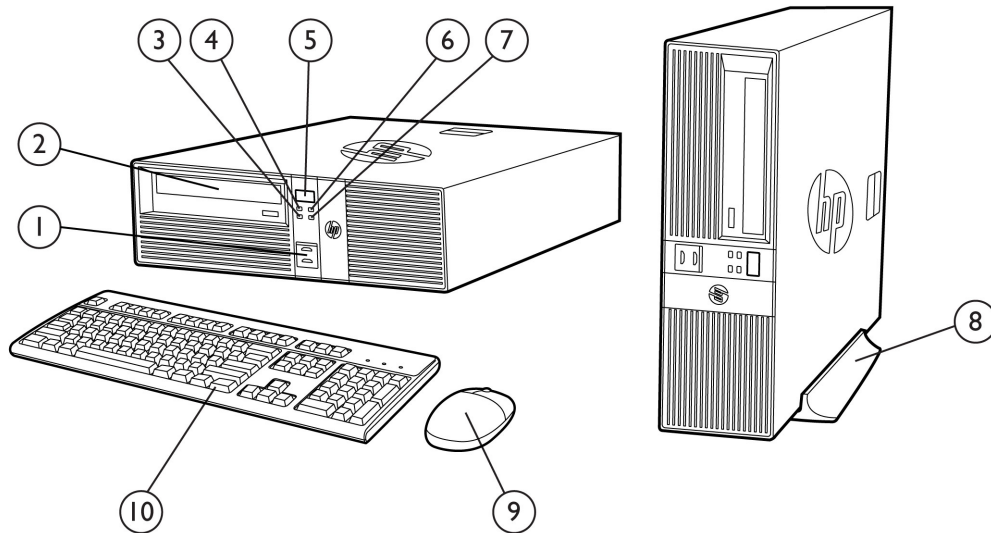
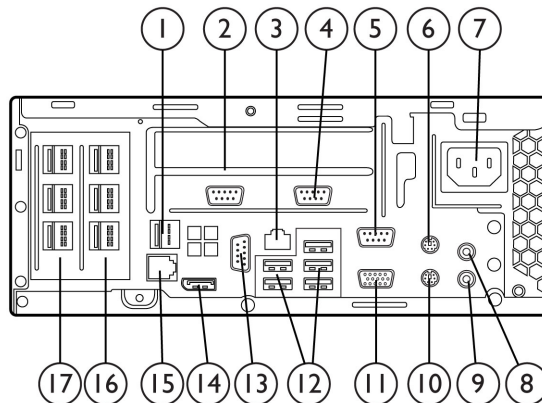


## Overview



- |                                      |  |
|--------------------------------------|--|
| 1. 2 USB 2.0 ports with sliding door | 6. Hard Drive LED                              |
| 2. 5.25" external optical drive      | 7. NIC activity indicator LED                  |
| 3. NIC link indicator LED            | 8. Stand for vertical configuration (optional) |
| 4. Power/ Diagnostic LED             | 9. HP 2-button scroll mouse-(optional)         |
| 5. Power button                      | 10. HP Standard keyboard (optional)            |



- |   |                        |
|---|------------------------|
| 1. 24 Volt USB + PWR port   | 10. PS/2 keyboard port |
| 2. Two (2) Full-Height Slots*. Can be configured either as two (2) PCI or two (2) PCIe x1 Full-Height slots. Shown is optional 2 Port RS232 serial (power configurable) Card, COM4 port (left) and COM3 port (right port) |                        |



### Overview

- |  |   |
|--|---|
| 3. RJ-45 LAN jack  | 11. VGA port  |
| 4. RS232 serial COM3 (as described in item 2)                      | 12. 5 USB 2.0 ports   |
| 5. RS232 serial (power configurable) COM1 port                     | 13. RS232 serial (power configurable) COM2 port                                       |
| 6. PS/2 mouse port   | 14. Display Port  |
| 7. 240W EPA – Active PFC power supply (no line switching required) | 15. RJ12 cash drawer port   |
| 8. Line in audio jack  | 16. One (1) PCIe x16 Slot* – shown is optional three (3) port 12 Volt USB +Power Card |
| 9. Line out audio jack   | 17. One (1) PCIe x1 Slot* (shown is optional three (3) port 12 Volt USB + Power Card) |

\* **NOTE:** A variety of cards are available to populate slots, dependant on riser choice and connectors utilized. For full details, please contact your HP sales representative for configuration choices.

### At A Glance

- UEFI BIOS developed and engineered by HP for better security, manageability and software image stability
- Intel Q67 Express chipset supporting Intel 2nd generation Core processors, featuring Intel HD Graphics and vPro Technology (available with select processors)
- One of the following operating systems:
  - Genuine Windows 7 Professional 32-bit
  - Genuine Windows 7 Professional 64-bit
  - Genuine Microsoft Windows Embedded POSReady 2009
  - FreeDOS
- Intel 82579LM GbE integrated network connection
- DDR3 Synchronous Dynamic Random Access Memory (SDRAM)
- Integrated dual independent monitor support via VGA and digital DisplayPort v1.1a video interfaces
- Discrete graphics options available
- 90% high efficiency energy saving power supply
- ENERGY STAR 5.0 qualified models available (dependent upon the desired configuration)
- Can be configured with multiple hard disk drives in a RAID array
- Industry leading Design for Environment standards
- Protected by HP Services, including standard 3-3-3 warranty and warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply)
- Tool-less serviceability features for easier upgrades and repairs
- 40C ambient thermals standard. Optional 50C thermal configuration available.
- Optional HP Rear Port/Cable Control Cover Available
- Point of Sale I/O ports including cash drawer port.
  - Configurable Full-Height expansion slots Must choose either a PCI Riser or PCIe Riser. The choice of riser will affect which cards can be utilized.
  - Either the PCI Riser or the PCIe Riser contain a Serial Port Connector, and if this connector is populated by a Serial Card then one of the riser bays is covered and cannot be used

