DDR3, 128-bit wide
Memory	2GB DDR3
Supported Graphics APIs	DX11, OpenGL 4.1, OpenCL 1.1, full 1080p Blu-Ray Disc (H264) playback in hardware

<sup>3</sup>Using the Integrated Graphics, two (2) external displays are supported via one of these methods:

Using the MXM Graphics, up to four (4) external displays are supported via one of these methods:

- 1) DisplayPort multi-stream monitors 'daisy-chained' together or
- 2) DisplayPort multi-stream hub - hub requires power through power cable provided. DisplayPort multi-stream hub provides 4 DisplayPort ports, adapters are required for support of DVI, VGA or HDMI displays.

### WIRELESS DISPLAY

WiDi support with Intel® Advanced-N 6205 WLAN or Dual Band Wireless-N 7260 (mini PCI Express) and Intel® HD graphics

#### Desktop system requirements for Intel® Wireless Display

System Component	Requirement
Processor	4th generation Intel® Core processor
Graphics	Intel® HD Graphics
Wireless	Intel Advanced-N 6205 WLAN
Software	Intel® My WiFi Technology and Intel® Wireless Display must be pre-installed and enabled.
OS*	Windows 7 32-bit/64-bit Home Premium, Ultimate, Professional; Windows 7 32-bit Home Basic

\* Windows 8 supports Wireless Display natively



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

### DISPLAY

21.5" diagonal IPS widescreen WLED backlit anti-glare LCD; Orientation designed to operate in portrait or landscape

<b>Display Panel</b>	Type	IPS WLED Backlit LCD
	Viewable image area (mm)	476.06 x 267.79
	Screen opening (mm)	477.73 x 269.22
	Native Resolution (HxV)	1920 x 1080
	Aspect ratio	16:9
	Pixel pitch (HxV)(mm)	0.248 x 0.248
	Contrast ratio (typical)	1000:1
	Brightness (typical)	250nits (cd/m <sup>2</sup> )
	Viewing angle (typical) (HxV)	178 ° x 178 °
	Backlight lamp life (to half brightness)	30,000 hours minimum
	Color support	Over 16 million colors
	Color gamut (typical)	72%
	Anti-glare	Yes
	Default color temperature	Warm (6500K)

**NOTE:** All performance specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

<b>Basic Stand:</b>	Tilt Angle	-5° to +30°
	Rotation	360° swivel
<b>Height Adjustable /Reclining Stand:</b>	Vertical Adjustment	Up to 110 mm
	Recline Angle	Low position sliding height adjustment => -5° to +60°
	Tilt Angle	High position sliding height adjustment => -5° to +30°
	Rotation	360° swivel and portrait or landscape orientation

### WEBCAM & MIC

Optional integrated 2.0 MP webcam & dual microphone array; maximum resolution of 1920 x 1080

### STORAGE

#### 3.5" SATA Hard Drive

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

#### 2.5" SATA Hard Drive

320 GB, 7200 rpm, SATA 6.0 Gb/s, SMART IV  
 500 GB, 7200 rpm, SATA 6.0 Gb/s, SMART IV

#### 2.5" Solid State Drive

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

#### 2.5" Self-Encrypting Solid State Drive

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

128 GB, SATA, Self-Encrypting Solid State Drive  
256 GB, SATA, Self-Encrypting Solid State Drive

#### **2.5" Self-Encrypting Drive**

500 GB, SATA, Self-Encrypting Drive

#### **2.5" Solid State Hybrid Drive**

500 GB, SATA, Solid State Hybrid Drive  
1 TB SATA, Solid State Hybrid Drive

#### **Optical Disc Drive**

Slim Tray-load SATA DVD-ROM  
Slim Tray-load SATA SuperMulti DVD Writer  
Slim Tray-load SATA BDXL Blu-ray Writer  
No included Optical Disc Drive

#### **Removable**

HP Slim Removable SATA HDD frame/carrier

#### **Media Card Reader** (optional)

5-in-1 PCIe Interface  
Supports Secure Digital (SD, SDXC, SDHC, UHS-I, UHS-II)

## MEMORY

#### **Type**

Non-ECC, DDR3 SDRAM, 1600 MT/s, SODIMM

#### **Maximum**

16 GB

#### **# of Slots**

2  
204-pin supporting dual-channel memory  
Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

**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.

Memory modules support data transfer rates up to 1600 MT/s; actual data rate is determined by the system's configured processor. See processor specifications for supported memory data rate.

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

### NETWORKING/COMMUNICATIONS

#### Ethernet (RJ-45)

Integrated Intel® I217LM Gigabit Network Connection

**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 LAN (optional)

Intel® 802.11 a/b/g/n wireless 6205 PCIe minicard  
Up to 300 mbps data rate

Intel® 802.11 a/b/g/n wireless 7260 PCIe minicard over here  
Up to 300 mbps data rate

HP 802.11 a/b/g/n wireless PCIe minicard with Bluetooth Combo  
Up to 300 mbps data rate  
Bluetooth 4.0 compliant  
Works with a wide range of Bluetooth devices

Intel 7260 802.11 a/b/g/n MCard BT NIC

#### Near Field Communications (NFC) (optional)

HP Module with NXP NFC Controller with Embedded Secure Element, PN650  
Supports Windows 8, Proximity Events  
Support Windows 7, PC/SC  
NFC Forum Compliant

### AUDIO/MULTIMEDIA

DTS Sound +™

DTS Studio Sound™ (optional)

Realtek ALC 3228 Audio – 16 & 24-bit PCM

High performance integrated stereo speakers

Volume control and mute buttons

Stereo headphone jack

Microphone in

Stereo line out

Integrated 2.0 MP webcam (up to 30 frames/sec) & dual microphone array (optional)

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

### KEYBOARDS AND POINTING DEVICES

#### Keyboard

HP PS/2	104 keys plus special functions for Mute, Volume Up, Volume Down, Sleep Separate numeric keypad Cable length 70.87 in (180 cm)
HP USB	104 keys plus special functions for Mute, Volume Up, Volume Down, Sleep Separate numeric keypad Cable length 51 in (130 cm)
HP Wireless Keyboard & Mouse	104 keys plus special functions for Mute, Volume Up, Volume Down, Sleep Separate numeric keypad; two buttons with scroll wheel acting as third button Operates at ~ 2.4 GHz and supports a working distance of up to 32 ft (10m) Cable length 6ft (1.8m) (Keyboard contains 25% post-consumer recycled plastic material)
HP USB SmartCard CCID Keyboard	104, 105, 106, 107, 109 layout (depending upon country) All ISO 7816 smart cards
HP USB PS/2 Washable Keyboard	SpillSeal® keyboard technology protection USB & PS/2 support in one solution Separate numeric keypad Cable length 7ft (2.2m)

#### Mice

HP PS/2 Mouse	800 dpi support Two buttons with scroll wheel 72.8 in (185 cm)
HP USB Optical Mouse	800 dpi support Two buttons with scroll wheel 72.8 in (185 cm)
HP USB 1000dpi Laser Mouse	1000 dpi support Two buttons with scroll wheel Cable length 70.8 in (180 cm)
HP USB PS/2 Washable Scroll Mouse	SpillSeal® mouse technology protection Two buttons with scroll wheel 8.8 ft total 70 cm+ 2m extension

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

#### HP BIOSphere

Key features of the HP BIOS include:

- Deployment and manageability - HP BIOS provides several technologies that help integrate the HP ProOne 600 Business PC into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Stability - HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Support UEFI specification 2.3.1
- Thermal and power management - The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Business Desktop computer in any enterprise environment.
- Thermal Controlled Fans - Automatic or manual controlled fan speeds for cooling and acoustic performance Serviceability - HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery - HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (DOSFlash), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery (Emergency Boot Block Recovery). In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS F10 setup and from the support website.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery.
- Serviceability - HP BIOS provides diagnostic and detailed service information.

#### Additional HP BIOS Features

- Power-On password - Helps prevent an unauthorized user from powering on the system.
- Administrator password - Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) - Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP Pro models use ACPI to provide power conservation features.
- S5 Max Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 1W in S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.\
- Master Boot Record Security - Helps to prevent changes and/or infections to the Master Boot Record caused by viruses or malicious code
- HP BIOS Protection - prevents unauthorized updates or changes to the BIOS due to malware, viruses, or malicious BIOS updates. Based on NIST SP800-147 policy guidelines.

#### SECURITY

USB port disable  
Lockable Access Panel  
Lockable I/O security cover  
Security Screw  
HP Keyed Cable Lock (optional)  
Common Criteria Certified, Infineon TPM SLB9656TT1.2- 4.32 FW  
Intrusion Detector  
Wall/Arm/Cart Mountable via VESA bracket  
Support for Nobel Locking Plate (3<sup>rd</sup> party option)  
Support for 3M Privacy Screen (3<sup>rd</sup> party option)

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

### POWER

Internal 180W, up to 91% efficient, active PFC  
100-240V AC

Loading	20%		50%		100%	
Power Efficiency	87%	87%	91%	90%	90%	87%
Volts	230	100/115	230	100/115	230	100/115

### SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

Included	Windows 7	Windows 8.1
<b>Security</b>	Absolute Persistence(status tracing) <sup>1</sup> Device Access Manager Drive Encryption <sup>4</sup> File Sanitizer (Activated via Wizard) Disk Sanitizer (external version) <sup>2</sup> Microsoft Security Essentials HP Client Security	Absolute Persistence(status tracing) <sup>1</sup> Device Access Manager Drive Encryption <sup>4</sup> File Sanitizer (Activated via Wizard) Disk Sanitizer (external version) <sup>2</sup> Microsoft Defender Secure Erase HP Client Security
<b>Multimedia</b>	Cyberlink Power DVD, BD Cyberlink Power2Go (Secure Burn)	Cyberlink Power DVD, BD Cyberlink Power2Go (Secure Burn)
<b>Communication</b>		HP Wireless Hotspot
<b>HP Value Add</b>	HP ePrint Driver <sup>3</sup> HP PageLift HP Support Assistant HP Recovery Disk Creator	HP ePrint Driver <sup>3</sup> HP PageLift HP Recovery Manager HP Support Assistant HP QuickStart
<b>3rd Party</b>	Adobe Flash Player Bing Search for Internet Explorer 10 Box Foxit PhantomPDF Express for HP Skype	Bing Search Foxit PhantomPDF Express for HP Skype
<b>Microsoft Products</b>	Buy Office	Buy Office

<sup>1</sup>Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription. Subscription can be purchased for terms ranging from one to five years. Service is limited, check with Absolute for availability outside the U.S.

