## Overview

### HP ProDesk 600 G1 Small Form Factor Desktop Business PC
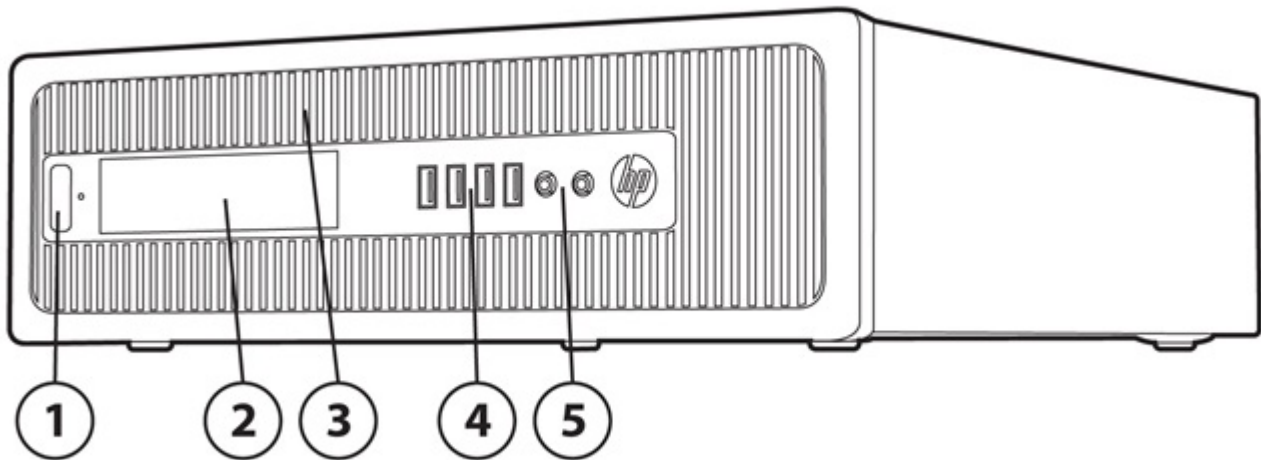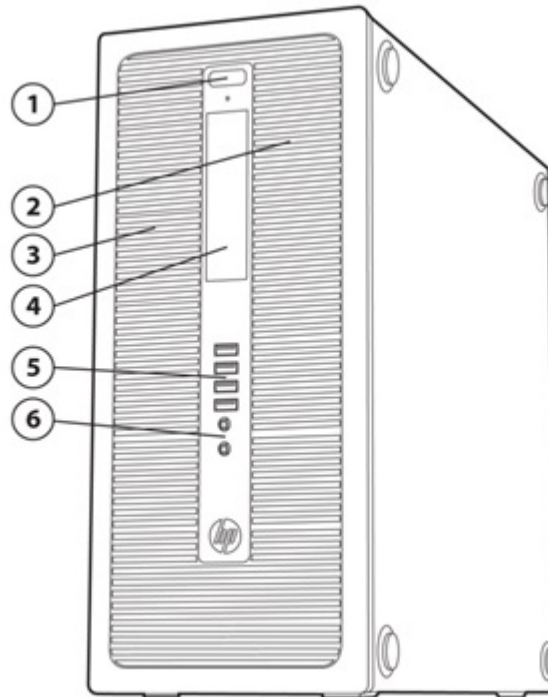


| | |
|---|---|
| 1. | Power button and PC status LED |
| 2. | 3.5" external drive bay |
| 3. | Slimline drive bay supporting an optical disk drive (located behind removable bezel) |
| 4. | (2) USB 3.0 ports, (2) USB 2.0 ports |
| 5. | 3.5mm headphone output and microphone jack |

**Not Shown**

| | |
|---|---|
| Slots | (1) PCI Express x16 graphics connectors<br>(3) PCI Express x1 accessory connectors |
| Bays | (1) 2.5" internal storage drive bay<br>(1) 3.5" internal storage drive bay |
| Rear I/O | (2) USB 3.0 ports; (4) USB 2.0 ports<br>(1) VGA video port; (2) DisplayPort with multi-stream video ports<br>(1) RJ-45 network connector<br>(1) RS-232 serial port<br>3.5mm audio in/out jacks<br>PS/2 keyboard and mouse ports |

## Overview

### HP ProDesk 600 G1 Tower Business PC

1.   Power button and PC status LED

2.   Slimline drive bay supporting an optical disk drive (located behind removable bezel)

3.   5.25" half height external drive bay (located behind removable bezel)

4.   3.5" external drive bay

5.   (2) USB 3.0 ports, (2) USB 2.0 ports

6.   3.5mm headphone output and microphone jack

    <u>Not Shown</u>

Slots   (1) PCI Express x16 graphics connectors
        (3) PCI Express x1 accessory connectors

Bays    (1) 2.5" internal storage drive bay
        (2) 3.5" internal storage drive bay

Rear I/O   (2) USB 3.0 ports; (4) USB 2.0 ports
           (1) VGA video port; (2) DisplayPort with multi-stream video ports
           (1) RJ-45 network connector
           (1) RS-232 serial port
           3.5mm audio in/out jacks
           PS/2 keyboard and mouse ports

## Overview

### At A Glance

- Choice of Small Form Factor or Tower chassis options
- PC chassis and all internal components and modules are manufactured with low halogen content
- HP developed and engineered UEFI BIOS for better security, manageability and software image stability
- Intel® Q85 chipset supporting Intel 4th generation Core processors, featuring integrated Intel HD Graphics and Intel® Standard Manageability Technology
- Intel® Ethernet Connection I217L GbE LOM integrated network connection
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Multi-independent monitor support via VGA and dual digital DisplayPort video interfaces with multi-stream
- Discrete graphics options available
- DTS Sound audio management software
- Standard and high efficiency energy saving power supply options
- ENERGY STAR qualified models certified EPEAT Gold
- Guaranteed lengthy purchase lifecycles and image stability

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

### OPERATING SYSTEM

| | |
|---|---|
| **Preinstalled When Purchased** | Windows 8 Pro (64-bit)* |
| | Windows 8 (64-bit)* |
| | Windows 7 Ultimate (32-bit)** |
| | Windows 7 Ultimate (64-bit)** |
| | Windows 7 Professional (32-bit)** |
| | Windows 7 Professional (64-bit)** |
| | Windows 7 Professional (32-bit) (available through downgrade rights from Windows 8 Pro)*** |
| | Windows 7 Professional (64-bit) (available through downgrade rights from Windows 8 Pro)*** |
| | Windows 7 Home Premium (32-bit)** |
| | Windows 7 Home Premium (64-bit)** |

FreeDOS 2.0
Novell SUSE Linux Enterprise Desktop 11

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

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

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

### CHIPSET

| | SFF/TWR |
|---|---|
| Intel® Q85 Express | X |

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

## PROCESSOR

|  | SFF/TWR |
|---|---|
| **Intel® 4th Generation Core™ i7 Processors** | |
| Intel® Core™ i7-4770 Processor<br>Up to 3.9 GHz Max. Turbo Frequency (3.4 GHz base frequency)<br>8 MB cache, 4 cores, 8 threads<br>Intel HD Graphics 4600<br>Supports DDR3 memory up to 1600 MT/s data rate<br>Supports Intel® Stable Image Platform Program (SIPP) | X |
| **Intel® 4th Generation Core™ i5 Processors** | |
| Intel® Core™ i5-4570 Processor<br>Up to 3.6 GHz Max. Turbo Frequency (3.2 GHz base frequency)<br>6 MB cache, 4 cores, 4 threads<br>Intel HD Graphics 4600<br>Supports DDR3 memory up to 1600 MT/s data rate<br>Supports Intel® Stable Image Platform Program (SIPP) | X |
| Intel® Core™ i5-4670 Processor<br>Up to 3.8 GHz Max. Turbo Frequency (3.4 GHz base frequency)<br>6 MB cache, 4 cores, 4 threads<br>Intel HD Graphics 4600<br>Supports DDR3 memory up to 1600 MT/s data rate<br>Supports Intel® Stable Image Platform Program (SIPP) | X |

## GRAPHICS

|  | SFF/TWR |
|---|---|
| **Intel integrated HD Graphics on all models (depends on processor)** | X |
| **Optional Discrete Graphics Solutions** | |
| AMD Radeon HD 8350 (1GB) PCIe x16 | X |
| AMD Radeon HD 8490 (1GB) PCIe x 16 | X |
| NVIDIA NVS 310 (512 MB) PCIe x16 | X |
| NVIDIA NVS 315 (1GB) PCIe x 16 | X |
| NVIDIA GeForce GT630 (2 GB) FH PCIe x16 | **TWR only** |
| **Adapters and Cables** | |
| HP DMS-59 to Dual DisplayPort Cable | X |
| HP DMS-59 to Dual DVI Cable | X |
| HP DMS-59 to Dual VGA Cable | X |
| HP DisplayPort to DisplayPort Cable | X |
| HP DisplayPort to DVI-D Adapter | X |
| HP DisplayPort to HDMI Adapter | X |
| HP DisplayPort to VGA Adapter | X |

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

| | |
|---|:---:|
| HP Serial Port Adapter | **X** |
| HP Parallel Port Adapter | **X** |

# STORAGE

| **Hard Drive** | **SFF/TWR** |
|---|:---:|
| 320 GB, 7.2K rpm, SATA 6.0 Gb/s, SMRT IV, 2.5" | **X** |
| 500 GB, 7.2K rpm, SATA 6.0 Gb/s, SMART IV, 2.5" | **X** |
| 500 GB, 7200 rpm, SATA 6.0 Gb/s, SMART IV, 3.5" | **X** |
| 500GB, 10K rpm, SATA, 6.0Gb/s, SMART IV, 3.5" | **X** |
| 1 TB, 7200 rpm, SATA 6.0 Gb/s, SMART IV, 3.5" | **X** |
| 1 TB, 10K rpm, SATA 6.0 Gb/s, SMART IV, 3.5" | **X** |
| 2 TB, 7200rpm, SATA 6.0 Gb/s, SMART IV, 3.5" | **X** |