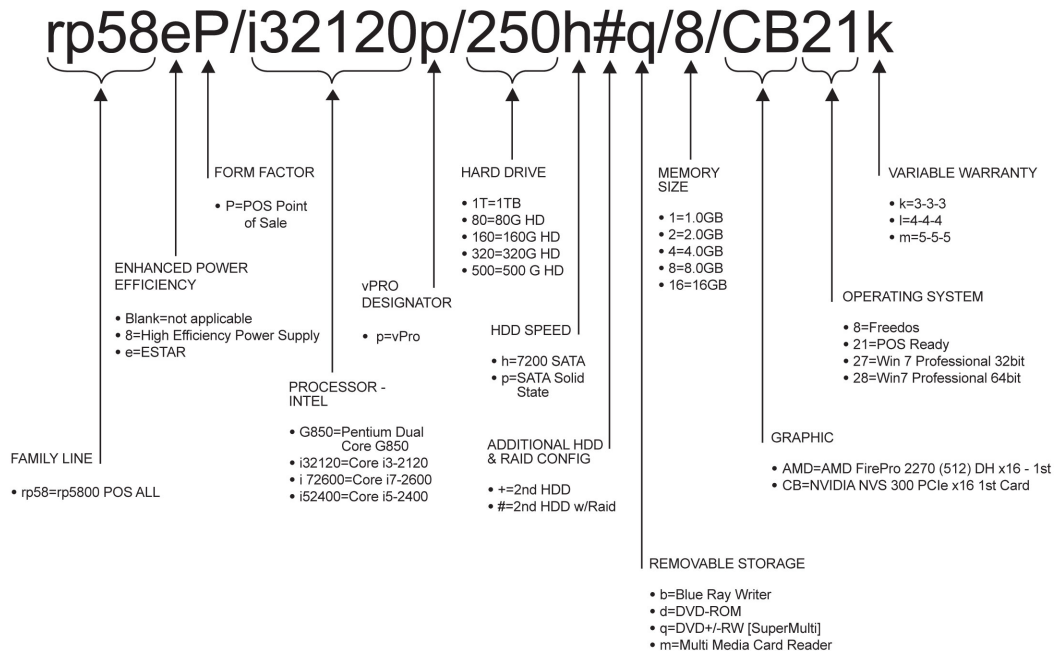
NOTE: All models and features may not be available in all countries



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

### Model Key and Example

**NOTE:** This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.



### Operating Systems

#### Preinstalled

Genuine Windows 7 Professional Edition (32-bit or 64-bit)  
Genuine Microsoft Windows Embedded POSReady 2009  
FreeDOS

#### Supported

Genuine Windows Vista Enterprise Edition\*\*  
Genuine Windows XP Professional Edition (32-bit)  
Genuine Windows 7 Enterprise Edition\*  
Novell SUSE Linux Enterprise Desktop 11†

#### Certified

Novell SUSE Linux Enterprise Desktop†

\* 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.

\*\* Certain Windows Vista product features require advanced or additional hardware. See: <http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx> and:



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

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

† The following features are not supported by Novell SUSE Linux Enterprise Desktop:

- Intel Gigabit CT Desktop NIC
- Broadcom NetXtreme Gigabit Ethernet Plus
- HP ProtectTools
- 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

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### Value Added Software (included with all models; not included when configured with FreeDOS)

|                                |                                |
|--------------------------------|--------------------------------|
| HP ProtectTools Security Suite | HP Vision Diagnostics          |
| HP Software Management Agent   | PDF Complete Corporate Edition |
| Computrace for Desktops agent  | Microsoft Office 2010 Starter  |

---

### Value Added Software (included with select models; not included when configured with FreeDOS)

|  |                        |
|--|------------------------|
| HP Power Assistant v2.0                    | Roxio Creator Business |
| Computer Setup Utility                     | Corel WinDVD           |
| Norton Internet Security 2011 <sup>1</sup> |                        |

<sup>1</sup> 60 day trial period for Norton Internet Security 2011 software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.

---

### HP Client Management Solutions (available for free download from the Internet)

<http://www.hp.com/go/easydeploy>

|                                     |                              |
|-------------------------------------|------------------------------|
| HP SoftPaq Download Manager         | HP Systems Software Manager  |
| HP Client Catalog for Microsoft SMS | HP Client Automation Starter |

---

### Retail Solutions Services and Features

|   |   |
|---|---|
| Intel® Stable Image Platform Program (SIPP) | Factory Express Deployment and Lifecycle Services |
| Intel® vPro™ Technology                     | Intel® Standard Manageability                     |
| HP Global Series Services                   | Trusted Platform Module (TPM) v1.2 <sup>1</sup>   |

<sup>1</sup> TPM module disabled where restricted by law, i.e. Russia.



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

### Service and Support

On-site warranty and service<sup>1</sup>: This limited warranty and service offering delivers parts, labor and on-site repair for terms up to 5 years. Response time is next business day<sup>2</sup> and includes free telephone support<sup>3</sup> 24 x 7. Global coverage<sup>2</sup> ensures any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor.

<sup>1</sup> Terms and conditions may vary by country. Certain restrictions and exclusions apply

<sup>2</sup> On-site services 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

<sup>3</sup> Technical telephone support applies only to HP configured, HP and HP qualified third party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

### Chipset

Intel® Q67 Express

### Processor

#### Intel® 2<sup>nd</sup> Generation Core™ i3 Processors

Intel Core i3-2120 Processor

3.30 GHz, 3M cache, 2 cores/4 threads

#### Intel® 2<sup>nd</sup> Generation Core™ i5 Processors

Intel Core i5-2400 Processor

3.10 GHz, 6M cache, 4 cores/4 threads

Intel Stable Image Platform Program (SIPP)

Supports Intel vPro Technology

#### Intel® 2<sup>nd</sup> Generation Core™ i7 Processors

Intel Core i7-2600 Processor

3.40 GHz, 8M cache, 4 cores/8 threads

Intel Stable Image Platform Program (SIPP)

Supports Intel vPro Technology

#### Intel® Pentium® Dual-Core Processors (Available after launch, TBD)

Intel® Pentium® Dual-Core G850 Processor

2.90 GHz, 3 MB cache, 2 cores

### Intel® vPro™ Technology

HP rp5800 Retail Systems featuring this technology include processors that are part of the Intel 2011 Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the HP rp5800 Retail System, thus making this model the most stable, secure, and manageable platforms available to retailers today.

**Intel Advanced Management Technology (AMT) v7.0** – An advanced set of remote management features and functionality which provides network administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 7.0 includes the following advanced management functions:



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

- Power Management (on, off, reset)
- Hardware Inventory (includes BIOS and firmware revisions)
- Hardware Alerting
- Agent Presence
- System Defense Filters
- SOL/IDER
- Cisco NAC/SDN Support
- ME Wake-on-LAN
- DASH 1.1 compliance
- IPv6 Support
- Fast Call for Help - a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection
- Remote Scheduled Maintenance - pre-schedule when the Retail System connects to the IT or service provider console for maintenance. Remote Retail Systems can get required patches, be inventoried, etc by connecting to their IT console or Service Provider when it's convenient
- Remote Alerts – automatically alert IT or service provider if issues arise
- Access Monitor – Provides oversight into Intel® AMT actions to support security requirements
- PC Alarm Clock
- Microsoft NAP Support
- Host Base set-up and configuration
- Management Engine (ME) firmware roll back
- Wireless AMT functionality on Point of Sale/Desktop (WoDT)
- Enhanced KVM resolution

### Redundant Array of Independent Drives (RAID)

Flexible implementation:

- DriveLock is supported while in RAID mode. Users can manage the DriveLock password from within F10 Setup. Locked drives will be displayed as such in the RAID option ROM interface.
- Hard drive information can be viewed within F10 Setup while in RAID mode. Previously, the hard drives will not appear in Drive Configuration when switching to RAID mode.
- DPS Self Test can be executed on physical hard drives while in RAID mode.
- The RAID Setup Utility (accessed through CTRL-I) can be protected by the F10 Setup password.