<sup>2</sup>Available via download

<sup>3</sup>Preinstalled on models with webcam

<sup>4</sup>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](http://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.

<sup>5</sup>UK only

<sup>6</sup> Drive Encryption is planned to be available in October 2013. Requires Windows. Data is protected prior to Drive Encryption login. Turning the PC off or into hibernate logs out of Drive Encryption and prevents data access.

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

### ENVIRONMENTAL & INDUSTRY

ENERGY STAR® qualified models available

EPEAT® registered where applicable/supported. See [www.epeat.net](http://www.epeat.net) for registration status by country.

Industry standard certifications:

- UL
- CSA
- FCC compliance
- ENERGY STAR®
- EPEAT® Gold
- EUP Lot6 Tier2
- CCC
- CECP
- SEPA
- TCO AiO and TCO Edge
- Optimized for Microsoft Lync
- Low halogen
- Arsenic Free
- 80 PLUS®
- TAA compliant

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

### WEIGHTS & DIMENSIONS

#### Weight

<i>Product Weight</i> <i>Unboxed</i>	<u>Without stand</u>	<u>Basic stand</u>	<u>Height adjustable/reclining stand</u>
	14.6 - 17.4 lbs 6.63 - 7.88 kg	19.4 - 22.2 lbs 8.8 - 10.05 kg	28.8 - 31.5 lbs 13.06 - 14.31 kg
<i>Shipping Weight</i> <i>Boxed</i>	<u>Without stand</u>	<u>Basic stand</u>	<u>Height adjustable/reclining stand</u>
	26.24 lbs 11.90 kg	31.09 lbs 12.87 kg	40.92 lbs 17.84 kg
<i>Shipping Weight</i> <i>Pallet</i>	<u>Without stand (18 units)</u>	<u>Basic stand (18 units)</u>	<u>Height adjustable/reclining stand (12 units)</u>
	503.80 lbs 228.48 kg	595.35 lbs 250.66 kg	491.10 lbs 233.08.84 kg

#### Dimensions (W x D x H)

<i>Product Dimensions</i>	<u>Without stand</u>	<u>Basic stand</u>	<u>Height adjustable/reclining stand 0 degrees</u>
	20.5 x 2.56 x 14.5 in 521.9 x 65 x 367.4 mm	20.5 x 7.7 x 16.8 in 521.9 x 195.6 x 426.8 mm	20.5 x 9.8 x 20.4 in 521.9 x 247.7 x 518.5 mm
			<u>Height adjustable/reclining stand 60 degrees</u>
			20.5 x 14.4 x 10.8 in 521.9 x 366.8 x 273.1 mm

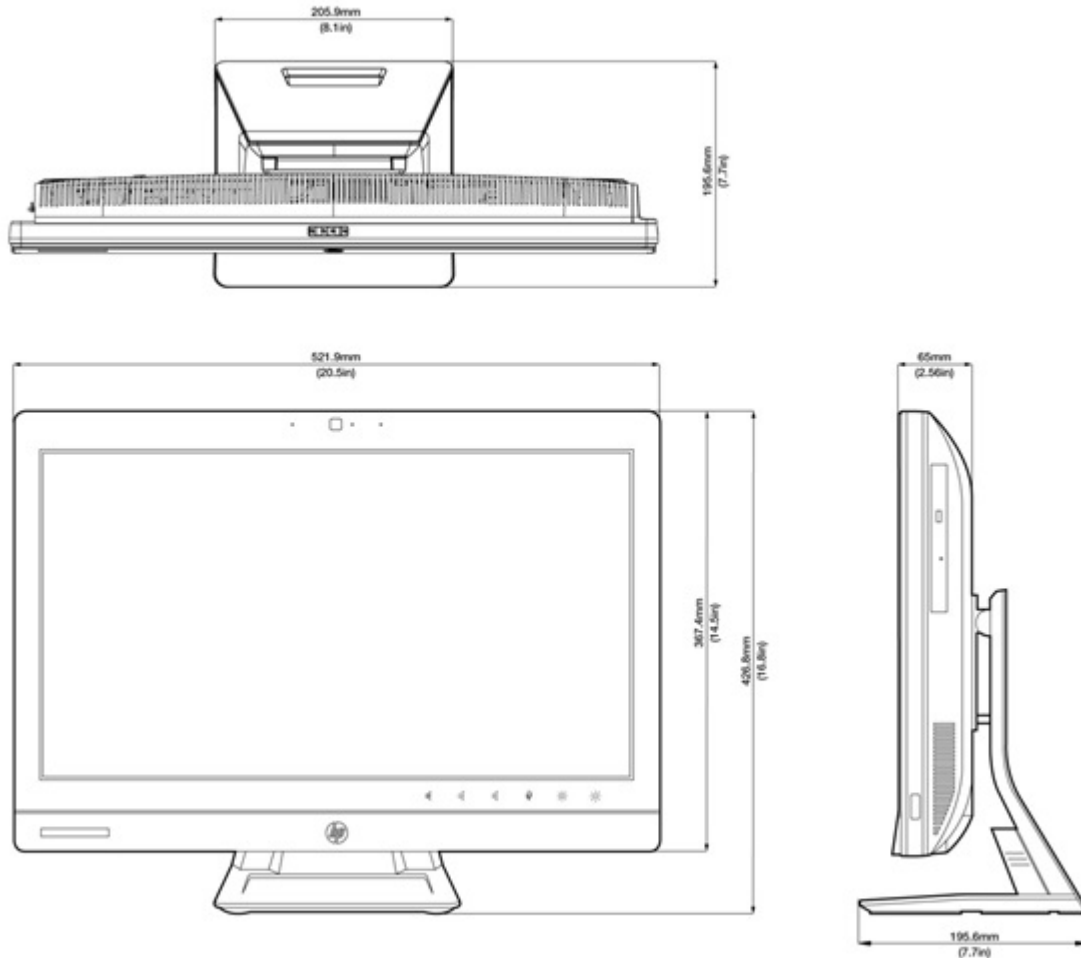
#### Shipping Dimensions

<i>Shipping Dimensions</i> <i>Boxed</i>	<u>Without stand</u>	<u>Basic stand</u>	<u>Height adjustable/reclining stand</u>
	24.41 x 11.22 x 22.44 in 620 x 285 x 570 mm	24.41 x 11.22 x 22.44 in 620 x 285 x 570 mm	29.06 x 12.87 x 23.19 in 738 x 327 x 589 mm

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

<i>Shipping Dimensions</i>	<u>Without stand (18 units)</u>	<u>Basic stand (18 units)</u>	<u>Height adjustable/reclining stand (12 units)</u>
<i>Pallet</i>	47.24 x 39.37 x 72.05 in 1200 x 1000 x 1830 mm	47.24 x 39.37 x 72.05 in 1200 x 1000 x 1830 mm	47.24 x 39.37 x 74.29 in 1200 x 1000 x 1887 mm