**Hybrid Drives**
**NOTE:** Solid State Hybrid Drives are planned to be available in October 2013.

| | |
|---|:---:|
| 500GB SATA 6G 2.5 (8GB cache) SSHD Drive | **X** |
| 500GB SATA 6G 2.5 2nd Drive (8GB cache) with 3.5" adapter when install in SFF/TWR | **X** |
| 1TB SATA 6G 2.5 (8GB cache) SSHD Drive | **X** |
| 1TB SATA 6G 2.5 2nd Drive (8GB cache) with 3.5" adapter when install in SFF/TWR | **X** |

**Solid State Drives**

| | |
|---|:---:|
| 120 GB SATA 6G 2.5 SSD (with 3.5" adapter when installed in SFF/TWR) | **X** |
| 128 GB (with 3.5" adapter when installed in SFF/TWR) | **X** |
| 160 GB (with 3.5" adapter when installed in SFF/TWR) | **X** |

**SATA Self-encrypting Solid State Drive**

| | |
|---|:---:|
| 256 GB (with 3.5" adapter when installed in SFF/TWR) | **X** |

**Optical Disc Drives**

| | |
|---|:---:|
| Slim DVD-ROM | **X** |
| Slim BDXL Blu-ray Writer | **X** |
| Slim SuperMulti DVD Writer | **X** |

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

### MEMORY

| Form Factor | Type | Maximum | # of Slots |
|---|---|---|---|
| Small Form Factor | DDR3 non-ECC<br>Up to 1600 MT/s | 32 GB | 4 DIMM |
| Tower | DDR3 non-ECC<br>Up to 1600 MT/s | 32 GB | 4 DIMM |

**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.

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.

### PERFORMANCE

| Intel® Smart Response Technology Disk Cache Modules | SFF/TWR |
|---|---|
| 32GB SATA Solid State Disk Cache | X |

### NETWORKING/COMMUNICATIONS

| Ethernet (RJ-45) | |
|---|---|
| Intel I217LM Gigabit Network Connection (standard) | X |
| Intel Ethernet I210-T1 PCIe x1 Gb Network Interface Card (optional) | X |

| Wireless | |
|---|---|
| Intel Centrino Advanced-N 6205 802.11 a/b/g/n PCI Express x1 Network Interface Card (optional) | X |

### AUDIO/MULTIMEDIA

| | SFF/TWR |
|---|---|
| HD audio with Realtek ALC221 codec (all ports are stereo) | X |
| DTS Studio Sound audio management technology | X |
| Microphone* and headphone front ports (3.5mm) | X |
| Line-out and Line-In rear Ports* (3.5mm) | X |
| Multi-streaming capable* | X |
| Internal speaker (standard) | X |

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

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

## KEYBOARDS AND POINTING DEVICES

| Keyboard | SFF/TWR |
|---|---|
| HP PS/2 Keyboard | X |
| HP USB Keyboard | X |
| USB Smart Card (CCID) Keyboard | X |
| HP USB and PS/2 Washable Keyboard | X |
| HP Wireless Keyboard and Mouse Combo | X |

| Mice | |
|---|---|
| HP PS/2 Mouse | X |
| HP USB Mouse | X |
| HP USB 1000dpi Laser Mouse | X |
| HP USB and PS/2 Washable Mouse | X |

## HP BIOS

Key features of the HP BIOS include:

- Deployment and manageability - HP BIOS provides several technologies that help integrate the HP ProDesk 600 G1 Series 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.
- UEFI specification 2.1
- Computrace agent - For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management - The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Business Desktop computer in any enterprise environment.
- Acoustic performance - Industry leading acoustic emissions across the range of operating conditions.
- Serviceability - HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery - HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (DOSFlash), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery.

Additional HP BIOS Features:

- Power-On password - Helps prevent an unauthorized user from powering on the system.
- Administrator password - Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) - Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP Elite models use ACPI to provide power conservation features.

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

S5 Max Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 1W is S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.

## SECURITY

|  | SFF/TWR |
| --- | --- |
| Trusted Platform Module (TPM) 1.2 | X |
| SATA port disablement (via BIOS) | X |
| Drive lock | X |
| Intel® Identify Protection Technology (IPT)[1] | X |
| Serial, parallel, USB enable/disable (via BIOS) | X |
| Optional USB Port Disable at factory (user configurable via BIOS) | X |
| Removable media write/boot control | X |
| Power-On password (via BIOS) | X |
| Setup password (via BIOS) | X |
| HP Chassis (1 bay) Security Kit | TWR only |
| Solenoid Hood Lock / Sensor | X |
| Support for chassis padlocks and cable lock devices | X |

[1]Models configured with Intel Core processors have the ability to utilize advanced security protection for online transactions. IPT, used in conjunction with participating web sites, provides double identity authentication by adding a hardware component in addition to the usual user name and password. IPT is initialized through an HP Client Security module

## POWER SUPPLIES

|  | SFF | TWR |
| --- | --- | --- |
| Standard efficiency | 240 W active PFC | 320 W active PFC |
| High efficiency | 240 W 90% efficient active PFC | 320 W 90% efficient active PFC |
|  | 240W 92% efficient active PFC | 320W 92% efficient active PFC |

## ENVIRONMENTAL & REGULATORY

ENERGY STAR® qualified models available

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

Low halogen (chassis, all internal components and modules)

TAA compliant

# QuickSpecs

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

## PORTS

### I/O Ports - Standard

|  | SFF/TWR |
|---|---|
| USB 2.0 | 2 (front)<br>4 (rear) |
| USB 3.0 | 2 (front)<br>2 (rear) |
| Serial (RS-232 | 1 |
| PS/2 | 1 keyboard (purple<br>1 mouse (green) |
| Video | 1 VGA (analog)<br>2 DisplayPort with multi-stream |
| Audio | 3.5mm headphone & mic jacks (front)<br>3.5mm audio in & out jacks (rear) |
| Network Interface | 1 RJ-45 |

### I/O Ports - Optional

|  | SFF/TWR |
|---|---|
| 2nd Serial (RS-232) | 1 |
| Parallel | 1 |

## SLOTS

|  | SFF/TWR |
|---|---|
| PCI Express x1 | 3 |
| PCI Express x16 | 1 |

## BAYS

|  | SFF/TWR |
|---|---|
| Media Card Reader | 1 |
| Slim Optical Disc Drive | 1 |
| 3.5" internal storage drive | 1 - SFF<br>2 - TWR |
| 2.5" internal storage drive | 1 |

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

### SERVICE AND SUPPORT

On-site Warranty [1]: Three-year (3-3-3) limited warranty delivers three years of on-site, next business day [2] service for parts and labor and includes free telephone support [3] 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

**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 – Operating Systems, Software and eDocumentation

### OPERATING SYSTEMS

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

For all Preinstalled operating systems HP provides Microsoft WHQL certified (where applicable) drivers on www.hp.com at the time of product announcement.

| | |
|---|---|
| **Web Support** | Windows 7 Enterprise (32-bit or 64-bit) |
| | Windows 8 (64-bit) |
| | Windows 8 Pro (64-bit)* |
| | Windows 8 Enterprise (64-bit)** |

For all Supported operating systems HP performs testing of the OS, and makes available all HP value add software (OS dependent). Certified drivers are made available on www.hp.com within 30 days of product announcement.

| | |
|---|---|
| **Limited Support** | Windows ® XP Professional (32-bit) |

For all Limited Support operating systems HP will make available on www.hp.com certified drivers for major subsystems, if not provided by the operating system, within 30 days of product announcement.

HP performs functional testing on representative configurations. Some newer technologies may not be supported.

HP value added software and 3rd party applications (i.e. DVD players) are not supported.

| | |
|---|---|
| **Certified** | Novell SUSE Linux Enterprise Desktop 111 |
| | Red Hat Enterprise Linux 641 |

For all Certified operating systems HP will submit hardware to the operating system vendor for testing and certification. All drivers would be obtained from the operating system vendor, not supplied by HP. Certification will be posted by the operating system vendor.

| | |
|---|---|
| **Test & Document** | Windows® Vista Enterprise (32-bit or 64-bit) |
| | Windows® Vista Professional (32-bit or 64-bit) |

For all Test & Document operating systems HP will perform functional testing of the operating system on the HP business PC platform. Any issues found will be documented in an Engineering Advisory and/or Service Advisory and posted to www.hp.com. HP will not develop or qualify any drivers or perform any integration testing.