#### NOTE:

RAID 1 is the only RAID configuration offered via factory configurations. The pre-configured systems:

- are complete RAID systems and have both drives installed.
- have the necessary Option ROM configuration.
- are pre-loaded and pre-installed with all required Intel software.
- include a preinstalled operating system that is mirrored mode out of the box.

Please refer to the HP White Paper titled “Advanced Host Controller Interface (AHCI) and Redundant Array of Independent Disks (RAID) on HP Compaq PCs” at: <http://www.hp.com> for more information and instructions.



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

## DDR3 Synchronous DRAM NON-ECC System Memory

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The HP rp5800 Retail System supports non-ECC DDR3 PC3-10600 (1333 MHz) and PC3-8500 (1066 MHz) memory.

**CAUTION:** You must shut down the Retail System 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 Retail System 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:

### Maximum Memory

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

### NOTE:

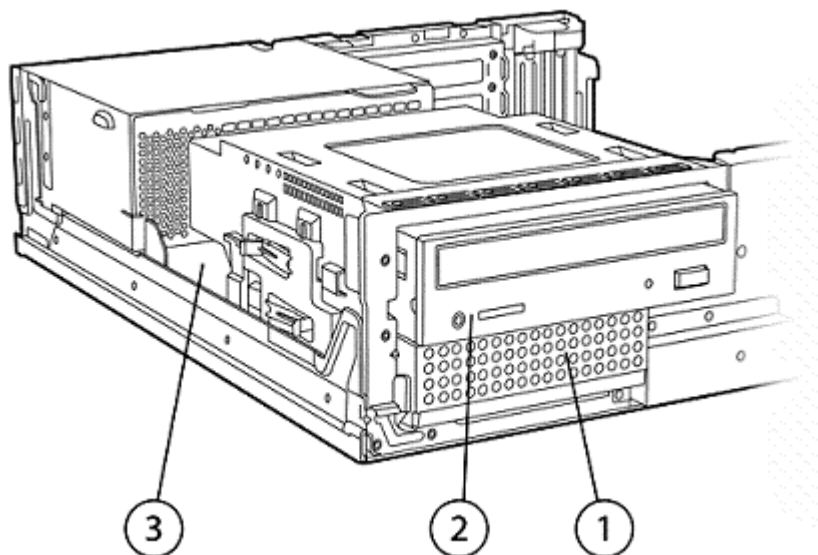
For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

| Total Memory                      | Slot      |           |           |           |
|-----------------------------------|-----------|-----------|-----------|-----------|
|                                   | Channel A |           | Channel B |           |
|                                   | 1 (black) | 2 (white) | 3 (white) | 4 (white) |
| 1 GB                              | 1 GB      |           |           |           |
| 2 GB<br>(dual channel symmetric)  | 1 GB      |           | 1 GB      |           |
| 4 GB<br>(dual channel symmetric)  | 1 GB      | 1 GB      | 1 GB      | 1 GB      |
| 8 GB<br>(dual channel symmetric)  | 2 GB      | 2 GB      | 2 GB      | 2 GB      |
| 16 GB<br>(dual channel symmetric) | 4 GB      | 4 GB      | 4 GB      | 4 GB      |

**NOTE:** The Intel Q67 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the POS System contains a single SO-DIMM, 16 MB of memory is pre-allocated for it at system startup. If the POS System contains two SO-DIMMs, 32 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.



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



| Front View                                  | Quantity Supported | Position | Controller |
|---|--------------------|----------|------------|
| 3.5-inch SATA Hard Drive                    | 3                  | 1, 2*, 3 | SATA       |
| Optical Drive Bay or Carrier for Hard Drive | 1                  | 2        | SATA       |

External HDD can be connected through optional external ESATA port. 3 Drive maximum

**NOTE:** When ESATA is installed, either the 2nd HDD (if applicable) or ODD (if applicable) cannot be used.

\* For CRU Removable storage in lieu of ODD

## Data Storage Drives

### 250-GB Hard Disk Drives

HP 250-GB SATA 3.0 Hard Disk Drive (3.5")

7,200 rpm, 8MB cache, 6.0 GB/s, NCQ, Smart IV

HP 250-GB SATA 3.0 Removable Hard Disk Drive

7,200 rpm, 8MB cache, 6.0 GB/s, NCQ, Smart IV

### 500-GB Hard Disk Drives

HP 500-GB SATA 3.0 Hard Disk Drive

7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

HP 500-GB SATA 3.0 Removable Hard Disk Drive

7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

### 1-TB Hard Disk Drives

HP 1 TB SATA 3.0 Hard Disk Drive

7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

### Solid State Drives

HP 80-GB 2.5" Solid State Drive

HP 160-GB 2.5" Solid State Drive





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

### Optical Disc Drives

HP DVD-ROM Drive<sup>1</sup>

HP SuperMulti DVD Writer Drive<sup>1,2,3</sup>

HP Blu-ray Writer Drive

<sup>1</sup> For playing DVDs, Corel WinDVD 8

<sup>2</sup> For writing CDs, choice of Sonic/Roxio Easy Media Creator 9 or Roxio Business Creator 10

<sup>3</sup> For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio Easy Media Creator 9 or Roxio Business Creator 10

### Media Card Readers

HP 22-n-1 Media Card Reader

## Security Solutions and Capabilities

Trusted Platform Module (TPM) 1.2<sup>1</sup>

Stringent security (via BIOS)<sup>2</sup>

SATA port disablement (via BIOS)

Drive lock

RAID configurations

HP ProtectTools Security Software Suite

Serial, parallel, USB enable/disable (via BIOS)

Optional USB Port Disable at factory (user configurable via BIOS)

Power Configurable Serial Ports (COM 1, 2, 3 and 4 ) via the HP BIOS

Removable media write/boot control

Power-On password (via BIOS)

Setup password (via BIOS)

HP Hood Sensor

TPM 1.2 Embedded Security Chip\* integrated with Broadcom NIC

HP ProtectTools Security Software Suite with BIOS Configuration (serial (all 4), parallel, USB enable / disable), Credential Manager, Smart Card Manager (sold separately)

Three (3) port 12 Volt USB + PWR Card (sold separately)

Two (2) port Power Configurable RS232 Serial Card COM 3 & 4 (sold separately)

Wall Mount (sold separately)

HP Desktop Security Lock Kit (lock and cable) (sold separately)

Security Cable with Kensington lock (sold separately)

HP Rear Port/Cable Control Cover (sold separately)

<sup>1</sup> TPM module disabled where use is restricted by law; for example, Russia.

<sup>2</sup> This setting is defaulted to disable, but when enabled, the PW jumper will not clear the BIOS pre-boot authentication passwords.