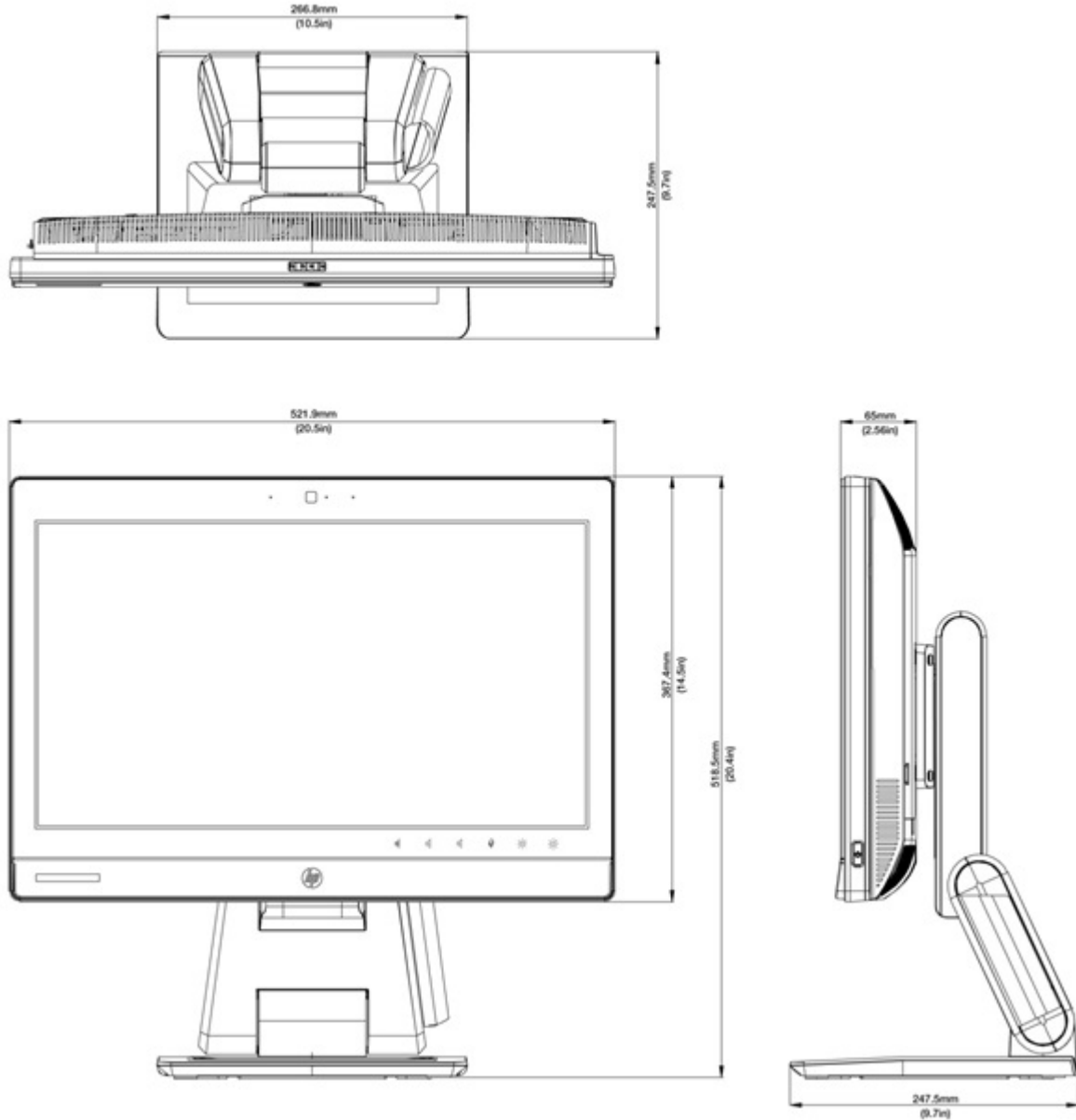
### BASIC STAND DIMENSIONS





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

### HEIGHT ADJUSTABLE/RECLINING STAND DIMENSIONS



### TEMPERATURE, HUMIDITY, ALTITUDE

<b>Temperature</b>	Operating	50° to 95° F (10° to 35° C)*
	Non-operating	-22° to 140° F (-30° to 60° C)
<b>Relative humidity</b>	Operating	10% to 90% (non-condensing at ambient)
	Non-operating	5% to 95% (non-condensing at ambient)
<b>Altitude</b> (unpressurized)	Operating	10,000 ft (3048 m)
	Non-operating	30,000 ft (9144 m)

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

### PORTS

#### I/O Ports - Standard

4 - USB 3.0 (2 side including 1 fast charging, 2 rear)

USB Fast Charging Port:

- Up to 2.5A charging current (5 times the maximum current supported by a USB 2.0 port)
- D+/D- CDP/DCP Modes per USB Battery Charging Specification 1.2
- D+/D- Shorted Mode per Chinese Telecommunication Industry Standard YD/T 1591-2009
- Supports non-BC1.2 Charging Modes by Automatic Selection
- D+/D- Divider Modes 2.0V/2.7V and 2.7/2.0V
- D+/D- 1.2V Mode
- Supports Sleep-Mode Charging
- Automatic SDP/CDP Switching for Devices That do not Connect to CDP Ports

2 - USB 2.0 (2 rear)

2 - PS/2 (legacy) (one keyboard, one mouse)

1 - Microphone in (side)

1 - Headphone jack (side)

1 - Serial RS-232 (rear) (optional)

1 - Stereo audio line out (rear)

1 - Power connector (rear)

1 - RJ-45 (rear)

1 - DisplayPort with multi-stream<sup>6</sup>

DisplayPort connector supports multimode technology to support connection to DVI-D, HDMI and VGA monitors with optional adapters or to a DisplayPort monitor with a DisplayPort Cable.

DisplayPort Cable	Provides a direct connection between the PC's DisplayPort interface to the display's DisplayPort interface
DisplayPort To DVI-D Adapter	Provides a connection from the PC's DisplayPort interface to the display's DVI-D interface; adapts the DP output to the DVI-D input
DisplayPort To HDMI Adapter	Provides a connection from the PC's DisplayPort interface to the display's HDMI interface; adapts the DP output to the HDMI input
DisplayPort To VGA Adapter	Provides a connection from the PC's DisplayPort interface to the display's analog VGA interface; adapts the digital DP output to the analog VGA input

<sup>6</sup>Using the Integrated Graphics, two (2) external displays are supported via one of these methods:

Using the MXM Graphics, up to four (4) external displays are supported via one of these methods:

- 1) DisplayPort multi-stream monitors 'daisy-chained' together or
- 2) DisplayPort multi-stream hub - hub requires power through power cable provided. DisplayPort multi-stream hub provides 4 DisplayPort ports, adapters are required for support of DVI, VGA or HDMI displays.

### SLOTS

1 - Mini PCIe half-length (used by wireless LAN module)

1 - MXM 3.0 Type A - 35W

1 - mSATA

### BAYS

1 - 3.5" internal; Supports One - 3.5" hard drive or up to Two - 2.5" hard drives (HDD/SSD/SED/SSHD)

1 - 5.25" external; Slim Line Optical Drive

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

### SERVICE AND SUPPORT

On-site Warranty<sup>1</sup>: Three-year (3-3-3) limited warranty delivers three years of on-site, next business day<sup>2</sup> service for parts and labor and includes free telephone support<sup>3</sup> 24 x 7. Three-year onsite and labor are not available in all countries. Service offers terms up to 5 years by choosing a Care Pack. To choose the right level of service for your HP product, visit HP Care Pack Central: [www.hp.com/go/cpc](http://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.

### Technical Specifications - Graphics

#### Intel HD Graphics

<b>VGA Controller</b>	Integrated
<b>DisplayPort</b>	Multimode capable; supports HDCP, Display Port Audio (2 streams), HBR2 link rates and Multi-Stream Technology for a maximum of 3 displays (including the integrated panel)
<b>Bus Type</b>	N/A
<b>RAMDAC</b>	N/A
<b>Memory</b>	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.

<b>Maximum Graphics Memory</b>	Microsoft Windows 7	Windows 8
	Up to 1.7GB	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.

<b>Maximum Color Depth</b>	32 bits/pixel
<b>Graphics/Video API Support</b>	4th 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
- DirectX Video Acceleration (DXVA) support for accelerating video processing
  - Full AVC/VC1/MPEG2 HW Decode
- Advanced Scheduler 2.0, 1.0
- Windows 7, Windows 8, Linux OS Support
- DirectX 11.1
- OpenGL 4.0
- Open CL 1.2

#### 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

Resolution	Refresh Rates
800x600	60 Hz
1024x768	60 Hz
1152x864	60 Hz
1280x600	60 Hz
1280x720	60 Hz
1280x800	60 Hz
1280x960	60 Hz
1280x1024	60 Hz
1360x768	60 Hz
1366x768	60 Hz
1400x1050	60 Hz
1440x900	60 Hz

### Technical Specifications - Graphics

1600x900	60 Hz
1600x1200*	60 Hz
1680x1050	60 Hz
1920x1080	60 Hz
1920x1200*	60 Hz
1920x1440*	60 Hz
2560x1440*	60 Hz
2560x1600*	60 Hz

\* Only supported on displays connected to the external DisplayPort connector.

### AMD Radeon HD 7650A Graphics Card

<b>Form Factor</b>	MXM 3.0
<b>Graphics Controller</b>	AMD Radeon HD 7650A
<b>DisplayPort</b>	Multi-Stream Technology for a maximum of 5 displays (including the integrated panel)
<b>Core Clock</b>	600MHz
<b>Memory Clock</b>	800MHz
<b>Memory</b>	2GB, DDR3, 128-bit wide
<b>Bus Type</b>	MXM
<b>Max. Power</b>	35W
<b>Power Source Support</b>	12V and 19V
<b>3D API Support</b>	DX11, SMS
<b>HDCP Support</b>	Yes
<b>Display Max. Resolution</b>	Digital 2560 x 1600 Analog 2048 x 1536
<b>Supported Graphics APIs</b>	DX11, OpenGL, full 1080p BD (H264) playback in hardware, Multi-Stream DisplayPort 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

Resolution	Refresh Rates
800 x 600	60 Hz
1024 x 768	60 Hz
1280 x 720	60 Hz
1280 x 768	60 Hz
1280 x 1024	60 Hz
1360 x 768	60 Hz
1440 x 900	60 Hz
1600 x 900	60 Hz
1680 x 1050	60 Hz
1920 x 1080	60 Hz

### Technical Specifications – Hard Disk and Solid State Storage

#### 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 Pro 600 Series supports the latest SATA 6.0Gb/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 prompted 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

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

<b>Capacity</b>	500,107,862,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	SATA 6 Gb/s	
<b>Buffer Size</b>	16 MB	
<b>Logical Blocks</b>	976,773,168	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	Single Track:	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
<b>Height</b> (nominal)	1 in/2.54 cm	
<b>Width</b> (nominal)	Media diameter:	3.5 in/8.89 cm
	Physical size:	4 in/10.2 cm
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### HP 1-TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

<b>Capacity</b>	1,000,204,886,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	SATA 6 Gb/s	
<b>Buffer Size</b>	32 MB	
<b>Logical Blocks</b>	1,953,525,168	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	Single Track:	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
<b>Height</b> (nominal)	1 in/2.54 cm	
<b>Width</b> (nominal)	Media diameter:	3.5 in/8.89 cm
	Physical size:	4 in/10.2 cm
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### HP 2-TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

<b>Capacity</b>	2 TB	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	SATA 6 Gb/s	
<b>Cache, Multisegmented (MB)</b>	64 MB	
<b>Seek Time</b> (average)	Read	<8.5 ms
	Write	<9.5 ms
<b>Height</b>	1.028 in/26.11 mm	
<b>Width</b>	4.0 in/101.6 mm	
<b>Depth</b>	5.787 in/146.99 mm	
<b>Weight</b>	1.38 lb/626 g	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

### Technical Specifications – Hard Disk and Solid State Storage

#### HP 320-GB 7.2K SATA 6.0Gb/s 2.5" Hard Disk Drive

<b>Capacity</b>	320,072,933,376 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	SATA 6 Gb/s	
<b>Buffer Size</b>	16 MB	
<b>Logical Blocks</b>	488,397,168	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	Single Track:	2.0 ms
	Average:	12 ms
	Full-Stroke:	22 ms
<b>Height</b> (nominal)	0.374 in/9.5 mm	
<b>Width</b> (nominal)	Media diameter:	2.5 in/63.5 mm
	Physical size:	2.75 in/70 mm
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### HP 500-GB 7.2K SATA 6.0Gb/s 2.5" Hard Disk Drive