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

**Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.
***This system is preinstalled with Windows® 7 Pro software and also comes with a license and media for Windows 8 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

## Technical Specifications – Operating Systems, Software and eDocumentation

[1]The following features are not supported by Novell SUSE Linux Enterprise Desktop:

- Intel Gigabit CT Desktop NIC
- Broadcom NetXtreme Gigabit Ethernet Plus
- HP 16-in-1 Media Card Reader
- HP Client Security
- HP Blu-ray Writer playback of commercial movies
- DisplayPort video interface
- HP 2nd serial port adapter
- Power Management features

Systems configured with Linux do not qualify for ENERGY STAR®

The following features are not supported by Red Hat Enterprise Linux 64:

- TPM v1.2 embedded Security Chip
- Intel Gigabit CT Desktop NIC
- HP Wireless 802.11b/g/n NIC
- HP 16-in-1 Media Card Reader
- HP Blu-ray Writer
- HP 2nd serial port Adapter
- HP USB Smart Card (CCID) Keyboard
- Power Management features

Systems configured with Linux do not qualify for ENERGY STAR®

## SSOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

| Included | Windows 7 | Windows 8 |
|---|---|---|
| **Security** | Computrace (status tracing)[1] | Computrace (status tracing) [1] |
| | Device Access Manager | Device Access Manager |
| | Drive Encryption | Drive Encryption |
| | File Sanitizer (Activated via Wizard) | File Sanitizer (Activated via Wizard) |
| | Disk Sanitizer (external version)2 | Disk Sanitizer (external version)2 |
| | Microsoft Security Essentials | Microsoft Defender |
| | HP Client Security | Secure Erase |
| | | HP Client Security |
| **MultiMedia** | Cyberlink Media Suite | Cyberlink Media Suite |
| | Cyberlink PhotoDirector | Cyberlink PhotoDirector |
| | Cyberlink Power Director | Cyberlink Power Director |
| | Cyberlink Power DVD, BD | Cyberlink Power DVD, BD |
| | Cyberlink Power2Go (Secure Burn) | Cyberlink Power2Go (Secure Burn) |
| **Communication** | | HP Wireless Hotspot |
| **HP Value Add** | HP ePrint Driver[3] | HP ePrint Driver[3] |
| | HP PageLift | HP PageLift |
| | HP Support Assistant | HP Recovery Manager |
| | HP Recovery Disk Creator | HP Support Assistant |
| | | HP QuickStart |

## Technical Specifications – Operating Systems, Software and eDocumentation

| **3rd Party** | Adobe Flash Player | Bing Search |
| --- | --- | --- |
| | Bing Search for Internet Explorer 10 | Evernote |
| | Box | PDF Complete, Corporate Edition |
| | Evernote | Skype |
| | PDF Complete | |
| | Skype | |
| **Microsoft Products** | Buy Office | Buy Office |

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

[2] Available via download

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

Technical Specifications – Core vPro Processors

## INTEL 4th GENERATION CORE vPRO PROCESSORS

All HP ProDesk 600 G1 Business PC models include processors that are part of the Intel 2013 Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the ProDesk 600, thus making these models the most stable, secure, and manageable platforms available to enterprises today.

## Technical Specifications - Graphics

## Intel HD Graphics

| | |
|---|---|
| **VGA Controller** | Integrated |
| **DisplayPort** | 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) |
| **Bus Type** | N/A |
| **RAMDAC** | N/A |
| **Memory** | Intel graphics do not have dedicated memory but utilizes some of the computer's system memory The amount of memory used for graphics depending on the amount of system memory installed, BIOS settings, operating system, and system load. 32 MB is pre-allocated for graphics use at system boot time. Additional memory can be allocated at boot time by the BIOS for PAVP (Protected Audio Video Playback) support for playback of protected video content. |
| | Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use. |

**Maximum Graphics Memory**

| Microsoft Windows 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.

**Maximum Color Depth**   32 bits/pixel

**Graphics/Video API Support**   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

## Technical Specifications - Graphics

| 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 |
| 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

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

## Technical Specifications - Graphics

### 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 |

## NVIDIA NVS 310 Graphics Card

| | |
|---|---|
| **Introduction** | The NVIDIA® NVS™ 310 Graphics Card is a PCI Express low profile form factor graphics add-in card targeted as an active low cost graphics solution for the corporate business and enterprise markets. |
| | The NVIDIA® NVS 310 graphics card is an ideal solution for customers requiring a small form factor graphics add-in card for either standard or small form factor PC designs. |
| **Performance and Features** | The NVIDIA® NVS 310 Graphics Card offers 512 MB of ultrafast DDR3 memory and is capable of supporting up to 2 displays. |
| | DisplayPort connector supports multimode technology to support connection to DVI-D, VGA and HDMI monitors with optional adapters in kits NR078AA, FH973AT, BP937AA, AS615AA. |
| | For a DisplayPort to DisplayPort connections use the optional DisplayPort Cable Kit VN567AA. |
| **Form Factor** | Low Profile: 2.713 × 6.15 in |
| **Graphics Controller** | NVIDIA® NVS 310 |
| **Memory Clock** | 875MHz |
| **Memory Size** | 512 MB DDR3 |
| **Memory Bandwidth** | 14 GB/s |
| **Max. Power** | 19.5W |
| **Display Max. Resolution** | Up to 2560 x 1600 (digital display) per display |
| **Display Output** | Up to 2 displays in the following configurations |

DisplayPort output:
- Drives two DisplayPort enabled digital display at resolutions up to 2560 × 1600 at 60 Hz with reduced blanking, when connected natively using the 2 DisplayPort connectors on the NVS 310 graphics card
- Supports 2 monitors up to resolution of 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort Multi-Stream topology technology.

## Technical Specifications - Graphics

| | |
|---|---|
| DVI-D output: | • Drives two digital display at resolutions up to 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort to DVI-D single-link cable adaptors |
| | • Drives two digital display at resolutions up to 2560× 1600 at 60 Hz with reduced blanking using DisplayPort to DVI-D dual-link cable adaptors |
| HDMI output: | • NVS 310 is capable of driving two high definition (HD) panels up to resolutions of 1920 × 1080P at 60 Hz using DisplayPort to HDMI cable adaptors |
| VGA display output: | • Drives two analog display at resolutions up to 1920 × 1200 at 60 Hz using DisplayPort to VGA cable adaptors |

### 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 | DisplayPort to VGA | DisplayPort to DVI-D | DisplayPort to HDMI | DisplayPort |
|---|---|---|---|---|
| 640 x 480 | 85 | 60 | 60 | 60 |
| 800 x 600 | 85 | 60 | 60 | 60 |
| 1024 x 768 | 85 | 60 | 60 | 60 |
| 1280 x 720 | 85 | 60 | 60 | 60 |
| 1280 x 1024 | 85 | 60 | 60 | 60 |
| 1440 x 900 | 75 | 60 | 60 | 60 |
| 1600 x 1200 | 60 | 60 | 60 | 60 |
| 1680 x 1050 | 60 | 60 | 60 | 60 |
| 1920 x 1080 | 60-R | 60-R | 60 | 60 |
| 1920 x 1200 | 60-R | 60-R | | 60 |
| 1920 x 1440 | | | | 60 |
| 2048 x 1536 | | | | 60 |
| 2560 x 1600 | | | | 60 |

## NVIDIA GeForce GT630 Graphics Card

**Introduction**

The NVIDIA GeForce GT630 DP (2GB) PCIe x16 Card Graphics Card provides a full height, PCI Express x16 graphics add-in card solution based on the NVIDIA Kepler Architecture GPU. The card is designed to support three display connections through its DVII, and two DisplayPort connectors.

An ideal solution for desktop PC customers seeking enhanced 2D and advanced 3D graphics performance, the NVIDIA GeForce GT630 DP (2GB) PCIe x16 Cards are an excellent choice for business users who want run multiple displays from a single graphics board. Engage in Web conferencing or video or photo editing, while improving your everyday business PC experience with better graphics and excellent visual display quality.

**Performance and Features**

The NVIDIA GeForce GT630 DP (2GB) PCIe x16 Cards deliver superior PCI Express (PCIe) Gen 3 features including:

- Unprecedented flexibility for new applications and enhanced performance
- Support for NVIDIA surround technology
- Run multiple displays from a single graphics card

## Technical Specifications - Graphics

- Full 16 lane PCIe Generation 3 bus support with peak bandwidth support
- Wireless Display ready for future support

| | |
|---|---|
| **Form Factor** | PCIe x16 Card |
| **Graphics Controller** | NVIDIA Kepler Architecture GPU |
| **Core Clock** | 875 MHz |
| **Memory Clock** | 891 MHz |
| **Memory Size** | 2 GB DDR3 128 bit |
| **Memory Bandwidth** | 28.5 GB/s |
| **Display Max. Resolution** | 2560 x 1600 digital, 2048 x 1536 analog |
| **Display Output** | Integrated 400 MHz RAMDAC |

### 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 | Maximum Refresh Rates (Hz) | |
|---|---|---|
| | Analog Connection | Digital Connection |
| 640 x 480 | 85 | 60 |
| 800 x 600 | 85 | 60 |
| 1024 x 768 | 85 | 60 |
| 1280 x 720 | 85 | 60 |
| 1280 x 1024 | 85 | 60 |
| 1440 x 900 | 75 | 60 |
| 1600 x 1200 | 85 | 60 |
| 1680 x 1050 | 75 | 60 |
| 1920 x 1080 | 85 | 60-R |
| 1920 x 1200 | 85 | 60-R |
| 1920 x 1440 | 85 | 60 |
| 2048 x 1536 | 75 | 60 |
| 2560 x 1600 | N/A | 60 |

## Technical Specifications - Graphics

### NVIDIA NVS 315 1GB PCIe x 16 Graphics Card

| | |
|---|---|
| **Introduction** | Get efficient dual-display graphics performance in a PCI Express low-profile graphics card with the NVIDIA NVS 315 PCIe x16 1 GB Graphics Card, an ideal desktop graphics solution for professional business and commercial applications. |
| **Performance and Features** | The NVIDIA® NVS 315 Graphics Card offers 1 GB of ultrafast DDR3 memory and is capable of supporting up to 2 displays. |
| | DisplayPort connector supports multimode technology to support connection to DVI-D, VGA and HDMI monitors with optional adapters in kits NR078AA, FH973AT, BP937AA, AS615AA. |
| | For a DisplayPort to DisplayPort connections use the optional DisplayPort Cable Kit VN567AA. |
| **Form Factor** | Low Profile: 2.713 × 6.15 in |
| **Graphics Controller** | NVIDIA® NVS 315 |
| **Memory Clock** | 875MHz |
| **Memory Size** | 512 MB DDR3 |
| **Memory Bandwidth** | 14 GB/s |
| **Connectors** | DMS-59 , with support for dual VGA, dual DVI or dual Display Port with the appropriate adapter cable |
| **Display Max. Resolution** | Up to 2048 x 1536 VGA; 1920 x 1200 DVI; 2560 x 1600 DisplayPort |
| **Display Output** | Up to 2 displays in the following configurations |