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



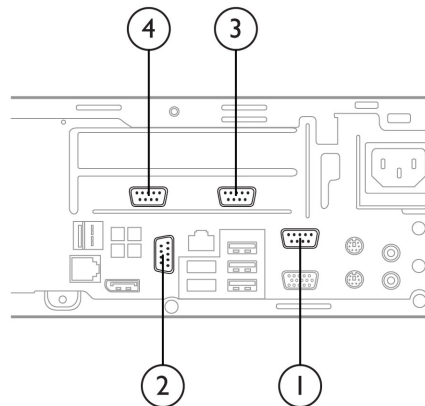
## Standard Features and Configurable Components (availability may vary by country)

### I/O Ports

|             |  |
|-------------|--|
| USB 2.0     | Front: Two (2), covered<br>Rear: Five (5)  |
| USB 24V     | One (1) 24V powered USB  |
| Serial      | Two (2) RS-232 (power configurable) ports standard   |
| Parallel    | One port available as an option*   |
| eSATA       | One port available as an option*   |
| RS-232      | Two (2) RS-232 powered configurable ports optional (for a total of 4*)   |
| USB+PWR 12V | Two (2) USB+PWR 12V cards optional (three (3) 12 Volt USB+ PWR per card) for a total of 6*   |
| PS/2        | One (1) color-coded support for keyboard (purple)<br>One (1) color-coded support for mouse (green)   |
| RJ-11       | One (1) RJ-11 Cash Drawer port   |
| Video       | One (1) VGA<br>One (1) DisplayPort v1.1a<br>Provides integrated dual independent monitor support   |
| DVI output  | Available via optional DisplayPort to DVI Adapter  |
| Audio       | Rear: Line input (supports microphone or line input) and line out<br>All ports are 3.5mm in diameter<br><b>NOTE:</b> See Audio/Visual section for information on re-taskable audio ports |
| NIC         | One (1) Industry standard RJ-45 port accesses the integrated network interface controller  |

\*These options occupy slot openings so less slots will be available when the options are installed

### Serial Ports (Power Configurable in HP Bios) – detail



**1 and 2:** Powered Configurable serial port expansion card installation that supplies two additional serial ports (COM3 and COM4)

**3 and 4:** Two Power Configurable serial ports, COM1 and COM 2, are standard on the POS System.

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

### Slots

|             |   |
|-------------|---|
| Full-Height | Total of Two (2) Full-Height Slots, with a <b>Choice of either:</b><br>1.) PCI – Two (2) each: 4.2" full height, 6.6" length, 25W max. power<br>2.) PCIe x1 – Two (2) each: 4.2" full height, 6.6" length, 10W max. power |
| Half-Height | Total of Two (2) Half-Height:<br>PCI Express x1 – One (1) each: 2.5" low profile, 6.6" length, 10W max. power<br>PCI Express x16 – One (1) each: 2.5" low profile, 6.6" length, 75W max. power                            |

### Bays

|              |                          |
|--------------|--------------------------|
| External     | 1 each 5.25", 5.7" depth |
| Internal HDD | 2 each 3.5"              |

### Controllers

|                 |  |
|-----------------|--|
| Hard drive      | SATA<br>Supports up to SATA 6.0 Gb/s   |
| SATA interfaces | One (1) SATA 2.0<br>Two (2) SATA 3.0   |
| Host SATA       | 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 |

### Network Interface Connections

Intel 82579LM (integrated) GbE Network Connection  
Intel PRO 1000 CT GbE NIC Card (PCIe x1) (optional)

**NOTE:** The integrated network connection is required to support Intel vPro Technology

### Communications

HP WLAN NIC 802.11 b/g/n PCIe Card  
2006 LSI PCIe x1 56K International SoftModem (optional)



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

## Graphics

Intel HD Graphics (integrated)  
AMD FirePro 2270  
Nvidia Quadro NVS 300 Graphics (PCIe x16) and PCIe x1)

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

---

## Multi-Media

High Definition Audio with Realtek ALC261 codec (all ports are stereo)  
Line-out and Line-In rear Ports (3.5mm)  
Internal Speaker (standard)

---

## Input/Output Devices

HP PS/2 Standard Keyboard  
HP USB Standard Keyboard  
HP USB Mini Keyboard  
HP USB and PS/2 Washable Keyboard  
HP PS/2 Optical Mouse  
HP USB Optical Mouse  
HP USB Laser Mouse  
HP USB and PS/2 Washable Mouse

---

## Miscellaneous Devices and Configurations

HP FireWire (IEEE 1394) PCIe x1 Card  
HP Parallel Port Adapter  
HP eSATA Port Adapter  
HP Tower Stand  
HP Rear Port/Cable Control Cover  
rp5800 50C Thermal Kit  
rp5800 PCI Riser Assembly  
rp5800 PCIe Riser Assembly  
Three (3) port 12 Volt USB + Pwr Card  
Two (2) port RS232 Serial (power configurable) COM 3 & 4 port card



After-Market Options (availability may vary by region)

### Communication Devices

|   | Part #  |
|---|---------|
| Intel Gigabit CT Desktop NIC (PCIe x1)                | FH969AA |
| Broadcom NetXtreme GbE Ethernet Plus NIC (PCIe x1)    | FS215AA |
| HP Wireless 802.11 b/g/n NIC (PCIe x1)                | FH971AA |
| Broadcom 5755 10/100/1000 NIC with TPM 1.2 support    |         |
| LSI Hi-Speed 56K Int'l SoftModem PCIe Card Modem RJ11 |         |

**NOTE:**

The use of a discrete network interface connection card (wired or wireless) will disable the vPro Technology features.

### Graphics Solutions

|   | Part #  |
|---|---------|
| AMD FirePro 2270                          | QK551AA |
| Nvidia Quadro NVS 300 Graphics (PCIe x16) | BV456AA |
| Nvidia Quadro NVS 300 Graphics(PCIe x1)   | BV457AA |

|   |         |
|---|---------|
| HP DMS-59 to Dual DVI Adapter             | DL193A  |
| HP DMS-59 to Dual DisplayPort Adapter     | XP688AA |
| HP DisplayPort Cable Kit                  | VN567AA |
| HP DisplayPort To Dual Link DVI-D Adapter | NR078AA |
| HP DisplayPort To DVI-D Adapter           | FH973AA |
| HP DisplayPort to HDMI Adapter            | BP937AA |
| HP DisplayPort to VGA Adapter             | AS615AA |

### Hard Disk Storage Drives

|  | Part #  |
|--|---------|
| HP 500GB SATA (6.0Gb/s) Hard Disk Drive                  | QK554AA |
| HP 1TB SATA (6.0Gb/s) Hard Disk Drive                    | QK555AA |
| HP 80-GB Solid State Drive                               | BM848AA |
| HP 160-GB Solid State Drive                              | WV915AA |
| HP eSATA Adapter   | FH966AA |
| HP Removable SATA Hard Drive Enclosure (frame & carrier) | RY102AA |
| HP Removable SATA Hard Drive Enclosure (carrier only)    | RY103AA |



After-Market Options (availability may vary by region)