<b>Capacity</b>	500,107,862,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Interface</b>	SATA 6 Gb/s	
<b>Buffer Size</b>	16 MB	
<b>Logical Blocks</b>	976,773,168	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	Single Track:	2.0 ms
	Average:	12 ms
	Full-Stroke:	25 ms
<b>Height</b> (nominal)	0.374 in/9.5 mm	
<b>Width</b> (nominal)	Media diameter:	2.5 in/63.5 mm
	Physical size:	2.75 in/70 mm
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	

#### HP 120-GB Solid State Drive

<b>Unformatted Capacity</b>	120 GB	
<b>Architecture</b>	Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller	
<b>Interface</b>	SATA 3 Gb/s	
<b>Dimensions</b> (W x H x D)	2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm)	
<b>Weight</b>	0.18 lb (80 g)	
<b>Bandwidth Performance</b>	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
<b>Latency</b>	Read:	65-ms
	Write:	85-ms
<b>Power</b>	DC power requirement:	5 VDC 5%-100 mV ripple p-p
	Total power consumption:	0.15W (active); 0.075W (idle)
<b>Useful Drive Life</b>	35TB written, up to 20GB/day for 5 years	



### Technical Specifications – Hard Disk and Solid State Storage

<b>Environmental</b> (all conditions, non-condensing)	Operating Temperature:	32° to 158° F (0° to 70° C)
	Relative Humidity:	5% to 95%
	Maximum Wet Bulb Temperature (operating):	84° F (29° C)
	Shock:	1,500 G/0.5-ms

### HP 128 GB Solid State Drive

<b>Unformatted Capacity</b>	128 GB*	
<b>Architecture</b>	Multi Level Cell (MLC) NAND	
<b>Interface</b>	SATA 6 GB/sec	
<b>Dimensions (W x H x D)</b>	2.75 x 0.276 x 3.96 in (6.985 x 0.7 x 10.05 cm)	
<b>Weight</b>	0.16 lb (73 g)	
<b>Bandwidth Performance</b>	Sustained Sequential Read:	Up to 450 MB/s
	Sustained Sequential Write:	Up to 260 MB/s
	Random Read:	up to 46K IOPs
	Random Write:	up to 56K IOPs
<b>Latency</b>	Read:	55ms (TYP)
	Write:	55ms (TYP)
<b>Power</b>	DC power requirement:	Min 4.5 V; Max 5.5 V
	Total power consumption:	160 mW (Active) ; <85 mW; (Idle)
<b>Useful Drive Life</b>	1.2 million device hours**	
<b>Environmental</b> (all conditions, non-condensing)	Operating Temperature:	32° to 158° F (0° to 70° C)
	Relative Humidity:	5% to 95%
	Maximum Wet Bulb Temperature (operating):	84° F (29° C)
	Shock:	1,500 G/1.0 msec
<b>Regulations</b>	UL, CSA, EN 60950-2000, CISPR Pub 22 Class B, CNS 13438, AS/NZS CISPR 22:2002 Class B, Korea KCC, CE Mark	

\* For solid state disk drives, GB means 1 billion bytes. 128GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity will vary by content

\*\* The product achieves a mean time between failure (MTBF) based on population statistics not relevant to individual units.

### Technical Specifications – Hard Disk and Solid State Storage

#### HP 256 GB SATA 2.5" Self-Encrypting (SED) Solid State Drive

<b>Unformatted Capacity</b>	256,186,209,271 bytes	
<b>Architecture</b>	Self-Encrypting (SED) Solid State Drive with 25nm MLC NAND Flash and SATA interface	
<b>Interface</b>	SATA 6 Gb/s	
<b>NAND Flash</b>	25nm MLC NAND Flash	
<b>Height</b>	.275 in/7mm	
<b>Width</b>	2.75 in/69.85 mm	
<b>Length</b>	3.95 in/100.5 mm	
<b>Weight</b>	0.161 lb (73 g)	
<b>Bandwidth Performance</b>	Sustained Sequential 128k Read: Up to 450 MB/s	
	Sustained Sequential 128k Write: Up to 260 MB/s	
	Random 4k Read:	Up to 46K IOPs
	Random 4k Write:	Up to 56K IOPs
<b>Latency</b>	Read:	55 $\mu$ s
	Write:	55 $\mu$ s
<b>Power</b>	SATA power consumption:	160 mW (active average); <85 mW (idle average)
<b>Useful Drive Life</b>	72TB written, up to 40GB/day for 5 years	
<b>Environmental</b> (all conditions, non-condensing)	Operating Temperature:	32° to 158° F (0° to 70° C)
	Relative Humidity:	5% to 95%
	Shock:	1,500 G/1 ms

#### HP 500-GB 7200 RPM SATA 2.5" Self-Encrypting (SED) Hard Disk Drive\*

\*2.5" SED HDD with a bracket that allows it to be used in a 3.5" drive bay

<b>Capacity</b>	500,107,862,016 bytes	
<b>Rotational Speed</b>	7,200 rpm	
<b>Drive Type</b>	Self-Encrypting Drive (SED) with SATA interface	
<b>Interface</b>	SATA 6 Gb/s	
<b>Segmented Buffer with write cache</b>	32768 KB - A portion of buffer capacity used for firmware	
<b>Number of Sectors</b>	976,773,168	
	Single Track:	1.0 ms
	Average:	13 ms
<b>Seek Time</b> (typical reads)	Full-Stroke:	25 ms
<b>Media Diameter</b>	2.5 in/63.5 mm	
<b>Height</b>	0.267 in/6.8 mm, $\pm$ 0.2mm	
<b>Width</b>	2.75 in/69.85 mm, $\pm$ 0.25mm	
<b>Length</b>	3.945 in/100.2 mm, $\pm$ 0.25mm	
<b>Weight</b>	3.35 oz/95 g (max)	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

### Technical Specifications – Hard Disk and Solid State Storage

#### HP 500 GB SATA 6G 2.5" 8GB Solid State Hybrid Drive (SSHD)

<b>Formatted Capacity</b>	500 GB
<b>Spindle Speed</b>	5,400 rpm +/- 0.2%
<b>Drive Type</b>	Solid State Hybrid Drive (SSHD) technology with NAND Flash
<b>Interface</b>	SATA 6 Gb/s
<b>Cache Buffer</b>	64 MB
<b>NAND Flash</b>	8 GB
<b>Commercial Multilevel Cell (cMLC)</b>	
<b>Number of Sectors</b>	976,773,168
<b>Seek Time</b> (typical reads)	Single Track: 2.0 ms Average: 12 ms
<b>Height</b>	0.268 +/- .008 in (6.8 +/- 0.2 mm)
<b>Width</b>	2.750 +/- 0.010 in (69.85 +/- 0.25 mm)
<b>Length</b>	3.951 +0.008 / -0.010 in (100.35 +0.20 / -0.25 mm)
<b>Weight</b>	0.209 lb/95 g (max)
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)

#### HP 1-TB SATA 6G 2.5" 8GB Solid State Hybrid Drive (SSHD)

<b>Formatted Capacity</b>	1 TB
<b>Spindle Speed</b>	5,400 rpm +/- 0.2%
<b>Drive Type</b>	Solid State Hybrid Drive (SSHD) technology with NAND Flash
<b>Interface</b>	SATA 6 Gb/s
<b>Cache Buffer</b>	64 MB
<b>NAND Flash</b>	8 GB
<b>Commercial Multilevel Cell (cMLC)</b>	
<b>Number of Sectors</b>	976,773,168
<b>Seek Time</b> (typical reads)	Single Track: 2.0 ms Average: 12 ms
<b>Height</b>	0.374 +/- .008 in (9.5 +/- 0.2 mm)
<b>Width</b>	2.750 +/- 0.010 in (69.85 +/- 0.25 mm)
<b>Length</b>	3.951 +0.008 / -0.010 in (100.35 +0.20 / -0.25 mm)
<b>Weight</b>	0.254 lb/115 g (max)
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)

### Technical Specifications - Removable Storage

#### HP Slim SuperMulti DVD Writer Drive

<b>Height</b>	12.7mm height	
<b>Orientation</b>	Either horizontal or vertical	
<b>Interface type</b>	SATA/ATAPI	
<b>Disc recording capacity</b>	Up to 8.5 GB DL or 4.7 GB standard	
<b>Dimensions (W x H x D)</b>	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)	
<b>Weight (max)</b>	0.42 lb (190 g)	
	DVD-RAM	Up to 5X
	DVD-R DL	Up to 6X
	DVD+R	Up to 8X
	DVD+RW	Up to 8X
<b>Write speeds</b>	DVD+R DL	Up to 6X
	DVD-R	Up to 8X
	DVD-RW	Up to 6X
	CD-R	Up to 24X
	CD-RW	Up to 24X
	DVD-RAM	Up to 5X
	DVD-RW, DVD+RW	Up to 8X
	DVD-R DL, DVD+R DL	Up to 8X
<b>Read speeds</b>	DVD+R, DVD-R	Up to 8X
	DVD-ROM DL, DVD-ROM	Up to 8X
	CD-ROM, CD-R	Up to 24X
	CD-RW	Up to 24X
<b>Access time</b> (typical reads, including settling)	Random	DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical)
	Full Stroke	DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical)
	Stop Time	6 seconds typical
<b>Power</b>	Source	Slimline SATA DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)
	Temperature	41° to 122° F (5° to 50° C)
<b>Environmental conditions</b> (operating - non-condensing)	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	84° F (29° C)