**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 | Maximum Refresh Rates (Hz) by Connection | |
|---|---|---|
| | Analog Connection | Digital Connection |
| 640 x 480 | 85 | 60 |
| 720 x 480 | 85 | 60 |
| 720 x 576 | 85 | 60 |
| 800 x 600 | 85 | 60 |
| 1024 x 768 | 85 | 60 |
| 1280 x 720 | 85 | 60 |
| 1280 x 768 | 85 | 60 |
| 1280 x 1024 | 85 | 60 |
| 1440 x 900 | 75 | 60 |
| 1600 x 1024 | 85 | 60 |
| 1600 x 1200 | 85 | 60 |
| 1680 x 1050 | 75 | 60 |
| 1920 x 1080 | 85 | 60-R |
| 1920 x 1200 | 85 | 60-R |
| 1920 x 1440 | 85 | N/A |
| 2048 x 1536 | 75 | N/A |
| 2560 x 1440 | N/A | 60* |
| 2560 x 1600 | N/A | 60* |

## Technical Specifications - Graphics

*Display Port Only*

### AMD Radeon HD 8350 1GB PCIe x16 DH Graphics Card

| | |
|---|---|
| **Introduction** | Get stable 2D and advanced 3D graphics performance from the AMD Radeon HD 8350 1 GB PCIe x16 DH Graphics Card, a low profile, PCI Express x16 graphics add-in card based on the AMD Radeon HD 8350 GPU, great for Web conferencing or video and photo editing. |
| **Form Factor** | PCIe x16 |
| **Graphics Controller** | AMD Radeon HD 8350 |
| **Core Clock** | GPU engine operates at 523 MHz |
| **Memory** | 1GB, DDR3, SDRAM |
| **Memory Clock** | 875 MHz |
| **HDCP Support** | Yes |
| **Display Max. Resolution** | Digital 1920 x 1200<br>Analog 2048 x 1536 |

**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

| | Analog Connection | Digital Connection |
|---|:---:|:---:|
| 640 x 480 | 85 | 60 |
| 720 x 480 | 85 | 60 |
| 720 x 576 | 85 | 60 |
| 800 x 600 | 85 | 60 |
| 1024 x 768 | 85 | 60 |
| 1280 x 720 | 85 | 60 |
| 1280 x 768 | 85 | 60 |
| 1280 x 1024 | 85 | 60 |
| 1440 x 900 | 75 | 75 |
| 1600 x 1024 | 85 | 60 |
| 1600 x 1200 | 85 | 60 |
| 1680 x 1050 | 75 | 75-R |
| 1920 x 1080 | 85 | 60-R |
| 1920 x 1200 | 85 | 60-R |
| 1920 x 1440 | 85 | N/A |
| 2048 x 1536 | 75 | N/A |
| 2560 x 1440 | N/A | N/A |
| 2560 x 1600 | N/A | N/A |

## Technical Specifications - Graphics

### AMD Radeon HD 8490 1GB PCie x16 Graphics Card

| | |
|---|---|
| **Introduction** | Get impressive graphics and high resolution dual-display performance in a low profile, PCI Express x16 graphics add-in card based on the AMD Radeon HD 8490 Graphics Processor. Improve your everyday PC, Web conferencing, and video or photo editing. |
| **Form Factor** | PCie x16 |
| **Graphics Controller** | AMD Radeon HD 8490 |
| **Core Clock** | GPU engine operates at 875 MHz |
| **Memory** | 1GB, DDR3, SDRAM |
| **Memory Clock** | 900 MHz |
| **HDCP Support** | Yes |
| **Display Max. Resolution** | Digital 2560 x 1600<br>Analog 2048 x 1536 |

**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

| | Analog Connection | Digital Connection |
|---|---|---|
| 300 x 200 | 85 | 60 |
| 320 x 240 | 85 | 60 |
| 400 x 300 | 85 | 60 |
| 640 x 480 | 85 | 60 |
| 720 x 480 | 85 | 60 |
| 720 x 576 | 85 | 60 |
| 800 x 600 | 85 | 60 |
| 1024 x 768 | 85 | 60 |
| 1280 x 720 | 85 | 60 |
| 1280 x 768 | 85 | 60 |
| 1280 x 1024 | 85 | 60 |
| 1440 x 900 | 75 | 75 |
| 1600 x 900 | 85 | 60 |
| 1600 x 1024 | 85 | 60 |
| 1600 x 1200 | 85 | 60 |
| 1680 x 1050 | 75 | 75-R |
| 1920 x 1080 | 85 | 60-R |
| 1920 x 1200 | 85 | 60-R |
| 1920 x 1440 | 85 | N/A |
| 2048 x 1536 | 75 | N/A |
| 2560 x 1440 | N/A | 60 |
| 2560 x 1600 | N/A | 60 |

## 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 ProDesk 600 G1 Series Business PC 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 promoted HP to implement SMART IV technology which constantly checks that the data flow from host interface to media and media to host interface is not compromised. This is accomplished by inserting a 2 byte parity code into every 512 byte block in the data path of the hard drive's Cache RAM. This unique parity checking performed by HP's SMART IV technology hard drives, allows for more complete error detection coverage encompassing the entire data path between the host and the hard drive.

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

### Native Command Queuing

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

**NOTE:** GB = 1 billion bytes. Actual available capacity is less.

## Technical Specifications - Hard Disk and Solid State Storage

### Controller

|  | | SFF | | | TWR | |
| --- | --- | --- | --- | --- | --- | --- |
| Hard Drive Controller | These systems provide up to four serial ATA (SATA) interfaces that support transfer rates up to 6.0 Gb/s (for ports 0 and 1, 3 Gb/s on all others) and RAID data protection functionality. These systems can also support an external SATA (eSATA) device through an optional bracket/cable assembly. | | | | | |
| SATA Interfaces | 2 ea. SATA 3.0<br>1 ea. SATA 2.0 | | | 2 ea. SATA 3.0<br>2 ea. SATA 2.0 | | |
| Host SATA Controller | Advanced Host Controller Interface (AHCI) Revision 1.2. The specification includes a description of the hardware/software interface between system software and the host controller hardware. | | | | | |

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

| | |
| --- | --- |
| **Capacity** | 500,107,862,016 bytes |
| **Rotational Speed** | 7,200 rpm |
| **Drive Type** | Self-Encrypting Drive (SED) with SATA interface |
| **Interface** | SATA Interface conforming to Serial ATA International Organization: Serial ATA Revision 2.6 |
| **Segmented Buffer with write cache** | 32768 KB - A portion of buffer capacity used for firmware |
| **Number of Sectors** | 976,773,168 |
| **Seek Time (typical reads)** | Single Track: 1.0 ms<br>Average: 13 ms<br>Full-Stroke: 25 ms |
| **Media Diameter** | 2.5 in/63.5 mm |
| **Height** | 0.267 in/6.8 mm, ±0.2mm |
| Width | 2.75 in/69.85 mm, ±0.25mm |
| **Length** | 3.945 in/100.2 mm, ±0.25mm |
| **Weight** | 3.35 oz/95 g (max) |
| **Operating Temperature** | 32° to 140° F (0° to 60° C) |

Technical Specifications - Hard Disk and Solid State Storage

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

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

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

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

## Technical Specifications - Hard Disk and Solid State Storage

### HP 120 GB Solid State Drive

| | |
|---|---|
| **Unformatted Capacity** | 120 GB |
| **Architecture** | Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller |
| **Interface** | Serial ATA 2.0 (3.0 Gb/s) |
| **Dimensions (W x H x D)** | 2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm) |
| **Weight** | 0.18 lb (80 g) |

| | | |
|---|---|---|
| **Bandwidth Performance** | Sustained Sequential Read: | Up to 250 MB/s |
| | Sustained Sequential Write: | Up to 70 MB/s |
| | Random Read: | Up to 35K IOPs |
| | Random Write: | Up to 6.6K IOPs |
| **Latency** | Read: | 65-ms |
| | Write: | 85-ms |
| **Power** | DC power requirement: | 5 VDC 5%-100 mV ripple p-p |
| | Total power consumption: | 0.15W (active); 0.075W (idle) |
| **Useful Drive Life** | 35TB written, up to 20GB/day for 5 years | |
| **Environmental** (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 |

\* 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.

### HP 128 GB Solid State Drive

| | |
|---|---|
| **Unformatted Capacity** | 128 GB* |
| **Architecture** | Multi Level Cell (MLC) NAND |
| **Interface** | SATA 6 GB/sec |
| **Dimensions (W x H x D)** | 2.75 x 0.276 x 3.96 in (6.985 x 0.7 x 10.05 cm) |
| **Weight** | 0.16 lb (73 g) |

| | | |
|---|---|---|
| **Bandwidth Performance** | Sustained Sequential Read: | Up to 450 MB/ss |
| | Sustained Sequential Write: | Up to 260 MB/s |
| | Random Read (4KB): | up to 46K IOPs |
| | Random Write (4KB): | up to 56K IOPs |
| **Latency** | Read: | 55ms (TYP) |
| | Write: | 55ms (TYP) |
| **Power** | DC power requirement: | Min 4.5 V; Max 5.5 V |
| | Total power consumption: | 160 mW (Active) ; <85 mW; (Idle) |
| **Useful Drive Life** | 1.2 million device hours** | |

## Technical Specifications - Hard Disk and Solid State Storage

| | | |
|---|---|---|
| **Environmental** (all conditions, non-condensing) | Operating Temperature: | 32° to 158° F (0° to 70° C) |
| | Relative Humidity (operating): | 5% to 95% |
| | Shock: | 1,500 G/1.0 msec |
| **Regulations** | 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.