### Input / Output Devices

|   | Part #  |
|---|---------|
| HP PS/2 Standard Keyboard                       | DT527A  |
| HP USB Standard Keyboard                        | DT528A  |
| HP USB Mini Keyboard                            | AS601AA |
| HP 2-port Powered Serial Port Card              | QP906AA |
| HP 3-port 12 Volt Powered USB Port Card         | QP905AA |
| HP USB Keyboard and Mouse Kit                   | RC465AA |
| HP USB Washable Keyboard                        | VF097AA |
| HP USB and PS/2 Washable Mouse                  | BM866AA |
| HP USB and PS/2 Washable Keyboard and Mouse Kit | BU207AA |
| HP PS/2 Optical Mouse                           | EY703AA |
| HP USB Optical Mouse                            | DC172AA |
| HP USB Laser Mouse                              | GW405AT |
| HP rp5800 PCI Riser Assembly                    | QP907AA |
| HP rp5800 PCIe x1 Riser Assembly                | QP908AA |

### System Memory

|              | Part #  |
|--------------|---------|
| HP 1 GB DIMM | AT023AA |
| HP 2 GB DIMM | AT024AA |
| HP 4 GB DIMM | VH638AA |

### Multimedia Devices

|                         | Part #  |
|-------------------------|---------|
| HP DVD-ROM Drive        | AR629AA |
| HP SuperMulti Drive     | AR630AA |
| HP Blu-ray Writer Drive | AR482AA |

### Removable Media Storage

|                             | Part #  |
|-----------------------------|---------|
| HP 22-n-1 Media Card Reader | AR941AA |



After-Market Options (availability may vary by region)

### Security Devices

|                                     | Part #  |
|-------------------------------------|---------|
| HP Chassis Security Kit             | AR639AA |
| HP/Kensington MicroSaver Cable Lock | PC766A  |
| HP Business PC Security Lock        | PV606AA |
| HP Wall Mount/Security Sleeve       | VN570AA |
| HP Keyed Lock Cable                 | VB411AA |

### Accessories

|   | Part #  |
|---|---------|
| HP rp5800 Trim Bezel – with ODD Opening | QP910AA |
| HP Integrated Work Center Stand         | GN783AA |
| HP Tower Stand                          | VN569AA |
| HP Parallel Port Adapter                | KD061AA |
| HP FireWire (IEEE 1394) Card            | PA997A  |
| HP SuperSpeed USB 3.0 Card              | BM867AA |
| HP Rear Port / Cable Control Cover      | QP909AA |

### RPOS specific accessories

|   | Part #  |
|---|---------|
| HP Heavy Duty Cash Drawer                               | FK182AA |
| HP Flip-Top Cash Drawer                                 | BW867AA |
| HP Flip-Top Till with Locking Cover                     | BZ335AA |
| HP Laser Barcode Scanner                                | EY022AA |
| HP Imaging Barcode Scanner                              | BW868AA |
| HP POS Pole Display                                     | FK225AA |
| HP USB Mini MSR with Brackets                           | FK186AA |
| HP POS Keyboard   | FK221AA |
| HP POS Keyboard with MSR                                | FK218AA |
| HP USB Thermal Receipt Printer                          | FK224AA |
| HP Serial USB Receipt Printer                           | BM476AA |
| HP Hybrid POS Printer with MICR                         | FK184AA |
| HP USB Y Cable (for Serial USB Receipt Printer)         | BM477AA |
| HP L5006tm 15-inch LCD Touchscreen Monitor              | RB146AA |
| HP L5009tm 15-inch LCD Touchscreen Monitor              | VK202AA |
| HP L1506x 15-inch LED Display (Non-Touchscreen Monitor) | LL543AA |
| HP rp5800 Terminal Enclosure Assembly                   | QQ971AA |
| HP rp5800 Integration Tray Assembly                     | QQ972AA |



*After-Market Options (availability may vary by region)*

HP Display Pole Mount Assembly

QQ973AA

HP Optional Display Arm Assembly

QQ974AA





## Technical Specifications

### Weights & Dimensions

(configured with 1 HDD & 1 ODD)

|                       |                       |
|-----------------------|-----------------------|
| Chassis               | 3.95 x 13.3 x 14.9 in |
| (H x W x D)           | 100 x 338 x 379 mm    |
| System Volume         | 782.77 cu in          |
|                       | 13.0 L                |
| Tower Stand           | 1.1 x 7.0 x 7.9 in    |
| (H x W x D)           | 29 x 178 x 200 mm     |
| Packaging             | 9.0 x 19.7 x 23.4 in  |
| (H x W x D)           | 229 x 500 x 594 mm    |
| System Weight*        | 15.08 lb              |
|                       | 6.84 kg               |
| Shipping Weight*      | 16.28 lb              |
|                       | 7.34 kg               |
| Max Supported Weight  | 77.0 lb               |
| (desktop orientation) | 35.0 kg               |

### Unit Environment and Operating Conditions

#### General Unit Operating Guidelines

- Keep the POS System 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 front side and power supply side of the POS System to permit the required airflow.
- If within an enclosure, the front side should be 100% open. The clearance between the system and the cabinet must be at least 10 mm (0.4 inch) on the sides and top and at least 50-mm (2-inch) clearance in the rear with power supply venting area 100% open per the above bullet.
- Never restrict airflow into the POS System by blocking any vents or air intakes.
- Do not stack POS Systems on top of each other or place POS Systems 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 POS System. Lint, dust and other foreign matter can block the vents and limit the airflow.

|  |   |
|--|---|
| <b>Temperature Range</b>                   | Operating: 50° to 104 F (10° to 40° C)*<br>Non-operating: -22° to 140° F (-30° to 60° C)                  |
| <b>Relative Humidity</b>                   | Operating: 20% to 85% (non-condensing at ambient)<br>Non-operating: 5% to 90% (non-condensing at ambient) |
| <b>Maximum Altitude</b><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.

**NOTE:** An optional thermal configuration is available to support 50C ambient temperatures. This is a factory configurable configuration only.



### Technical Specifications

|                                |  |
|--------------------------------|--|
| Power Supply                   | 240-watt – EPA90 power supply – Active PFC   |
|                                | <i>*This power supply meets ENERGY STAR compliance in conjunction with a select range of processors and modules.</i> |
| Operating Voltage Range        | 90 to 264 VAC  |
| Rated Voltage Range            | 100 to 240VAC  |
| Rated Line Frequency           | 50/60 Hz   |
| Operating Line Frequency Range | 47 – 63 Hz   |
| Rated Input Current            | 4A<br>Efficiency 87/90/87% at 20/50/100% load  |
| Power Supply Fan               | 80 mm variable speed fan   |
| ENERGY STAR Compliant          | ENERGY STAR 5.0 compliant  |
| Power Cord Length              | 6.0ft (1.8 3m)   |
| Current Leakage (NFPA99)       | < 275 $\mu$ A  |

### ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP rp5800 Retail System into retail, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Select models feature either Intel Standard Manageability or vPro Technology.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- 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 rp5800 Retail System in any retail 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 the HP rp5800 Retail Systems, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP rp5800 Retail System BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website

#### 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 rp5800 Retail Systems use ACPI to provide power conservation features.
- S5 Max Power Savings setting supports EU Lot6 requirement and allows the HP rp5800 Retail System to power down below 1W in S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.