#### HP Slim Blu-ray BDXL Drive

### Technical Specifications - Removable Storage

<b>Height</b>	12.7mm height		
<b>Orientation</b>	Either horizontal or vertical		
<b>Interface type</b>	SATA/ATAPI		
<b>Disc recording capacity</b>	Up to 128 GB QL, 100 GB TL, 50 GB DL or 25 GB standard SL		
<b>Dimensions (W x H x D)</b>	5.04 x 0.5 x 5.0 in (128 x 12.7 x 127 mm) without bezel		
<b>Weight (max)</b>	Up to 0.37 lb (170 g) without bezel		
<b>Write speeds</b>		<b>Triple-layer</b>	<b>Quadruple-layer</b>
	BD-R	Up to 4X	Up to 4X
	BD-RE	Up to 2X	Not supported
		<b>Single-layer</b>	<b>Double-layer</b>
	BD-R	Up to 6X	Up to 6X
	BD-RE	Up to 2X	Up to 2X
	DVD-R	Up to 8X	Up to 6X
	DVD-RW	Up to 6X	Not supported
	DVD+R	Up to 8X	Up to 6X
	DVD+RW	Up to 8X	Not supported
	DVD-RAM	Up to 5X	N/A
	CD-R	Up to 24X	N/A
	CD-RW	Up to 24X	N/A
		<b>Triple-layer</b>	<b>Quadruple-layer</b>
	BD-R	Up to 4X	Up to 4X
	BD-RE	Up to 4X	Not supported
	<b>Single-layer</b>	<b>Double-layer</b>	
BD-ROM	Up to 6X	Up to 6X	
BD-R	Up to 6X	Up to 6X	
BD-RE	Up to 6X	Up to 6X	
DVD-ROM	Up to 8X	Up to 8X	
DVD-R	Up to 8X	Up to 8X	
DVD-RW	Up to 8X	N/A	
DVD+R	Up to 8X	Up to 8X	
DVD+RW	Up to 8X	N/A	
BDMV (AACs Compliant Disc)	Up to 6X/2X (Read/Play)	N/A	
DVD-RAM	Up to 5X	N/A	
<b>Read speeds</b>		<b>Triple-layer</b>	<b>Quadruple-layer</b>
	BD-R	Up to 4X	Up to 4X
	BD-RE	Up to 2X	Not supported
		<b>Single-layer</b>	<b>Double-layer</b>
	BD-ROM	Up to 6X	Up to 6X
	BD-R	Up to 6X	Up to 6X
	BD-RE	Up to 6X	Up to 6X
	DVD-ROM	Up to 8X	Up to 8X
	DVD-R	Up to 8X	Up to 8X
	DVD-RW	Up to 8X	N/A
	DVD+R	Up to 8X	Up to 8X
	DVD+RW	Up to 8X	N/A
	BDMV (AACs Compliant Disc)	Up to 6X/2X (Read/Play)	N/A
	DVD-RAM	Up to 5X	N/A

### Technical Specifications - Removable Storage

	DVD-Video (CSS Compliant Disc)	Up to 8X/4X (Read/Play)	N/A
	CD-R/RW/ROM	Up to 24X	N/A
	CD-DA(DAE)	Up to 20X/10X (Read/Play)	N/A
<b>Access time</b> (typical reads, including settling)	Random	BD-ROM: 205 ms (typical), DVD-ROM: 185 ms (typical), CD-ROM: 165 ms (typical)	
	Full Stroke	BD-ROM: 350 ms (typical), DVD-ROM: 345 ms (typical), CD-ROM: 340 ms (typical)	
<b>Power</b>	Source	Slimline SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p	
	DC Current	5 VDC -1200 mA typical, 2000 mA maximum	
<b>Environmental conditions</b> (operating - non-condensing)	Temperature	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 80%	
	Maximum Wet Bulb Temperature	84° F (29° C)	

### HP Slim DVD-ROM Drive

<b>Height</b>	12.7mm		
<b>Orientation</b>	Either horizontal or vertical		
<b>Interface type</b>	SATA/ATAPI		
<b>Dimensions (W x H x D)</b>	5.04 x 0.5 x 5.0 in (128 x 12.7 x 127 mm) without bezel		
<b>Weight (max)</b>	Up to 0.37 lb (170 g) without bezel		
<b>Read speeds</b>	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X	
	DVD-ROM	Up to 8X	
	CD-ROM, CD-R	Up to 24X	
<b>Access time</b> (typical reads, including settling)	CD-RW	Up to 24X	
	Random	DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical)	
<b>Power</b>	Full Stroke	DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical)	
	Source	Slimline SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p	
<b>Environmental</b> (all conditions non-condensing)	DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum	
	Temperature	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 80%	
	Maximum Wet Bulb Temperature (operating)	84° F (29° C)	

### Technical Specifications – Memory

#### System Memory Support

The HP ProOne 600 G1 All-in-One Business PC supports the 4th generation Intel® Core™ processor families. Based on a new PC micro-architecture, the processor is designed for a two-chip platform consisting of a processor and Platform Controller Hub (PCH). Unlike previous generations, the processor includes an integrated memory controller (IMC). The IMC supports DDR3 protocols with two independent, 64-bit wide channels each accessing one SODIMM.

- Two channels of non-ECC DDR3 unbuffered small outline dual in-line memory modules (SODIMM) with a maximum of one DIMM per channel
- Single-channel and dual-channel memory organization modes
- Data burst length of eight for all memory organization modes
- DDR3 memory data transfer rates of up to 1600 MT/s; actual supported DDR3 data transfer rate determined by the configured processor
- 64-bit wide channels
- DDR3 system memory I/O voltage of 1.5V and 1.35V
- Theoretical Maximum Memory Bandwidth:
  - 10.6 GB/s in single-channel mode or 21.3 GB/s in dual-channel mode assuming DDR3 1333 MT/s
  - 12.8 GB/s in single-channel mode or 25.6 GB/s in dual-channel mode assuming DDR3 1600 MT/s
  - 16 GB maximum memory support

**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:

Slot 1 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.

Total Memory	Socket	
	Channel A (black)	Channel B (black)
2 GB	2 GB	Unpopulated
4 GB	4 GB	Unpopulated
8 GB (dual channel)	4 GB	4 GB
8 GB	8 GB	Unpopulated
16 GB (dual channel)	8 GB	8 GB

### Technical Specifications - Communications

#### Intel® I217LM GbE Network Connection (integrated)

<b>Connector</b>	RJ-45
<b>System Interface</b>	Integrated on PCA
<b>Controller</b>	Intel® Ethernet Controller I217LM
<b>Memory</b>	24 KB FIFO packet buffer memory Two Queues (Tx & Rx)
<b>Data rates supported</b>	10/100/1000 Mbps 802.1P 802.1Q 802.1as/1588
<b>IEEE Compliance</b>	802.3 802.3ab 802.3az 802.3u
<b>Bus architecture</b>	PCI Express and SMBus
<b>Data transfer mode</b>	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)
<b>Power requirement</b>	Requires 3.3Vdc with integrated regulators Thermal Design Power (TDP) 0.535 Watts
<b>Boot ROM support</b>	Yes
<b>Network transfer mode</b>	Full-duplex Half-duplex (not supported for the 1000BASE-T transceiver)
<b>Network transfer rate</b>	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
<b>Environmental</b>	Operating Temperature: 0° to 85° C Operating Humidity: 60% RH
<b>Management</b>	WOL, auto MDI crossover, PXE, Multi-port teaming, RSS, Advanced cable diagnostic, Smart speed operation
<b>Alerting</b>	ASF 2.0 support; AMT 7.0 support

#### Intel Centrino Advance-N 6205 Wireless Network Interface Connection

<b>Wireless LAN Standards</b>	IEEE 802.11a/b/g/n IEEE 802.11 e, 802.11i, 802.11d, 802.11d, 802.11h
<b>Interoperability</b>	Wi-Fi certified (802.11 a/b/g/n WMM, WPA, WPA2 and WPS) Tested with wireless access points from several major manufacturers OS compatible with Microsoft Windows, Win7 and XP Cisco Compatible Extensions Program compliant (802.11a/b/g only) with Microsoft Windows XP and Windows 7
<b>Frequency Band</b>	2.4 GHz and 5 GHz
<b>Antenna Structure</b>	2 transmit; 2 receive (2x2)
<b>Data Rates</b>	802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 66 possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11 n specification



### Technical Specifications - Communications

<b>Modulation</b>	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM	
<b>Security</b>	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES (support for key sizes of 128bits), TKIP, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP, MSCHAP, PEAP-MSCHAPv2, LEAP, EAP-FAST, EAP-SIM, EAP-AKA PAP, CHAP, TLS, GTC Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure product through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows XP only.	
<b>Sub-channels</b>	Multinational support with frequency bands and channels compliant to local regulations.	
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with ACK	
<b>Network Architecture Models</b>	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) Intel® My Wifi Technology (iPAN)	
<b>Roaming</b>	Provide seamless roaming between like access points (same frequency band)	
<b>Output Power (for CCK)</b>	15 dBm	
<b>Output Power (for OFDM; power varies by data rate)</b>	15 dBm	
<b>Power Consumption</b>	Transmit: 2.3 Watts (average, with one spatial streams) Receive: 1.9 Watts (average with two receive chains) Idle mode: 30mW - 40mW (average) Radio off: 20 mW (max)	
<b>Power Management</b>	ACPI compliant power management 802.11 compliant power saving mode	
<b>Antenna Connections</b>	3 U.FL type connectors, 50 ohm nominal impedance	
<b>Range</b>	802.11 a - Typical (@6 Mbps)	600 feet - Outdoor Open Area 150 feet - Indoor, Office environment
	802.11 b - Typical (@1 Mbps)	1200 feet - Outdoor Open Area 300 feet - Indoor, Office environment
	802.11 g - Typical (@1 Mbps)	1200 feet - Outdoor Open Area 300 feet - Indoor, Office environment
<b>Form Factor</b>	MiniPCI-Express	
<b>Weight</b>	0.013 lb (4.0 g)	
<b>Dimensions</b>	1.1 x 1.2 in (26.8 x 30.0 mm)	
<b>Operating Voltage</b>	3.3V +/- 9%, 1.5V +/- 5%	
<b>Temperature</b>	<b>Operating:</b>	32° to 176° F (0° to 80° C)
	<b>Non-operating:</b>	-40° to 176° F (-40° to 80° C)
<b>Humidity</b>	<b>Operating:</b>	10% to 90% (non-condensing)
	<b>Non-operating:</b>	5% to 90% (non-condensing)
<b>Configuration Utility</b>	Microsoft Windows XP	Microsoft Windows Win 7
	<ul style="list-style-type: none"> <li>• Microsoft Windows XP Wireless Network Connection Manager</li> <li>• Intel PROSet for Microsoft Windows XP (required for Cisco Compatible Extensions support)</li> </ul>	<ul style="list-style-type: none"> <li>• Intel IHV extensions for Win7 available to support Cisco Compatible Extensions</li> </ul>