## HP 160 GB Solid State Drive

| | | |
|---|---|---|
| **Unformatted Capacity** | 160 GB\* | |
| **Architecture** | Multi Level Cell (MLC) NAND | |
| **Interface** | SATA 3 GB/sec | |
| **Dimensions (W x H x D)** | 2.74 x 0.37 x 4 in (6.98 x 0.95 x 10.2 cm) | |
| **Weight** | 0.18 lb (80 g) | |
| **Bandwidth Performance** | Sustained Sequential Read: | Up to 250 MB/s |
| | Sustained Sequential Write: | Up to 70 MB/s |
| | Random Read (4KB): | up to 35K IOPs |
| | Random Write (4KB): | up to 6.6K IOPs |
| **Latency** | Read: | 65 ms |
| | Write: | 85 ms |
| **Power** | DC power requirement: | 5 VDC 5%-100 mV ripple p-p |
| | Total power consumption: | 0.15 Watt (Active); 0.075 Watt (Idle) |
| **Useful Drive Life** | 35TB written, up to 20GB/day for 5 years \*\* | |
| **Environmental** (all conditions, non-condensing) | Operating Temperature: | 32° to 158° F (0° to 70° C) |
| | Relative Humidity (operating): | 5% to 95% |
| | Shock: | 1,500 G/1.0 msec |
| **Regulations** | 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

| | | |
|---|---|---|
| **Unformatted Capacity** | 256,186,209,271 bytes | |
| **Architecture** | Self-Encrypting (SED) Solid State Drive with 25nm MLC NAND Flash and SATA interface | |
| **Interface** | Serial ATA 2.0 (3.0 Gb/s) | |
| **NAND Flash** | 25nm MLC NAND Flash | |
| **Height** | .275 in/7mm | |
| **Width** | 2.75 in/69.85 mm | |
| **Length** | 3.95 in/100.5 mm | |
| **Weight** | 0.161 lb (73 g) | |
| **Bandwidth Performance** | Sustained Sequential 128k Read: | Up to 450 MB/ss |
| | Sustained Sequential 128k Write: | Up to 260 MB/s |
| | Random 4k Read: | up to 46K IOPs |
| | Random 4k Write: | up to 56K IOPs |
| **Latency** | Read: | 55 μs |
| | Write: | 55 μs |
| **Power** | SATA power consumption: | 160 mW (active average); <85 mW (idle average) |
| **Useful Drive Life** | 72TB written, up to 40GB/day for 5 years | |
| **Environmental** (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 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive

| | | |
|---|---|---|
| **Capacity** | 500,107,862,016 bytes | |
| **Rotational Speed** | 7,200 rpm | |
| **Interface** | Serial ATA 3.0 (6.0 Gb/s) | |
| **Buffer Size** | 16 MB | |
| **Logical Blocks** | 976,773,168 | |
| **Seek Time** (typical reads, includes controller overhead, including settling) | Single Track: | 2.0 ms |
| | Average: | 11 ms |
| | Full-Stroke: | 21 ms |
| **Height** (nominal) | 1 in/2.54 cm | |
| **Width** (nominal) | Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm | |
| **Operating Temperature** | 41° to 131° F (5° to 55° C) | |

## Technical Specifications - Hard Disk and Solid State Storage

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

| | | |
|---|---|---|
| **Capacity** | 1,000,204,886,016 bytes | |
| **Rotational Speed** | 7,200 rpm | |
| **Interface** | Serial ATA 3.0 (6.0 Gb/s) | |
| **Buffer Size** | 32 MB | |
| **Logical Blocks** | 1,953,525,168 | |
| **Seek Time** (typical reads, includes controller overhead, including settling) | Single Track: | 2.0 ms |
| | Average: | 11 ms |
| | Full-Stroke: | 21 ms |
| **Height** (nominal) | 1 in/2.54 cm | |
| **Width** (nominal) | Media diameter: 3.5 in/8.89 cm | |
| | Physical size: 4 in/10.2 cm | |
| **Operating Temperature** | 41° to 131° F (5° to 55° C) | |

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

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

## Technical Specifications - Removable Storage

### HP Slim SuperMulti DVD Writer Drive

| | | |
|---|---|---|
| **Height** | 12.7mm height | |
| **Orientation** | Either horizontal or vertical | |
| **Interface type** | SATA/ATAPI | |
| **Disc recording capacity** | Up to 8.5 GB DL or 4.7 GB standard | |
| **Dimensions** (W x H x D) | 5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm) | |
| **Weight** (max) | 0.42 lb (190 g) | |
| **Write speeds** | DVD-RAM | Up to 5X |
| | DVD-R DL | Up to 4X |
| | DVD+R | Up to 8X |
| | DVD+RW | Up to 4X |
| | DVD+R DL | Up to 4X |
| | DVD-R | Up to 8X |
| | DVD-RW | Up to 6X |
| | CD-R | Up to 24X |
| | CD-RW | Up to 16X |
| **Read speeds** | DVD-RAM | Up to 5X |
| | DVD-RW, DVD+RW | Up to 8X |
| | DVD-R DL, DVD+R DL | Up to 6X |
| | 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 |
| **Access time** (typical reads, including settling) | Random | DVD: < 140 ms (typical), CD: < 125 ms (typical) |
| | Full Stroke | DVD: < 250 ms (seek), CD: < 210 ms (seek) |
| | Stop Time | < 4 seconds |
| | Cache Buffer | 2 MB (minimum) |
| | Data Transfer Modes | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s - default) |
| | Source | Four-pin, DC power receptacle |

## Technical Specifications - Removable Storage

| | | |
|---|---|---|
| **Power** | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | | 12 VDC ± 5%-200 mV ripple p-p |
| | DC Current | 5 VDC (< 1000 mA typical, 1600 mA maximum) |
| | | 12 VDC (< 600 mA typical, 1400 mA maximum) |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| **Audio output** | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| **Environmental conditions** (operating - non-condensing) | Temperature | 41° to 122° F (5° to 50° C) |
| | Relative Humidity | 10% to 90% |
| | Maximum Wet Bulb Temperature | 86° F (30° C) |

## HP Slim Blu-ray BDXL Drive

| | |
|---|---|
| **Height** | 12.7mm Slim tray-load |
| **Orientation** | Either horizontal or vertical |
| **Interface type** | SATA/ATAPI |
| **Disc capacity** | Up to 128 GB QL, 100 GB TL, 50 GB DL or 25 GB standard SL |
| **Dimensions** W x H x D (max) | 5.04 x 0.5 x 5.0 in (128 x 12.7 x 127 mm) without bezel |
| **Weight** (max) | Up to 0.37 lb (170 g) without bezel |

| | | **Triple-layer** | **Quadruple-layer** |
|---|---|---|---|
| **Write speeds** | **BD-R** | Up to 4x | Up to 4x |
| | **BD-RE** | Up to 2x | Not supported |
| | | **Single-layer** | **Double-layer** |
| | **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 |
| | | **Triple-layer** | **Quadruple-layer** |

## Technical Specifications - Removable Storage

| | | | |
|---|---|---|---|
| | **BD-R** | Up to 4x | Up to 4x |
| | **BD-RE** | Up to 4x | Not supported |
| | | **Single-layer** | **Double-layer** |
| | **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 |
| **Read speeds** | **DVD-RW** | Up to 8x | Not supported |
| | **DVD+R** | Up to 8x | Up to 8x |
| | **DVD+RW** | Up to 8x | Not supported |
| | **BDMV (AACS Compliant Disc)** | Up to 6x/2x (Read/Play) | |
| | **DVD-RAM** | Up to 5x | |
| | **DVD-Video (CSS Compliant Disc)** | Up to 8x/4x (Read/Play) | |
| | **CD-R/RW/ROM** | Up to 24x | |
| | **CD-DA (DAE)** | Up to 20x/10x (Read/Play) | |
| **Access times** (typical reads, including setting) | **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) | |
| **Power** | **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 | |
| **Environmental** (all conditions non-condensing) | **Temperature** (operating) | 41° to 122° F (5° to 50° C) | |
| | **Relative Humidity** (operating) | 10% to 80% | |
| | **Maximum Wet Bulb Temperature** (operating) | 86° F (30° C) | |

Technical Specifications - Removable Storage

## HP Slim DVD-ROM Drive

| | | |
|---|---|---|
| **Height** | 12.7mm | |
| **Orientation** | Either horizontal or vertical | |
| **Interface type** | SATA/ATAPI | |
| **Dimensions** (W x H x D) | 5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm) | |
| **Weight** (max) | 0.42 lb (190 g) | |
| **Read speeds** | DVD+R/-R/+RW/ -RW/+R DL /-R DL | Up to 4X |
| | DVD-ROM | Up to 8X |
| | CD-ROM, CD-R | Up to 24X |
| | CD-RW | Up to 24X |
| **Access time** (typical reads, including settling) | Random DVD | DVD: < 140 ms (typical), CD: < 125 ms (typical) |
| | Random CD | DVD: < 250 ms (seek), CD: < 210 ms (seek) |
| | Data Transfer Modes | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s) |
| **Power** | Source | Four-pin, DC power receptacle |
| | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | DC Current | 5 VDC - <1000 mA typical, < 1600 mA maximum |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| **Audio output** | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| **Environmental** (all conditions non-condensing) | Temperature | 41° to 122° F (5° to 50° C) |
| | Relative Humidity | 5% to 85% |
| | Maximum Wet Bulb Temperature (operating) | 86° F (30° C) |

Technical Specifications – Memory

## System Memory Support

The HP ProDesk 600 G1 Business PC supports 4rd 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 or two DIMMs.

- Two channels of non-ECC DDR3 unbuffered dual in-line memory modules (UDIMM) or DDR3 unbuffered small outline dual in-line memory modules (SO-DIMM) with a maximum of two DIMMs 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
- Theoretical Maximum Memory Bandwidth:
  - 10.6 GB/s in single-channel mode of 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
  - 32 GB maximum memory support depending upon available number of DIMM sockets
- DDR3-1600 (PC3-12800) DIMMs are supported but limited to the 1333 MT/s data transfer rate when not configured with IvyBridge generation chipset.