### Technical Specifications

#### Other 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.
- System Management BIOS v2.6
- Intel Wired for Management support; industry wide initiative to make Intel architecture based Retail Systems, 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 the HP rp5800 Retail System to indicate either normal or fault condition
- Indicator Lights on front of system:

|                        |                  |
|------------------------|------------------|
| Power / Diagnostic LED | Hard Drive LED   |
| NIC Link LED           | NIC Activity LED |

- Diagnostic LED Explanation Table:
  - Number of 1-second red LED blinks followed by a 2-second pause, then repeats:
    - 2 – processor thermal protection activated
    - 3 – processor not installed
    - 4 – power supply failure
    - 5 – memory error
    - 6 – video error
    - 7 – PCA failure (ROM detected failure prior to video)
    - 8 – invalid ROM, bootblock recovery mode
    - 9 – system not fetching code
    - 10 – system hang while loading an option ROM
- System/Emergency ROM
- NIC Link and activity LED's on front bezel
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software
- 5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber) - Rear
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power button
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, Optical Drive (?) Removal

**NOTE:** thumb screw release mechanism is used with the Ultra-slim Desktop chassis cover.



## Technical Specifications

### Additional Features

|  | Description  |
|--|--|
| Intel® Standard Manageability  | <ul style="list-style-type: none"> <li>• Requires the utilization of the integrated network connection</li> <li>• Delivered with processors that are not part of the Intel Stable Intel Platform Program (SIPP)</li> <li>• Intel Advanced Management Technology (AMT) v3.2</li> <li>• Basic Retail SYSTEM management capabilities such as asset inventory, HW alerting, SOL/IDE-R, remote configuration, agent presence and system defense.</li> <li>• DASH 1.1 compliance. Support for profile updates.</li> <li>• Host VPN support for local management VPN tunneling</li> </ul> <p>Intel Standard Manageability includes features of Intel Active Management Technology (Intel AMT). Intel AMT requires the Retail system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. For more information, see <a href="http://www.intel.com/technology/platform-technology/intel-amt/">http://www.intel.com/technology/platform-technology/intel-amt/</a>.</p> |
| DASH 1.1 support (Desktop and Mobile Architecture for System Hardware) | A standards initiative for representing out-of-band management capability for Retail Systems. It is a secure, web-services based successor to ASF.   |
| ASF 2.0 support (Alert Standard Format)                                | Industry-standard specification for network alerting in operating system-absent environments   |
| TXT (Trusted Execution Technology) and VT-d (Virtualized devices)      | <p>TXT allows for secure management (via TPM) and measured launch of VMM, as well as teardown of secrets in unexpected reset case. TXT support provided in select Intel processors</p> <p>VT-d is a chipset technology that virtualizes directed I/O</p> <p>Together, TXT and VT-d may be used to support verified launch of a known trusted VMM that also may protect VMs from accessing each other's memory.</p>   |
| Computrace   | Computrace agent support standard  |
| Towerable Orientation  | The chassis can be oriented as either a desktop or a tower.  |
|  | 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  |
| Drive Protection System  | <p>Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the Retail System's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced</p> <p>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</p>   |
| 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   |



## *Technical Specifications*

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.



## Technical Specifications - Audio

### High Definition Audio

|  |   |
|--|---|
| Type                                       | Integrated  |
| HD Stereo Codec                            | Realtek 2-channel ALC261 codec  |
| Audio I/O Ports                            | Rear Line-In/Microphone input (150-K ohm Input Impedance, function is configurable by audio driver)<br>Rear Line-Out* (190 ohms Output Impedance, expects at least a 10-K ohm load)<br>Line-in and Line-out, both on rear.<br>All ports are 3.5mm in diameter |
| 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<br>(software)          | Yes – Uses OS soft wavetable  |
| Analog Audio                               | Yes   |
| # of Channels on Line-Out<br>(mono/stereo) | Stereo (Left & Right channels)  |
| Internal Speaker                           | Yes   |
| External Speaker Jack<br>(Line-Out)        | Yes   |



### Technical Specifications - Communications

#### Intel 82579LM GbE Network Connection (integrated)

|                       |  |
|-----------------------|--|
| Connector             | RJ-45  |
| System Interface      | Integrated on PCA  |
| Controller            | Intel 82579LM gigabit platform LAN connect networking controller   |
| Memory                | 24 KB FIFO packet buffer memory  |
| Data rates supported  | 10/100/1000 Mbps   |
| Compliance            | IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3 ab and 802.3u compliant   |
| Bus architecture      | GLCI, LCI interface. Intel specific MAC to PHY interface   |
| Data transfer mode    | At gigabit GLCI (Intel proprietary 802.3 series-based interface) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.                   |
| Data rates supported  | 10/100/1000 Mbps   |
| Compliance            | IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3ab and 802.3u compliant  |
| Bus architecture      | GLCI, LCI interface. Intel specific MAC to PHY interface   |
| Data transfer mode    | At gigabit GLCI (Intel proprietary 802.3 series-based interface) is for Data, LCI (parallel bus) for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.                   |
| Power requirement     | Requires 3.3V, 1.9/1.8V and 1.0V or just 3.3V with integrated regulators<br>Power consumption 1.3 Watts for 82567 whole LOM  |
| ACBS                  | Intel Auto Connect Battery Saving feature  |
| 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: 32° to 131°F (0° to 55° C)<br>To 70° C for external regulator<br>Operating Humidity: 85% at 131° F (55° C)  |
| Management            | WOL, auto MDI crossover, PXE, Multi-port teaming, RSS, Advanced cable diagnostic.  |
| Alerting              | ASF 2.0 support, AMT 3.0 support   |



## Technical Specifications - Communications

### Intel Gigabit CT Desktop Network Interface Controller (AMO)

|                         |  |  |
|-------------------------|--|--|
| Connector               | RJ-45  |  |
| System Interface        | PCI Express x1   |  |
| Controller              | Intel WG82574L Gigabit Ethernet Controller   |  |
| Memory                  | Integrated Dual 48K configurable transmit receive FIFO Buffers                         |  |
| Data rates supported    | 10/100/1000 Mbps   |  |
| Compliance              | IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control   |  |
| Bus architecture        | PCI Express 1.0a   |  |
| Data path width         | X1, 250 MB/s, Bi-directional interface   |  |
| Data transfer mode      | Bus-master DMA   |  |
| Hardware certifications | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |  |
| Power requirement       | Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T                           |  |
| Boot ROM support        | Yes  |  |
| Network Transfer Rate   | 10BASE-T (half-duplex)   | 10 Mbps                                    |
|                         | 10BASE-T (full-duplex)   | 20 Mbps                                    |
|                         | 100BASE-TX (half-duplex)   | 100 Mbps                                   |
|                         | 100BASE-TX (full-duplex)   | 200 Mbps                                   |
|                         | 1000BASE-T (full-duplex)   | 2000 Mbps (actual rate limited by PCI Bus) |
| Environmental           | Operating Temperature:   | 32° to 131°F (0° to 55° C)                 |
|                         | Operating Humidity:  | 85% at 131° F (55° C)                      |
| Dimensions              | 4.75 x 2.25 x 0.8 in (12.1 x 5.7 x 2.0 cm)   |  |
| Management              | WOL, PXE, DMI, WFM 2.0   |  |