### Technical Specifications - Communications

#### HP WLAN 802.11a/b/g/n Wireless 2x2 Dual-Band Minicard with Bluetooth Combo

<b>Dimensions (L x H)</b>	1.18 x 1.06 in (30 x 26.8 mm)
<b>Chipset</b>	Atheros AR9462
<b>System interface</b>	PCI-Express Mini Card
<b>Network standard</b>	802.11 a/b/g/n
	Bluetooth: 2.402 - 2.480 GHz
	Wi-Fi:
<b>Frequency band</b>	802.11a/n - 4.9 - 4.95 GHz (Japan), 5.15 - 5.25 GHz, 5.25 - 5.35 GHz, 5.47 - 5.725 GHz, 5.825 - 5.850 GHz
	802.11b/g/n 2.402-2.482 GHz
<b>Bluetooth</b>	The WLAN + Bluetooth Combo Mini Card meets all of the requirements to support Bluetooth 4.0 and is backwards compatible with 2.1 with EDR and 3.0 High speed.
<b>Operating temperature</b>	14° to 158°F, operating (-10° to 70°C, operating)
<b>Storage temperature</b>	-40° to 176°F, non-operating (-40° to 80°C, non-operating)
<b>Humidity</b>	10-90% operating 5-95% non-operating
<b>Operating voltage</b>	3.3 V ±9% I/O supply voltage

	Platform/WLAN Mode	Power Consumption
	<b>Wi-Fi</b>	
	Transmit Mode	2 W
	Receive Mode	1.6 W
	Idle mode (PSP) (WLAN Associated)	250mW
<b>Power Consumption</b>	Idle mode (WLAN unassociated)	100mW
	Radio disabled	75mW
	<b>Bluetooth</b>	
	Peak Operating	330 mW
	Receive	230 mW
	USB Selective Suspend	17 mW
<b>Output Power</b> (approximate)	2.4G: +13.5dBm minimum	
	5G: +12dBm minimum	
	IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only	
	802.1x authentication	
<b>Security</b>	WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES	
	IEEE 802.11i	
	Cisco Certified Extensions, all versions through V5	
	WAPI	
<b>Antenna</b>	Dual antenna connectors	

### Technical Specifications - Communications

#### Near Field Communications Controller, with Embedded Secure Element

<b>Dimensions (L x W x H)</b>	Module 10mm by 17mm by 1.8mm	
<b>Chipset</b>	NXP PN650 (PN544C3 and P5CN145 dies in a single VFBGA64 package)	
<b>System interface</b>	I2C	
<b>NFC RF standards</b>	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 ISO/IEC 18092 ECMA-340 NFCIP-1 Target and Initiator ECMA-320 NFCIP-2	
<b>NFC Forum Support</b>	Tag Type 1, Type 2, Type3 and Type 4, NFCIP-1 and NFCIP-2	
<b>Reader (PCD-VCD) Mode<sup>1</sup></b>	ISO/IEC 14443 A ISO/IEC 14443 B ISO/IEC 15693 MIFARE 1K MIFARE 4K FeliCa	
<b>Card Emulation (PICC-VICC) Mode<sup>1</sup></b>	ISO/IEC 14443 A ISO/IEC 14443 B and B' MIFARE FeliCa	
<b>Frequency</b>	13.56 MHz	
<b>NFC Modes Supported</b>	Reader/Writer, Peer-to-Peer, Card Emulation	
<b>Raw RF Data Rates</b>	106, 212, 424 kbps	
<b>Embedded Secure Element</b>	144 KB EEPROM, Data Memory or Program Memory 264 KB User ROM 7.5 KB RAM PKI (Public Key Infrastructure) coprocessor Dual Triple DES Key coprocessor NFC-WI interface to NFC controller, PN544 MIFARE 4 KB card emulation EEPROM data retention time 20 years, minimum	
<b>Operating temperature</b>	0°C to 70°C	
<b>Storage temperature</b>	-40° to 80°C	
<b>Humidity</b>	10-90% operating 5-95% non-operating	
<b>Supply Operating voltage</b>	2.97 to 5.25 Volts	
<b>I/O Voltage</b>	1.8V or 3.3V	
<b>Power Consumption (Supply 3.3 Volts)</b>	<b>Mode</b>	<b>Power Consumption, Typical<sup>2</sup></b>
	Reset	10 µW
	Standby	150 µW
	Card Emulation within Polling Loop	297 µW
	When generating RF	120 mW
	Transmitter Supply Current (Continuous wave)	30 mA
<b>Antenna</b>	Antenna connector, 0.5mm pitch, 5 connector FPC. Antenna matching is external to module.	

<sup>1</sup> With application or UICC support

<sup>2</sup>Actual Power Consumption is dependent on NFC antenna and matching circuit and on the particular polling sequence and period configured.

### Technical Specifications - Audio

#### Realtek ALC3228 High Definition Audio

<b>Type</b>	Integrated
<b>HD Stereo Codec</b>	Realtek ALC3228 4-channel codec
<b>Ports</b>	Line-In/Microphone input ports are 47K (nominal) at the pin Line-Out intended to drive an external 10K load (nominal) and an on board shunt resistor of 20-47K (nominal) Headphone-Out designed to drive 32 ohm (nominal) headphones or a 10K (nominal) load All ports are 3.5 mm
<b>Internal Speaker Amplifier</b>	2.2W/channel Class-D stereo BTL speaker amplifier@ 4 ohms and 5V
<b>Sampling</b>	The ALC3228 audio CODEC provides stereo 24-bit, full duplex resolution supporting sample rates up to 192kHz by the DAC and ADC. Additional sample rates are supported by the driver software.
<b>Analog Audio</b>	Yes
<b># of Channels on Line-Out</b>	4 Channels (2 stereo DACs and 2 stereo ADCs) with 24-bit resolution
<b>Internal Speaker</b>	Yes

#### DTS Studio Sound Technology

##### Introduction

**DTS Studio Sound** provides the ultimate audio and entertainment experience for all PC applications related to music, movies and games. Utilizing DTS' revolutionary 3D audio technology, DTS Studio Sound provides the most immersive and realistic listening experience unlike any solution ever offered for a two speaker playback environment. DTS Studio Sound offers a wider surround effect and significantly more natural positioning of audio for both 2D and 3D content and delivers immersive surround complete with deep, rich enveloping bass and crystal clear dialog. It also delivers high-frequency definition for crisp detail in any listening environment, ensuring users a premium and natural entertainment experience across any speaker configuration (desktop speakers or headphones).

##### DTS Studio Sound Features

- The ultimate multimedia audio experience
- Immersive surround sound from two speakers or headphones
- Extracts acoustic placement cues from original audio signal and adds near and far depth to the sound field to maximize 3D surround effect
- Custom-tuned solutions to provide superior natural sound from desktop speakers and headphones
- Maximum volume from small speakers
- Deep, rich bass and crystal clear dialog
- Intuitive user interface with presets for ease of use

##### DTS Studio Sound Benefits

- Provides a remarkably immersive 3D surround sound experience for business multimedia applications, complete with deep, rich enveloping bass, and crystal clear dialog
- Ability to personalize acoustic preferences with speaker and headphone optimization

### Technical Specifications - Audio

#### DTS Sound+ Technology

##### Introduction

**DTS Sound+** is a state-of-the-art solution suite which optimizes the audio experience for all business applications including VoIP, computer based training, business presentations and digital content creation for any speaker configuration (notebook/desktop speakers or headphones). DTS Sound+ delivers natural and immersive surround sound complete with deep, enveloping bass and crystal clear dialog which allows users to clearly hear audio and voice in communications or presentations and ensures that digital content can be experienced with uncompromised quality.