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

## Memory Configurations: Small Form Factor / Towers

Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.

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

| Total Memory | Socket | | | |
|---|---|---|---|---|
| | Channel A (black) | | Channel B (black) | |
| | 1 (black) | 2 (white) | 3 (white) | 4 (white) |
| **4 GB (dual channel)** | 4 GB | unpopulated | 1 GB | unpopulated |
| **8 GB (dual channel)** | 4 GB | 2 GB | GB | GB |
| **16 GB (dual channel)** | 8 GB | 4 GB | 4 GB | 4 GB |

## Technical Specifications - Communications

### Intel® I1217LM GbE Network Connection (integrated)

| | |
|---|---|
| **Connector** | RJ-45 |
| **System Interface** | Integrated on PCA |
| **Controller** | Intel I217LM GbE platform LAN connect networking controller |
| **Memory** | 24 KB FIFO packet buffer memory |
| **Data rates supported** | 10/100/1000 Mbps |
| **IEEE Compliance** | 802.1P<br>802.1Q<br>802.2<br>802.3<br>802.3ab<br>802.3az<br>802.3u |
| **Bus architecture** | PCI Express and SMBus |
| **Data transfer mode** | PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state) |
| **Power requirement** | Requires 3.3V and 0.9V or just 3.3V with integrated regulators<br>Power consumption 0.733 Watts |
| **Boot ROM support** | Yes |
| **Network transfer mode** | Full-duplex<br>Half-duplex (not supported for the 1000BASE-T transceiver) |
| **Network transfer rate** | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps |
| **Environmental** | Operating Temperature: 0° to 85° C<br>Operating Humidity: 60% RH |
| **Management** | WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic |
| **Alerting** | ASF 2.0 support; AMT 9.0 support |

Technical Specifications - Communications

## Intel® Ethernet I210-T1 Gigabit Network Adapter

| | |
|---|---|
| **Connector** | RJ-45 |
| **System Interface** | PCI Express x1 |
| **Controller** | Intel® I210 Gigabit Ethernet Controller |
| **Memory** | Integrated Dual 48K configurable transmit receive FIFO Buffers |
| **Data rates supported** | 10/100/1000 Mbps |
| **IEEE Compliance** | 802.1P<br>802.1Q<br>802.2<br>802.3<br>802.3AB<br>802.3u<br>802.3x flow control |
| **Bus architecture** | PCI-E 2.1 |
| **Data path width** | X1, 250 MB/s, Bi-directional interface |
| **Data transfer mode** | Bus-master DMA |
| **Hardware certifications** | FCC, B, CE, TUV-c, TUVus Mark Canada and United States, TUV-GS Mark for European Union |
| **Power requirement** | Aux 3.3 V, 3.0 Watts in 1000 base-T and 1.0 Watts in 100 Base-T |
| **Boot ROM support** | Yes |
| **Network Transfer Rate** | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus) |
| **Environmental** | Operating Temperature: 32° to 131°F (0° to 55° C)<br>Operating Humidity: 85% at 131° F (55° C) |
| **Management** | WOL, PXE, DMI, WFM 2.0 |

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

| | |
|---|---|
| **Wireless LAN Standards** | IEEE 802.11a/b/g/n<br>IEEE 802.11 e, 802.11i, 802.11d, 802.11d, 802.11h |
| **Interoperability** | Wi-Fi certified (802.11 a/b/g/n WMM, WPA, WPA2 and WPS)<br>Tested with wireless access points from several major manufacturers<br>OS compatible with Microsoft Windows, Win7 and XP<br>Cisco Compatible Extensions Program compliant (802.11a/b/g only) with Microsoft Windows XP and Windows 7 |
| **Frequency Band** | 2.4 GHz and 5 GHz |
| **Antenna Structure** | 2 transmit; 2 receive (2x2) |

## Technical Specifications - Communications

| | |
|---|---|
| **Data Rates** | 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 802.11n specification |
| **Modulation** | Direct Sequence Spread Spectrum<br>DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM |
| **Security** | 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 products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows XP only. |
| **Sub-channels** | Multinational support with frequency bands and channels compliant to local regulations. |
| **Media Access Protocol** | CSMA/CA (Collision Avoidance) with ACK |
| **Network Architecture Models** | Ad-hoc (Peer to Peer)<br>Infrastructure (Access Point Required)<br>Intel® My Wifi Technology (iPAN) |
| **Roaming** | Provide seamless roaming between like access points (same frequency band) |
| **Output Power (for CCK)** | 15 dBm |
| **Output Power (for OFDM; power varies by data rate)** | 15 dBm |
| **Power Consumption** | 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) |
| **Power Management** | ACPI compliant power management<br>802.11 compliant power saving mode |
| **Antenna Connections** | 3 U.FL type connectors, 50 ohm nominal impedance |
| **Range** | 802.11 a - Typical (@6 Mbps) | 600 feet - Outdoor Open Area<br>150 feet - Indoor, Office environment |
| | 802.11 b - Typical (@1 Mbps) | 1200 feet - Outdoor Open Area<br>300 feet - Indoor, Office environment |
| | 802.11 g - Typical (@1 Mbps) | 1200 feet - Outdoor Open Area<br>300 feet - Indoor, Office environment |
| **Form Factors** | USDT: | MiniPCI-Express |
| | CMIT & SFF: | PCIe |
| **Weight** | 0.013 lb (4.0 g) |
| **Dimensions** | 1.1 x 1.2 in (26.8 x 30.0 mm) |
| **Operating Voltage** | 3.3V +/- 9%, 1.5V +/- 5% |
| **Temperature** | **Operating:**<br>**Non-operating:** | 32° to 176° F (0° to 80° C)<br>-40° to 176° F (-40° to 80° C) |
| **Humidity** | **Operating:**<br>**Non-operating:** | 10% to 90% (non-condensing)<br>5% to 90% (non-condensing) |

## Technical Specifications - Communications

| Configuration Utility | Microsoft Windows XP | Microsoft Windows Win 7 |
|---|---|---|
| | ● Microsoft Windows XP Wireless Network Connection Manager<br>● Intel PROSet for Microsoft Windows XP (required for Cisco Compatible Extensions support) | ● Intel IHV extensions for Win7 available to support Cisco Compatible Extensions |

## Technical Specifications - Audio

### High Definition Audio

| | |
|---|---|
| **Type** | Integrated |
| **HD Stereo Codec** | Realtek 2-channel ALC221 codec |
| **Audio I/O Ports** | Front microphone-In (150-K ohm Input Impedance) |
| | Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver) |
| | Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load) |
| | Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load)<br>Front Microphone/Headphone jack is re-task able to provide Microphone input, line-in or Headphone output to support connecting two headphones to the front of the system. When configured as a second front headphone output, both front headphone outputs are always driven with the same signal. |
| | All ports are 3.5mm |
| **Internal Speaker Amplifier** | 1.5W amplifier for the internal speaker only. External speakers must be powered externally. Rear Line-in audio port is re-taskable as either Line-in or Microphone-In. |
| **Multi-streaming Capable** | Multi-streaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks. |
| **Sampling** | 8 kHz - 192 kHz |
| **Wavetable Syntheses** | Yes – Uses OS soft wavetable |
| **Analog Audio** | Yes |
| **# of Channels on Line-Out** | Stereo (Left & Right channels) |
| **Internal Speaker** | Yes |
| **External Speaker Jack** | Yes |
| **Full Duplex** | Yes |

## Technical Specifications – Keyboards and Pointing Devices

### HP USB Keyboard

| | | |
|---|---|---|
| **Physical characteristics** | Keys | 104, 105, 106, 107, 109 layout (depending upon country) |
| | 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) |
| **Electrical** | Operating voltage | + 5VDC ± 5% |
| | Power consumption | 50-mA maximum (with three LEDs ON) |
| | System interface | USB Type A plug connector |
| | ESD | CE level 4, 15-kV air discharge |
| | EMI – RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft® PC 99 – 2001 | Functionally compliant |
| **Mechanical** | Keycaps | Low-profile design |
| | Switch actuation | 55-g nominal peak force with tactile feedback |
| | Switch life | 20 million keystrokes (using Hasco modified tester) |
| | Switch type | Contamination-resistant switch membrane |
| | Key-leveling mechanisms | For all double-wide and greater-length keys |
| | Cable length | 6 ft (1.8 m) |
| | Microsoft PC 99 – 2001 | Mechanically compliant |
| | Acoustics | 43-dBA maximum sound pressure level |
| **Environmental** | Operating temperature | 50° to 122° F (10° to 50° C) |
| | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | Operating shock | 40 g, six surfaces |
| | Non-operating shock | 80 g, six surfaces |
| | Operating vibration | 2-g peak acceleration |
| | Non-operating vibration | 4-g peak acceleration |
| | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | Drop (in box) | 30 in (76.2 cm) on concrete, 16-drop sequence |
| **Approvals** | | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC |
| **Ergonomic compliance** | | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, KC |

## Technical Specifications – Keyboards and Pointing Devices

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

## HP PS/2 Keyboard

| | | |
|---|---|---|
| | Keys | 104, 105, 106, 107, 109 layout (depending upon country) |
| **Physical Characteristics** | Dimensions (L x W x H) | 18.22 x 6.47 x 1.1 in (46.28 x 16.43 x 2.79 cm) |
| | Weight | 2 lb (0.9 kg) minimum |
| | Operating voltage | + 5VDC ± 5% |
| | Power consumption | 50-mA maximum (with three LEDs ON) |
| **Electrical** | 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 |
| | Keycaps | Low-profile design |
| | Switch actuation | 55-g nominal peak force with tactile feedback |
| | Switch life | 20 million keystrokes (using Hasco modified tester) |
| **Mechanical** | 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 149° F (-30° to 65° C) |
| | Operating humidity | 15% to 80% (non-condensing at ambient) |
| | Non-operating humidity | 15% to 90% (non-condensing at ambient) |
| | Operating shock | N/A |
| **Environmental** | 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 |