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

|                       |  |
|-----------------------|--|
| Dimensions (L x H)    | 3.3 x 4.7 in   |
|                       | 8.5 x 12 cm  |
| Weight                | 0.08 lbs   |
|                       | 40 g   |
| Controller            | Ralink RT2790  |
| System interface      | PCI Express x1   |
| Network standard      | 802.11 b/g/n   |
| Frequency band        | 2.400 - 2.497 GHz  |
| Operating temperature | 14° to 149°F, operating (-10° to 65°C, operating)          |
| Storage temperature   | -40° to 176°F, non-operating (-40° to 80°C, non-operating) |
| Humidity              | 10-90% operating   |
|                       | 5-95% non-operating  |
| Operating voltage     | 3.3V +/- 9%  |
|                       | 12V +/- 8%   |

| Power Consumption | Platform/WLAN Mode         | Power Consumption |
|-------------------|----------------------------|-------------------|
|                   | Maximum Power Consumption: | 10 Watts          |





### Technical Specifications - Communications

|                               |   |   |
|-------------------------------|---|---|
| Output Power<br>(approximate) | Transmit Only   | 4 Watts maximum averaged power over 1 second                    |
|                               | Transmit Packet or Active Scanning  | 1000 mA peak current for 100 microseconds or longer             |
|                               | Receive Only Mode or Idle without IEEE PSP mode enabled                   | 3 Watts maximum averaged over 1 second                          |
|                               | Idle, with IEEE PSP mode enabled  | 1.0 Watts maximum averaged over 1 second                        |
|                               | Transmit Disabled<br>(turned off in software)                             | 50 mW maximum, averaged over 1 second                           |
|                               | Platform in S3 or S4<br>(power removed from Low Profile PCI Express Card) | 5 mW maximum, averaged over 1 second                            |
|                               | 802.11b mode  | +19 dBm +/- 1.0 dB maximum                                      |
|                               | 802.11g mode  | +17 dBm +/- 1.0 dB maximum                                      |
|                               | EWC mode  | +17 dBm +/- 1.0 dB maximum (total power in all transmit chains) |

| Receive Sensitivity | Mode          | Data Rate | Sensitivity |
|---------------------|---------------|-----------|-------------|
|                     | 802.11b       | 1 Mbps    | -94 dBm     |
|                     | 802.11b       | 11 Mbps   | -85 dBm     |
|                     | 802.11g       | 6 Mbps    | -91 dBm     |
|                     | 802.11g       | 18 Mbps   | -85 dBm     |
|                     | 802.11g       | 48 Mbps   | -75 dBm     |
|                     | 802.11g       | 54 Mbps   | -72 dBm     |
|                     | EWC (2.4 GHz) | 6.5 Mbps  | -87 dBm     |
|                     | EWC (2.4 GHz) | 54 Mbps   | -82 dBm     |
|                     | EWC (2.4 GHz) | 81 Mbps   | -78 dBm     |
|                     | EWC (2.4 GHz) | 162 Mbps  | -74 dBm     |
|                     | EWC (2.4 GHz) | 270 Mbps  | -68 dBm     |
|                     | EWC (2.4 GHz) | 300 Mbps  | -64 dBm     |

| Data Transfer Rate | Data Rate (MCS)       | Minimum Throughput |
|--------------------|-----------------------|--------------------|
|                    | 1 Mbps (802.11 b)     | 700 kbps           |
|                    | 2 Mbps (802.11 b)     | 1.4 Mbps           |
|                    | 5.5 Mbps (802.11 b)   | 3.5 Mbps           |
|                    | 11 Mbps (802.11 b)    | 5.9 Mbps           |
|                    | 12 Mbps (802.11 g)    | 6 Mbps             |
|                    | 18 Mbps (802.11 g)    | 9 Mbps             |
|                    | 24 Mbps (802.11 g)    | 12 Mbps            |
|                    | 36 Mbps (802.11 g)    | 18 Mbps            |
|                    | 48 Mbps (802.11 g)    | 21 Mbps            |
|                    | 54 Mbps (802.11 g)    | 22.5 Mbps          |
|                    | 6.5 Mbps (20 MHz EWC) | 4.5 Mbps           |



Technical Specifications - Communications

|  |                         |           |
|--|-------------------------|-----------|
|  | 13 Mbps (20 MHz EWC)    | 9 Mbps    |
|  | 19.5 Mbps (20 MHz EWC)  | 13.5 Mbps |
|  | 26 Mbps (20 MHz EWC)    | 18 Mbps   |
|  | 39 Mbps (20 MHz EWC)    | 27 Mbps   |
|  | 52 Mbps (20 MHz EWC)    | 36 Mbps   |
|  | 58.5 Mbps (20 MHz EWC)  | 40 Mbps   |
|  | 65 Mbps (20 MHz EWC)    | 45 Mbps   |
|  | 78 Mbps (20 MHz EWC)    | 54 Mbps   |
|  | 104 Mbps (20 MHz EWC)   | 72 Mbps   |
|  | 117 Mbps (20 MHz EWC)   | 81 Mbps   |
|  | 130 Mbps (20 MHz EWC)   | 91 Mbps   |
|  | 13.5 Mbps (40 MHz EWC)  | 8 Mbps    |
|  | 27 Mbps (40 MHz EWC)    | 16 Mbps   |
|  | 40.5 Mbps (40 MHz EWC)  | 24 Mbps   |
|  | 54 Mbps (40 MHz EWC)    | 32 Mbps   |
|  | 81 Mbps (40 MHz EWC)    | 48 Mbps   |
|  | 108 Mbps (40 MHz EWC)   | 64 Mbps   |
|  | 121.5 Mbps (40 MHz EWC) | 72 Mbps   |
|  | 135 Mbps (40 MHz EWC)   | 81 Mbps   |

|                                   |   |
|-----------------------------------|---|
| Security                          | IEEE and WiFi compliant 64 / 128 bit WEP encryption |
|                                   | AES: CCM  |
|                                   | 802.1x authentication                               |
|                                   | WPA: 802.1x. WPA-PSK and TKIP                       |
|                                   | WPA2 certification                                  |
|                                   | IEEE 802.11i  |
|                                   | Cisco Certified Extensions, all versions through V5 |
| Antenna                           | HP part number 497792-001                           |
| Certifications                    | Wi-Fi certified                                     |
| Certifications for use by country | United States, Canada, Peru, Taiwan                 |