##### DTS Sound+ Features

- Premium audio experience for all applications including VoIP, Video Conferencing, Webcasts, Multimedia Presentations and Digital Content Creation
- Natural and Immersive sound from two speakers or headphones
- Custom-tuned solutions to provide superior natural sound from desktop speakers and headphones
- Crystal clear dialog
- Deep, rich bass
- Intuitive user interface with presets for ease of use

##### DTS Sound+ Benefits

- Turn your desktop into a multimedia powerhouse!
- Bring your business communication to life with natural sounding voice and clear dialog
- Increase productivity by making computer based training, webcasts and VoIP available anytime and anywhere with crystal clear audio
- Make presentations shine with rich, expansive sound without the need for external speakers
- Take digital content creation to a new level with deep bass, enhanced fidelity and immersive surround sound which ensures that your content is heard with uncompromised quality and detail

### Technical Specifications – Keyboards and Pointing Devices

#### HP USB Keyboard

	Keys	104, 105, 106, 107, 109 layout (depending upon country)	
<b>Physical characteristics</b>	Dimensions (L x W x H)	18.12 x 6.47 x 0.96 in (46.03 x 16.43 x 2.44 cm)	
	Weight	2 lb (0.9 kg)	
	Operating voltage	+ 5VDC ± 5%	
<b>Electrical</b>	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	
	Keycaps	Low-profile design	
	Switch actuation	55-g nominal peak force with tactile feedback	
	Switch life	20 million keystrokes (using Hasco modified tester)	
	<b>Mechanical</b>	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)	
<b>Environmental</b>		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	
<b>Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC		
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS		
<b>Kit contents</b>	Keyboard	Installation Guide	
	Warranty Card	Safety and Comfort Guide	

### Technical Specifications – Keyboards and Pointing Devices

#### HP PS/2 Keyboard

	Keys	104, 105, 106, 107, 109 layout (depending upon country)
<b>Physical Characteristics</b>	Dimensions (L x W x H)	18.12 x 6.47 x 0.96 in (46.03 x 16.43 x 2.44 cm)
	Weight	2 lb (0.9 kg) minimum
	Operating voltage	+ 5VDC ± 5%
	Power consumption	50-mA maximum (with three LEDs ON)
<b>Electrical</b>	System interface	PS/2 6-pin mini din connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC 99 - 2001	Functionally compliant
<b>Mechanical</b>	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	50-dBA maximum sound pressure level
	Operating temperature	32° to 104° F (0° to 40° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	15% to 80% (non-condensing at ambient)
	Non-operating humidity	15% to 90% (non-condensing at ambient)
<b>Environmental</b>	Operating shock	N/A
	Non-operating shock	65 inch 2.9 ms, six surface; 30g 266 inch/second; 50g 266 inch/second six surface
	Operating vibration	2-g peak acceleration
	Non-operating vibration	Starting at 5 Hz, vary the frequency of vibration from 5 to 500 Hz and back to 5 Hz at a Logarithmic sweep rate of 1 octave per minute.
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	29.93 in (76 cm) on concrete, 16-drop sequence
<b>Approvals</b>	CUL, ICES-003 Class B, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC	
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	

#### HP USB Smart Card (CCID) Keyboard

##### Introduction:

### Technical Specifications – Keyboards and Pointing Devices

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

- Protects against unauthorized access with smart card technology
- Delivers even greater security when combined with a HP ProtectTools smart card and the HP ProtectTools 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

#### Key Benefits:

<b>Physical Characteristics</b>	Keys	104, 105, 106, 107, 109 layout (depending upon country)
	Form factor	USB basic smart card keyboard
	Colors	Carbonite/Silver
	Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)
	Weight	2 lb (0.9 kg) minimum
	Operating voltage	+ 5VDC ± 5%
	Power consumption	100-mA maximum (with four LEDs ON)
<b>Electrical</b>	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
	Languages	30+ available
	Keycaps	Standard design
	Switch actuation	55 g nominal peak force with tactile feedback
<b>Mechanical</b>	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
	Operating temperature	50° to 122° F (10° to 50° C)



### Technical Specifications – Keyboards and Pointing Devices

	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	
<b>Environmental</b>	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	
	Support Interface	All ISO 7816 smart cards	
		Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)	
	Chipset	SCM STCIII	
	Standard APIs supported	PC/SC, EMV2000, CT-API	
	Power	USB Port	
		Short circuit detection (protects smart card and reader)	
		Power supply compliant with ISO7816 and EMV (5V, 60 mA)	
		Supports 3-V and 5-V cards	
<b>SmartCard Function</b>	Power consumption	100-mA maximum draw	
	Communication	From card	9600 bps to 330,000 bps
		From computer	12 Mbps (USB transfer speed)
	Landing mechanism	Contact device	Friction contact
		Card insertions rating	Up to 100,000 insertion cycles
	Interface modes	CCID protocol	
	Reader performance interface	USB connection	
	Electro-magnetic standards	Europe	2004/108/EC
		USA	USAFCC part 15
<b>Approvals</b>	CE-Mark, UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, EMV2000, USB-IF		
<b>Ergonomic Compliance</b>	ISO 9241-4, TUVGS		
<b>Kit Contents</b>	Keyboard, I/O Security and Documentation CD, warranty card		

### Technical Specifications – Keyboards and Pointing Devices

#### HP USB PS/2 Washable Keyboard

	Keys	104 (US) Layout, 105 (EU) layout - depending upon country
<b>Physical Characteristics</b>	Dimensions (L x W x H)	17.67x 6.62 x 1.38 in (449 x 168 x 35 mm)
	Weight	1.7 lb (0.77 kg) minimum
	Operating voltage	+ 5VDC ±5%
<b>Electrical</b>	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
	Keycaps	Stepped -profile design
	Switch actuation	55-g nominal peak force with tactile feedback
<b>Mechanical</b>	Switch life	20 million keystrokes
	Switch type	Contamination-resistant switch membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	7 ft (2.2 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	4° to 149° F (-20° to 65° C)
	Operating humidity	10% to 95% (non-condensing at ambient)
	Non-operating humidity	0% to 95% (non-condensing at ambient)
<b>Environmental</b>	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
<b>Operating system support</b>	Windows® 7, Windows Vista, Windows XP Professional	
<b>Approvals</b>	UL, cUL, FCC, CE, TUV GS, VCCI, BSMI, C-Tick, KCC, USB-IF, WHQL, EN/IEC 60601-1, IP66/NEMA4X	
<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	

### Technical Specifications – Keyboards and Pointing Devices

#### HP Wireless Keyboard and Mouse

<b>Keyboard</b>	Dimensions (H x L x W)	1.09 x 18.1 x 6.47 in (27.87 x 460.3 x 164.3 mm)
	Weight – Without Two AA Alkaline Batteries	1.94 lb (880 g)
<b>Mouse</b>	Dimensions (H x L x W)	1.46 x 4.53 x 2.47 in (37 x 115 x 62.9 mm)
	Weight – Without Two AA Alkaline Batteries	0.15 lb (67 g)
<b>Receiver</b>	Dimensions (H x L x W)	0.33x 1.79 x 0.72 in (8.4 x 45.5 x 18.4 mm)
	Weight	0.21 oz (5.9 g)
	Cable Length – Minimum	6 ft (1.8 m)
	Range	32.8 ft (10 m)
<p>Windows 7 Home Basic*, Windows 7 Home Premium*, Windows 7 Professional Edition 32*, Windows 7 Professional Edition 64*, Windows 7 Ultimate Edition 32*, Windows 7 Ultimate Edition 64* Windows Vista or Windows XP            Available USB port for the receiver            CD-ROM Drive</p> <p><i>*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 <a href="http://www.microsoft.com/windows/windows-7/">http://www.microsoft.com/windows/windows-7/</a> for details.</i></p>		
<b>System Requirements</b>	Product Safety	UL; CSA /TUV (Europe only); CE Mark; CB Report
	Ergonomics	ANSI; ISO (Europe only); GS Mark (Germany only)
	EMC	FCC; CE; ACA (-tick); BSMI; KC ; VCCI
	CE Mark	EN 55022:2010; EN 55024; EN 301489-1; EN 61000
	Design Guidelines for PCs	PC 99 - connector overmold colors; PC 2001 - full functionality
	Telecom	All local telecom requirements and approvals for intended markets
	USA	FCC Title 47 CFR, Par 15, Subpart C; other local requirements
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, Thailand, Canada, China, Japan, Korea, Taiwan, India, Venezuela, Ecuador, Russia, Ukraine, Israel, Croatia, United Arab Emirates, Peru, Brazil, Chile, Argentina, Mexico, South Africa, and up to 193 countries worldwide.	
<b>Environmental</b>	Keyboard contains 25% post-consumer recycled plastic material	

#### HP PS/2 Mouse

<b>Dimensions</b> (H x L x W)	1.46 x 2.48 x 4.53 in (3.70 x 6.29 x 11.50 cm)
<b>Weight</b>	3.53 oz (100g; +10g/- 5 g)

### Technical Specifications – Keyboards and Pointing Devices

	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)
<b>Environmental</b>	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
	Operating voltage	5 VDC ± 10%
	Power consumption	100mA
<b>Electrical</b>	System consumption	PS/2 mini-din connector
	ESD	CE level 4, 15 kV air discharge
	EMI-RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC99 - 2001	Functionally compliant
	Resolution	800 DPI
	Tracking speed	10 in/s (25.4 cm/s) maximum
	Acceleration	±15%
	Switch actuation	65±20 gf
<b>Mechanical</b>	Switch life	3,000,000 operations (using Hasco modified tester)
	Switch type	Low force micro-switches
	Tracking mechanism life	80 km
	Cable length	6 ft (1.8 m)
	Microsoft PC99 - 2001	Mechanically compliant
	Width	6 mm
	Diameter	22.5 ± 0.2 mm
<b>Scroll wheel</b>	Maximum rotation force	50 gf-cm
	Switch type	Light force micro-switch
	Switch life	1 million operations
	Mechanical life	Minimum 200,000 revolutions
<b>Regulatory Approvals</b>	UL/cUL, FCC, CE Mark, TUV/GS, VCCI, KCC, BSMI, C-Tick	

### Technical Specifications – Keyboards and Pointing Devices

#### HP USB Optical Mouse

<b>Dimensions</b> (H x L x W)	1.5x 4.5 x 2.5 in (3.7x 11.5 x 6.3 cm)
<b>Weight</b>	0.22 lb (0.10 kg)
<b>Cable length</b>	70.9 in (180 cm)
<b>System requirements</b>	Available USB port

#### HP USB 1000dpi Laser Mouse

<b>Dimensions</b> (H x L x W)	1.47 x 4.53 x 2.47 in (37.3 x 114.97 x 62.86 mm)	
<b>Weight</b>	3.360 oz (102g)	
<b>Cable length</b>	70.9 in (180 cm)	
<b>System requirements</b>	Available USB port	
<b>Environmental</b>	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)
<b>Mechanical</b>	Resolution	1000dpi
	Tracking Speed	45 cm/sec
	Cable Length	70.9 in (180 cm)

#### HP USB PS/2 Washable Mouse

<b>Dimensions</b> (H x L x W)	1.56 x 2.44 x 4.61 in (3.95 x 6.21 x 11.7 cm)	
<b>Weight</b>	4.44 oz (126 g)	
<b>Environmental</b>	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 (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face	
<b>Electrical</b>	Operating voltage	5 VDC ± 10%
	Power consumption	100mA
	System consumption	PS/2 mini-din connector
	ESD	CE level 4, 15 kV air discharge
	EMI-RFI	Conforms to FCC rules for a Class B computing device
	Microsoft® PC99 – 2001	Functionally compliant

### Technical Specifications – Keyboards and Pointing Devices

<b>Mechanical</b>	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
	<b>Scroll wheel</b>	Width
Diameter		1.01 in (25.6 mm)
Maximum rotation speed		48 rats/sec
Switch type		Light force micro-switch
Switch life		1 million operations
<b>Regulatory approvals</b>	Mechanical life	Minimum 200,000 revolutions
	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC
<b>Compatibility</b>	Operating system support	Windows 7, 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

\* 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>.