## Technical Specifications – Keyboards and Pointing Devices

| | | |
|---|---|---|
| | 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 |
| **Approvals** | CUL, ICES-003 Class B, FCC, CE Mark,TUV GS, VCCI, BSMI, C-Tick, KC | |
| **Ergonomic compliance** | ANSI HFS 100, ISO 9241-4, and TUVGS | |

## HP USB Smart Card (CCID) Keyboard

**Key Benefits:**

- 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

| | | |
|---|---|---|
| **Physical Characteristics** | Keys | 104, 105, 106, 107, 109 layout (depending upon country |
| | Form factor | USB basic smart card keyboard |
| | Colors | Carbonite/Silver |
| | Dimensions (H x W x D) | 18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm) |
| | Weight | 2 lb (0.9 kg) minimum |
| **Electrical** | Operating voltage | + 5VDC ± 5% |
| | Power consumption | 100-mA maximum (with four LEDs ON) |
| | System interface | USB Type A plug connector |
| | ESD | CE level 4, 15-kV air discharge |
| | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft PC 99 - 2001 | Functionally compliant |
| | Languages | 30+ available |
| | Keycaps | Standard design |
| | Switch actuation | 55 g nominal peak force with tactile feedback |
| **Mechanical** | 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

| | | | |
|---|---|---|---|
| **Environmental** | Non-operating temperature | -22° to 140° F (-30° to 60° C) | |
| | Operating humidity | 10% to 90% (non-condensing at ambient) | |
| | Non-operating humidity | 20% to 80% (non-condensing at ambient) | |
| | Operating shock | 40 g, six surfaces | |
| | Non-operating shock | 80 g, six surfaces | |
| | Operating vibration | 2-g peak acceleration | |
| | Non-operating vibration | 4-g peak acceleration | |
| | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence | |
| | Drop (in box) | 42 in (107 cm) on concrete, 16-drop sequence | |
| **SmartCard Function** | Support | All ISO 7816 smart cards | |
| | Interface | Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1) | |
| | Chipset | SCM 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 | |
| | 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 |
| **Approvals** | CE-Mark, UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC, EMV2000, USB-IF | | |
| **Ergonomic Compliance** | ISO 9241-4, TUVGS | | |
| **Kit Contents** | Keyboard, I/O Security and Documentation CD, warranty card | | |

## HP USB PS/2 Washable Keyboard

| | | |
|---|---|---|
| **Physical Characteristics** | Keys | 104 (US) layout or 105 (EU) layout – depending upon country |
| | 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% |

## Technical Specifications – Keyboards and Pointing Devices

| | | |
|---|---|---|
| **Electrical** | Power consumption | 50-mA maximum (with three LEDs ON) |
| | System interface | USB Type A plug connector |
| | ESD | CE level 4, 15-kV air discharge |
| | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft® PC 99 - 2001 | Functionally compliant |
| **Mechanical** | Keycaps | Stepped -profile design |
| | Switch actuation | 55-g nominal peak force with tactile feedback |
| | 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 |
| **Environmental** | Operating temperature | 50° to 122° F (10° to 50° C) |
| | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | Operating humidity | 10% to 95% (non-condensing at ambient) |
| | Non-operating humidity | 0% to 95% (non-condensing at ambient) |
| | Operating shock | 40 g, six surfaces |
| | Non-operating shock | 80 g, six surfaces |
| | Operating vibration | 2-g peak acceleration |
| | Non-operating vibration | 4-g peak acceleration |
| | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | Drop (in box) | 42 in (107 cm) on concrete, 16-drop sequence |
| **Operating system support** | Windows® 7, Windows Vista, Windows XP Professional | |
| **Approvals** | UL, cUL, FCC, CE, TUV GS, VCCI, BSMI, C-Tick, KCC, USB-IF, WHQL, EN/IEC 60601-1, IP66/NEMA4X | |
| **Ergonomic compliance** | ANSI HFS 100, ISO 9241-4, and TUVGS | |

## Technical Specifications – Keyboards and Pointing Devices

### HP Wireless Keyboard and Mouse

| | | |
|---|---|---|
| **Keyboard** | 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) |
| **Mouse** | 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) |
| **Receiver** | Dimensions (H x L x W) | 0.33 x 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) |

| | |
|---|---|
| **System Requirements** | 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<br>Available USB port for the receiver<br>CD-ROM Drive<br><br>*This system may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details. |

| | | |
|---|---|---|
| **Approvals** | 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. |

## Technical Specifications – Keyboards and Pointing Devices

### HP PS/2 Mouse

| | | |
|---|---|---|
| **Dimensions** (H x L x W) | 1.46 x 2.48 x 4.53 in (3.70 x 6.29 x 11.50 cm) | |
| **Weight** | 3.53 oz (100g; +10g/- 5 g) | |
| **Environmental** | Operating temperature | -32° to 104°F (0° to 40° C) |
| | Non-operating temperature | -4° to 140°F (-20° to 60° C) |
| | Operating humidity | 10% to 90%<br>(non condensing at ambient) |
| | Non-operating humidity | 10% to 90%<br>(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<br>(out of box) | 80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face |
| **Electrical** | Operating voltage | 5 VDC ± 10% |
| | Power consumption | 100mA |
| | System consumption | PS/2 mini-din connector |
| | ESD | CE level 4, 15 kV air discharge |
| | EMI-RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft PC99 - 2001 | Functionally compliant |
| **Mechanical** | Resolution | 800 DPI |
| | Tracking speed | 10 in/s (25.4 cm/s) maximum |
| | Acceleration | ±15% |
| | Switch actuation | 65±20 gf |
| | 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 |

## Technical Specifications – Keyboards and Pointing Devices

| | | |
|---|---|---|
| **Scroll wheel** | Maximum rotation force | 50 gf-cm |
| | Switch type | Light force micro-switch |
| | Switch life | 1 million operations |
| | Mechanical life | Minimum 200,000 revolutions |
| **Regulatory Approvals** | UL/cUL, FCC, CE Mark, TUV/GS, VCCI, KCC, BSMI, C-Tick | |

## HP USB Mouse

| | |
|---|---|
| **Dimensions** (H x L x W) | 1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm) |
| **Weight** | 0.22 lb (0.10 kg) |
| **Cable length** | 70.9 in (180 cm) |
| **System requirements** | Available USB port |

## HP USB 1000dpi Laser Mouse

| | | |
|---|---|---|
| **Dimensions** (H x L x W) | 1.47 x 4.53 x 2.47 in (37.3 x 114.97 x 62.86 mm) | |
| **Weight** | 3.360 oz (102g) | |
| **Cable length** | 70.9 in (180 cm) | |
| **System requirements** | Available USB port | |
| **Environmental** | Operating Temperature | 32° to 104° F (0° to 40° C) |
| | Non-operating Temperature | -4° to 140° F (-20° to 60° C) |
| | Operating Humidity | 10% to 90% (non-condensing at ambient) |
| **Mechanical** | Resolution | 1000dpi |
| | Tracking Speed | 45 cm/sec |
| | Cable Length | 70.9 in (180 cm) |

## Technical Specifications – Keyboards and Pointing Devices

### HP USB PS/2 Washable Mouse

| | | |
|---|---|---|
| **Dimensions** (H x L x W) | 1.56 x 2.44 x 4.61 in (3.95 x 6.21 x 11.7 cm) | |
| **Weight** | 4.44 oz (126 g) | |
| **Environmental** | Operating temperature | −32° to 104°F (0° to 40° C) |
| | Non-operating temperature | −4° to 140°F (−20° to 60° C) |
| | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | Non-operating humidity | 10% to 90% non-condensing |
| | Operating shock | 40 g, 6 surfaces |
| | Non-operating shock | 80 g, 6 surfaces |
| | Operating vibration | 2 g peak acceleration |
| | Non-operating vibration | 4 g peak acceleration |
| | Drop (out of box) | 80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face |
| **Electrical** | Operating voltage | 5 VDC ± 10% |
| | Power consumption | 100mA |
| | System consumption | PS/2 mini-din connector or USB |
| | ESD | CE level 2 8 kV air discharge |
| | EMI-RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft® PC99 – 2001 | Functionally compliant |
| **Mechanical** | Resolution | 1000 ± 20% DPI |
| | Tracking speed | 14 in/s ( 35.56 cm/s) maximum |
| | Acceleration | 2 g |
| | Switch actuation | 70 g nominal peak force |
| | Switch life | 3,000,000 operations (using Hasco modified tester) |
| | Switch type | Low force micro-switches |
| | Cable length | 8.8 ft total 70 cm+ 2m extension |
| | Microsoft PC99 – 2001 | Mechanically compliant |
| **Scroll wheel** | Width | 6 mm |
| | Diameter | 1 in (25.4 mm) |
| | Maximum rotation speed | 48 rats/sec |
| | Switch type | Light force micro-switch |
| | Switch life | 3 million operations |
| | Mechanical life | Minimum 200,000 revolutions |
| **Regulatory approvals** | Compliant | FCC, CE Mark, ICES-003-B, IP66/NEMA4X |