### Technical Specifications – Environmental Data

**Eco-Label Certifications & declarations** This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- US ENERGY STAR®
- EPEAT Gold registered in the United States. See <http://www.epeat.net> for registration status in your country.

**System Configuration** The configuration used for the Energy Consumption and Declared Noise Emissions data for the Ultra-slim Desktop model is based on a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

**Energy Consumption (in accordance with US ENERGY STAR® test method)**

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	36.82 W	36.84 W	36.91 W
Normal Operation (Long idle)	16.65 W	16.67 W	16.71 W
Sleep	1.87 W	1.86 W	1.86 W
Off	1.16 W	1.16 W	1.16 W

**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 PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

<b>Heat Dissipation</b>	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	126 BTU/hr	126 BTU/hr	126 BTU/hr
Normal Operation (Long idle)	57 BTU/hr	57 BTU/hr	57 BTU/hr
Sleep	6 BTU/hr	6 BTU/hr	6 BTU/hr
Off	4 BTU/hr	4 BTU/hr	4 BTU/hr

\*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)**

Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
3.4	22
3.4	22

**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:

- 6 USB ports
- 2 memory slots
- 1 Mini PCIe half-length slot
- 1 MXM 3.0 Type A - 35W slot
- 1 mSATA slot
- 1 2.5" internal bay supporting up to Two 2.5" hard drives (HDD/SSD/SED/SSHD)
- 1 5.25" external supporting optical drive

Spare parts are available throughout the warranty period and or for up to "5" years after the end of

### Technical Specifications – Environmental Data

	production.												
<b>Batteries</b>	This battery(s) in this product comply with EU Directive 2006/66/EC  Batteries used in the product do not contain: Mercury greater than 1ppm by weight Cadmium greater than 20ppm by weight  Battery size: CR2032 (coin cell) Battery type: Lithium												
<b>Additional Information</b>	<ul style="list-style-type: none"> <li>• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC.</li> <li>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>• This product is in compliance with the IEEE 1680 (EPEAT) standard at the &lt;gold&gt; level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>• This product contains 36% post-consumer recycled plastic (by wt.)</li> <li>• This product is 94.5% recycle-able when properly disposed of at end of life.</li> </ul>												
<b>Packaging Materials</b>	<table border="0"> <tr> <td><b>External:</b></td> <td>PAPER/Corrugated</td> <td>1490 g</td> </tr> <tr> <td></td> <td>PAPER/Paper</td> <td>94 g</td> </tr> <tr> <td><b>Internal:</b></td> <td>PLASTIC/EPE (Expanded Polyethylene)</td> <td>574 g</td> </tr> <tr> <td></td> <td>PLASTIC/Polyethylene low density</td> <td>39 g</td> </tr> </table> <p>The PAPER/Corrugated packaging material contains at least 55.5 % recycled content. The PLASTIC/EPE (Expanded Polyethylene) packaging materials contains at least 75% recycled content. The PLASTIC/Polyethylene low density packaging materials contains at least 75% recycled content. The PLASTIC/Polypropylene packaging materials contains at least 75% recycled content.</p>	<b>External:</b>	PAPER/Corrugated	1490 g		PAPER/Paper	94 g	<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	574 g		PLASTIC/Polyethylene low density	39 g
<b>External:</b>	PAPER/Corrugated	1490 g											
	PAPER/Paper	94 g											
<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	574 g											
	PLASTIC/Polyethylene low density	39 g											
<b>Material Usage</b>	<p>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: <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</a>):</p> <ul style="list-style-type: none"> <li>• Asbestos</li> <li>• Certain Azo Colorants</li> <li>• Certain Brominated Flame Retardants - may not be used as flame retardants in plastics</li> <li>• Cadmium</li> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>												
<b>Packaging</b>	HP follows these guidelines to decrease the environmental impact of product packaging:												



### Technical Specifications – Environmental Data

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

#### End-of-life Management and Recycling

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

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

#### Hewlett-Packard Corporate Environmental Information

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

Global Citizenship Report

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

Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/>

[PC\\_GBU\\_Product\\_Design\\_ISO\\_14K\\_Certificate.pdf](http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf)

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

### Options and Accessories (sold separately)

#### AFTER MARKET OPTIONS:

##### MEMORY

	<b>Part Number</b>
HP 2GB DDR3-1600 (PC3-12800) SODIMM	B4U38AA
HP 4GB DDR3-1600 (PC3-12800) SODIMM	B4U39AA
HP 8GB DDR3-1600 (PC3-12800) SODIMM	B4U40AA

##### DATA STORAGE DRIVES AND ACCESSORIES

	<b>Part Number</b>
HP 1TB, 7200 rpm, SATA -6.0 Gb/s	QK555AA
HP 500GB, 7200 rpm, SATA -6.0 Gb/s	QK554AA
HP 500GB SATA , 6G (8GB cache) Solid State Hybrid Drive (SSHD)	E1C62AA
HP 128GB SATA Solid State Drive	QV063AA
HP Slim SATA DVD-ROM Drive	VP033AA
HP Slim SATA BDXL Blu-Ray Writer Drive	EOX94AA
HP Slim SATA SuperMulti DVD Writer Drive	QS209AA

##### INPUT DEVICES - KEYBOARD AND MOUSE COMBO

	<b>Part Number</b>
HP USB PS/2 Washable Keyboard & Mouse	BU207AA
HP Wireless Keyboard & Mouse (Keyboard contains 25% post-consumer recycled plastic material)	QY449AA

##### INPUT DEVICES - KEYBOARD

	<b>Part Number</b>
HP PS/2 Keyboard	QY774AA
HP USB Grey Keyboard	B6B64AA
HP USB Smart Card (CCID) Keyboard	E6D77AA
HP USB Keyboard	QY776AA

##### INPUT DEVICES - MOUSE

	<b>Part Number</b>
HP PS/2 Mouse	QY775AA
HP USB 1000dpi Laser Mouse	QY778AA
HP USB Gray Mouse	K7W54AA
HP USB Mouse	QY777AA
HP Mouse Pad	AT485AA

##### SECURITY

	<b>Part Number</b>
HP UltraSlim Cable Lock	H4D73AA

##### GRAPHICS - VIDEO ADAPTERS AND CABLES

	<b>Part Number</b>
HP DisplayPort Cable Kit	VN567AA
HP DisplayPort To DVI-D Adapter	FH973AA
HP DisplayPort To HDMI Adapter	BP937AA
HP DisplayPort To VGA Adapter	AS615AA
HP DVI Cable	DC198A
USB Graphics Adapter	NL571AA

##### STANDS AND MONITOR ARM

**Part Number**

### Options and Accessories (sold separately)

AiO Height Adjustable and Reclining Stand	C1N43AA
HP Single Monitor Arm	BT861AA
HP (Flat Panel Monitor) Quick Release	EM870AA

#### MISCELLANEOUS

	Part Number
Belkin 7-Outlet Surge Protector for North America 120V	AG290AA
Belkin USB to Serial Adapter	EM449AA
Belkin CAT5e Patch Cable RJ45/RJ45	AH122AA
HP Business Headset	QK550AA

#### ADDITIONAL MONITORS FOR MULTI-DISPLAY CONFIGURATIONS

	Part Number
HP EliteDisplay E201 20-inch LED Backlit Monitor	C9V73AA
HP EliteDisplay E221 21.5-inch LED Backlit Monitor	C9V76AA
HP EliteDisplay E231 23-inch LED Backlit Monitor	C9V75AA
HP Compaq LA2206xc 21.5-inch Webcam LCD Monitor	LW490AA
HP LA2405x 24-inch LED Backlit Monitor	D0P36AA
HP EliteDisplay E271i 27-inch LED Backlit Monitor	D7Z72AA
HP EliteDisplay E221c 21.5-inch WebCam LED Backlit Monitor	D9E49AA
HP L2206tm 21.5-inch LED Backlit Touchscreen Monitor	B0L55AA

#### LANDESK SOFTWARE (E-DELIVERY)

	Part Number
Contact your HP representative for available options.	N/A

### Summary of Changes

Date	Version History	Action	Description of Change
July 18, 2014	From v15 to v16	Addition	Added more processors to the link
		Addition	Added a new WLAN card
August 6, 2014	From v16 to v17	Change	Change the title, removeds the caps
September 26 ,2014	From v17 to v18	Change	Change the environmental data chart
November 12, 2014	From v18 to v19	Changes	Several changes from Rebeca across the document
December 1, 2014	From v19 to v20	Upgrade	Change version to sync up concentra
January 21, 2015	From v20 to v21	Addition	Added a note about Current Leakage, under POWER
February 23, 2015	From v21 to v22	Addition	Added "Support for up to 3 storage drives (2 SATA, 1 mSATA)" to At a glance
		Removed	Removed "up to 160GB Solid State Drive" from at a glance Removed "up to 160GB Solid State Drive" from 2.5" SATA Hard Drive Remove chart of HP 160 GB Solid State Drive Removed HP 160 GB SATA Solid State Drive from "DATA STORAGE DRIVES AND ACCESSORIES"

© Copyright 2015 Hewlett-Packard Development Company, L.P. All rights reserved.

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. Microsoft, Windows and Windows 7 are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. Intel and Core 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.