Technical Specifications – Power

## Unit Environment and Operating Conditions

General Unit Operating Guidelines

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

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

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

## Power Supply

| | SFF | TWR |
|---|---|---|
| Standard Efficiency | 240W active PFC | 320W active PFC |
| High Efficiency* | 240W active PFC<br>87/90/87% efficient at 20/50/100% load<br>240W active PFC<br>90/92/89% efficient at 20/50/100% load | 320W active PFC<br>87/90/87% efficient at 20/50/100% load<br>320W active PFC<br>90/92/89% efficient at 20/50/100% load |
| Operating Voltage Range | 90 - 264 VAC | 90 - 264 VAC |
| Rated Voltage Range | 100 - 240 VAC | 100 - 240 VAC |
| Rated Line Frequency | 50/60 Hz | 50/60 Hz |
| Operating Line Frequency   Range | 47 – 63 Hz | 47 – 63 Hz |
| Rated Input Current | 4A | 5.5A |
| Rated Input Current with   Energy Efficient* Power Supply | 4A | 5.5A |
| Current Leakage<br>(NFPA 99) | < 275 µA | <450=>275uA |
| Power Supply Fan | 92=>70mm variable speed | 92mm variable speed |
| Power cord length | 6.0 ft. (1.83 m) | 6.0 ft. (1.83 m) |
| External Power Adapter | | |
| Dimensions | N/A | N/A |
| Total Cord Length | N/A | N/A |

## Technical Specifications – Power

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

Technical Specifications – Weights & Dimensions

## Weights & Dimensions
(configured with 1 HDD & 1 ODD)

| | SFF | TWR |
|---|---|---|
| **Chassis (W x H x D)** | 13.3 x 3.95 x 14.9 in<br>338 x 100 x 379 mm | 6.7 x 15.7 x 17.4 in<br>170 x 399 x 442 mm |
| **System Volume** | 782.7 cu in<br>12.8 L | 1828 cu in<br>30 L |
| **System Weight\*** | 16.7 lb<br>7.6 kg | 20.5 lb<br>9.3 kg |
| **Max Supported Weight (desktop orientation)** | 77.0 lb<br>35.0 kg | N/A |
| **Tower Stand (H x W x D)** | 1.1 x 7.0 x 7.9 in<br>29 x 178 x 200 mm | N/A |
| **Packaging (H x W x D)** | 9.0 x 19.7 x 23.4 in<br>229 x 500 x 594 mm | 11.6 x 19.7 x 23.2 in<br>295 x 500 x 590 mm |
| **Shipping Weight\*** | 17.9 lb<br>8.1 kg | 28.8 lb<br>13.1 kg |
| **Palletization Profile** | 4-units per layer<br>10-layer max.<br>40-units per pallet | 4-units per layer<br>8-layer max.<br>32-units per pallet |

## Technical Specifications – Miscellaneous Features

### Management Features

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

### Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 2-second pause, then repeats:
    - 2 - processor thermal protection activated
    - 3 - processor not installed
    - 4 - power supply failure
    - 5 -- memory error
    - 6 - video error
    - 7 - PCA failure (ROM detected failure prior to video)
    - 8 - invalid ROM, bootblock recovery mode
    - 9 - system not fetching code
    - 10 - system hang while loading an option ROM
- HP PC Hardware Diagnostics UEFI:
  - This utility enables hardware level testing outside the operating system on many components. The diagnostics can be invoked by pressing F2 at POST, and is available as a download from HP Support
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacemen
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Green Pull Tabs, and Quick Release Latches for easy Identification

# QuickSpecs

## Technical Specifications – Miscellaneous Features

### Additional Features

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

# QuickSpecs

## Options and Accessories (sold separately)

| Communication Devices | SFF/TWR | Part Number |
|---|---|---|
| Intel Ethernet I210 - T1 Gbe NIC | X | E0X95AA |
| Intel 6205 802.11 a/b/g/n PCIe x1 NIC | X | E0X93AA |

**Note:** The use of any of these optional NIC Cards (wired or wireless) will disable the Intel vPro Technology features.

| Graphics Solutions | SFF/TWR | Part Number |
|---|---|---|
| AMD Radeon HD 8350 Graphics (PCIe x16) | X | E1C63AA |
| AMD Radeon HD 8490 Graphics Card | X | E1C64AA |
| Nvidia NVS 310 Graphics (PCIe x16) | X | A7U59AA |
| Nvidia NVS 315 Graphics (PCIe x16) | X | E1C65AA |
| HP DisplayPort Cable Kit | X | VN567AA |
| HP DisplayPort To Dual Link DVI-D Adapter | X | NR078AA |
| HP DisplayPort To DVI-D Adapter | X | FH973AA |
| HP DisplayPort to HDMI Adapter | X | BP937AA |
| HP DisplayPort to VGA Adapter | X | AS615AA |
| HP DMS-59 to Dual DVI Cable | X | DL139A |
| HP DMS-59 to Dual DisplayPort Adapter | X | XP688AA |

| Data Storage Drives and Accessories | SFF/TWR | Part Number |
|---|---|---|
| HP 500-GB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive | X | QK554AA |
| HP 1-TB 7.2K rpm SATA 6.0Gb/s 3.5" Hard Disk Drive | X | QK555AA |
| HP 128-GB SATA 3.0Gb/s Solid State Drive | X | QV063AA |
| HP 160-GB SATA 3.0Gb/s Solid State Drive | X | QV064AA* |
| HP 500-GB SATA 3.0Gb/s Solid State Hybrid Drive | X | E1C62AA |
| HP Slim Removable SATA Hard Drive Enclosure (frame & carrier) | X | C1N41AA |
| HP Slim Removable SATA Hard Drive Enclosure (carrier only) | X | E3F39AA |
| HP Chassis (1bay) Security Kit | TWR only | AR639AA |

*Not available in all regions.

## Options and Accessories (sold separately)

### Input Devices

| | SFF/TWR | Part Number |
|---|---|---|
| HP USB Keyboard | X | QY776AA |
| HP USB Gray Keyboard | X | B6B64AA |
| HP USB Smart Card (CCID) Keyboard | X | BV813AA |
| HP USB Keyboard and Mouse Kit | X | B1T09AA |
| HP USB Washable Keyboard | X | VF097AA |
| HP USB and PS/2 Washable Mouse | X | BM866AA |
| HP USB and PS/2 Washable Keyboard and Mouse Kit | X | BU207AA |
| HP PS/2 Mouse | X | QY775AA |
| HP USB Mouse | X | QY777AA |
| HP USB 1000dpi Laser Mouse | X | QY778AA |
| HP Wireless Keyboard and Mouse Combination | X | QY449AA |

### System Memory

| | SFF/TWR | Part Number |
|---|---|---|
| HP 4GB DDR3-1600 (PC3-12800) DIMM | X | B4U36AA |
| HP 8GB DDR3-1600 (PC3-12800) DIMM | X | BU37AA |

### Multimedia Devices

| | SFF/TWR | Part Number |
|---|---|---|
| HP Slim DVD-ROM Drive | X | VP033AA |
| HP Slim SuperMulti DVD Writer Drive | X | QS209AA |
| HP USB HD 720P v2 Business Webcam | X | D8Z08AA |
| HP Business Headset | X | QK550AA |

### Removable Media Storage

| | SFF/TWR | Part Number |
|---|---|---|
| HP 14-in-1 Media Card Reader (available Dec. 2013) | X | TBD |

### Security Devices

| | SFF/TWR | Part Number |
|---|---|---|
| HP Solenoid Lock and Hood Sensor (SFF) | SFF only | E0X97AA |
| HP Solenoid Lock and Hood Sensor (TWR) | TWR only | E0X96AA |
| HP SFF Wall Mount/Security Sleeve | SFF only | VN570AA |
| HP UltraSlim Cable Lock | X | H4D73AA |

## Options and Accessories (sold separately)

### Stands and Accessories

| | SFF/TWR | Part Number |
|---|---|---|
| HP Integrated Work Center Stand (SFF) | SFF only | QP897AA |
| HP SFF Tower Stand | SFF only | VN569AA |
| HP 600/800 Tower Bezel Kit | TWR only | E1C66AA |
| HP 800/600 SFF Bezel Kit | SFF only | E3F27AA |
| HP Serial Port Adapter (RS-232 compatible) | X | PA716A |
| HP Parallel Port Kit | X | KD061AA |

### LANDesk Software (E-Delivery)

| | Part Number |
|---|---|
| LANDesk Management Suite License - 1-499 Nodes E-Delivery | QY369AAE |
| LANDesk Management Suite License - 500-999 Nodes E-Delivery | QY370AAE |
| LANDesk Management Suite License - 1000-1999 Nodes E-Delivery | QY371AAE |
| LANDesk Management Suite License - 2000-4999 Nodes E-Delivery | QY372AAE |
| LANDesk Management Suite License - 5000-9999 Nodes E-Delivery | QY373AAE |
| LANDesk Security Suite License E-Delivery | QY379AAE |
| LANDesk Management Suite 1 Year Maintenance - 1-499 Nodes E-Delivery | HZ825AAE |
| LANDesk Management Suite 1 Year Maintenance - 500-999 Nodes E-Delivery | HZ826AAE |
| LANDesk Management Suite 1 Year Maintenance - 1000-1999 Nodes E-Delivery | HZ827AAE |
| LANDesk Management Suite 1 Year Maintenance - 2000-4999 Nodes E-Delivery | HZ828AAE |
| LANDesk Management Suite 1 Year Maintenance - 5000-9999 Nodes E-Delivery | HZ829AAE |
| LANDesk Security Suite 1 Year Subscription | HZ830AAE |
| LANDesk Patch Management 1 Year Subscription - 1-499 Nodes E-Delivery | HZ831AAE |
| LANDesk Patch Management 1 Year Subscription - 500-999 Nodes E-Delivery | HZ832AAE |
| LANDesk Patch Management 1 Year Subscription - 1000-1999 Nodes E-Delivery | HZ833AAE |
| LANDesk Patch Management 1 Year Subscription - 2000-4999 Nodes E-Delivery | HZ834AAE |
| LANDeskPatch Management 1 Year Subscription - 5000-9999 Nodes E-Delivery | HZ835AAE |