## Technical Specifications - Graphics

### Intel HD Graphics (integrated)

|                               |  |
|-------------------------------|--|
| 3D/2D Controller              | Microsoft DirectX 10.1 based with support for Pixel Shader 4.1   |
| VGA Controller                | Integrated   |
| DisplayPort                   | v1.1a; integrated, multimode capable; supports HDCP and audio over DisplayPort   |
| Bus Type                      | PCI Express x16  |
| RAMDAC                        | Integrated, 350 MHz  |
| Memory                        | Graphics memory is shared with system memory. Graphics memory usage varies 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.  |
| HW Video Decode               | Hardware Accelerated decode for MPEG2 encrypted video; support for PAVP  |
| Maximum Color Depth           | 32 bits/pixel  |
| Maximum Vertical Refresh Rate | 85 Hz at up to 1920x1440, 75 Hz at 2048x1536. Varies with mode and configuration. See table below.   |
| Multi-display Support         | Integrated dual independent monitor support facilitated via one VGA port and one DisplayPort v1.1a integrated on the back plane of the system board and presented as part of the rear I/O set of interfaces. Support for DVI, HDMI, dual link DVI or second VGA monitor provided by optional HP DisplayPort adapters.  |
|                               | The system can support greater than two monitors with the addition of an optional discrete graphics card. Both integrated graphics and discrete graphics can be utilized simultaneously.   |
| Graphics/Video API Support    | Microsoft DirectX 10.1, OpenGL 3.0   |
| Resolutions Supported         |  |

| Resolution | Maximum Refresh Rate |                    |
|------------|----------------------|--------------------|
|            | Analog Connection    | Digital Connection |
| 640x480    | 85                   | 60                 |
| 800x600    | 85                   | 60                 |
| 1024x768   | 85                   | 60                 |
| 1280x720   | 85                   | 60                 |
| 1280x1024  | 85                   | 60                 |
| 1440x900   | 75                   | 60                 |
| 1600x1200  | 85                   | 60                 |
| 1680x1050  | 75                   | 60                 |
| 1920x1080  | 85                   | 60-R               |
| 1920x1200  | 85                   | 60-R               |
| 1920x1440  | 85                   | N/A                |
| 2048x1536  | 75                   | N/A                |
| 2560x1600  | N/A                  | 60*                |

\* Only supported when using a DisplayPort connection



## Technical Specifications - Graphics

**NOTE:**

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

**NOTE:**

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

### NVIDIA NVS 300 PCIe Graphics Card

|                         |  |
|-------------------------|--|
| Form Factor             | Dimensions Low-profile, 2.586 x 5.7 in (6.57 x 14.48 cm)   |
| Graphics Controller     | Nvidia GT218 GPU   |
| Bus Type                | PCIe x16 or PCIe x1  |
| Memory                  | 512 MB DDR3  |
| Connectors              | DMS-59 Connector   |
| Board Display Options   | Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual single-link DVI-I connectors cable kit part number: DL139A |
| Multi-monitor support   | Dual analog or digital (Single Link DVI) monitors (DVI support requires optional DVI cable kit DL139A)   |
| Supported Graphics APIs | OpenGL 3.3 support in hardware for optimal performance with OpenGL applications<br>DirectX 10.1 support in hardware for optimal performance in DX10 applications     |

| Resolution | Analog Connection | Digital Connection |
|------------|-------------------|--------------------|
| 640x480    | 85                | 60                 |
| 800x600    | 85                | 60                 |
| 1024x768   | 85                | 60                 |
| 1280x720   | 85                | 60                 |
| 1280x1024  | 85                | 60                 |
| 1440x900   | 75                | 60                 |
| 1600x1200  | 85                | 60                 |
| 1680x1050  | 75                | 60                 |
| 1920x1080  | 85                | 60-R               |
| 1920x1200  | 85                | 60-R               |
| 2048x1536  | 85                | N/A                |
| 1920x1440  | 75                | N/A                |

**NOTE:**

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



## Technical Specifications - Graphics

### AMD FirePro 2270 512MB Graphics Card

|                         |   |
|-------------------------|---|
| Form Factor             | Low Profile, Half Length, 2.3" x 6.6"   |
| Graphics Controller     | AMD FirePro™ 2270 Professional Graphics   |
| Bus Type                | PCI Express™ x16 Generation 2.0   |
| Memory                  | 512MB DDR3  |
| Connectors              | DMS-59 connector to support breakout cables for dual DisplayPort, DVI and VGA output.<br>DMS-59 to VGA adapter included.<br>(Dual Display Port and Dual DVI adapters sold separately) |
| Maximum Resolution      | Digital 2560x1600 (DisplayPort)<br>Analog 1920x1200 (DVI 60 Hz/ VGA 75Hz)   |
| RAMDAC                  | 400 MHz DAC, 10-bit per channel   |
| Display Output          | Power two 30" high resolution displays  |
| Supported Graphics APIs | DirectX 11 and OpenGL 4.0   |

### HP DisplayPort to DVI-D Adapter

|                |   |
|----------------|---|
| Connectors     | DisplayPort and DVI-D single link connector |
| Adapter length | 7.5 in (19.0 cm)                            |
| Adapter weight | .10 lbs (.05 kg)                            |

### HP DisplayPort to VGA Adapter

|                            |                               |
|----------------------------|-------------------------------|
| Connectors                 | DisplayPort and VGA connector |
| Adapter length             | 8 in (20 cm)                  |
| Adapter weight             | .1 lbs (.06 kg)               |
| Max. vertical refresh rate | 85 Hz                         |
| Display support            | 162 MHz RAMDAC                |
| Display max resolution     | 1600x1200                     |
| Resolutions Supported      |                               |

| Resolution | Max refresh rate |
|------------|------------------|
| 640x480    | 85               |
| 800x600    | 85               |
| 1024x768   | 85               |
| 1280x720   | 85               |
| 1280x1024  | 85               |
| 1440x900   | 75               |
| 1600x1200  | 60               |
| 1680x1050  | 60               |
| 1920x1080  | 60-R             |
| 1920x1200  | 60-R             |



## Technical Specifications - Graphics

**NOTE:**

Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP. Using the HP DisplayPort to VGA Adapter may require an update to the graphics driver installed on your system. To install the most up-to-date graphics driver go to:

[www.hp.com](http://www.hp.com).

**NOTE:**

60-R denotes reduced blanking timings are used. Not all monitors support reduced blanking timing.



### Technical Specifications – Data Storage Drives

#### Introduction:

HP Serial Advanced Technology Attachment (SATA) Hard Drives maximize the performance of HP Retail Systems 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 Retail System platform enabling easy aggregation of multiple hard drives into a single Retail System. This offers you the additional benefits of dedicated bandwidth, the ability to more easily identify device failures and scalability. The HP rp5800 Retail System 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 – Data Storage Drives

#### HP 80-GB Solid State Drive

|   |  |                               |
|---|--|-------------------------------|
| Unformatted Capacity                              | 80-GB  |                               |
| Architecture                                      | Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller |                               |
| Interface   | Serial ATA (SATA)  |                               |
| 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<br>(all conditions, non-condensing) | Operating Temperature:   | 32° to 158° F (0° to 70° C)   |
|   | Relative Humidity:   | 5% to 95%                     |
|   | Maximum Wet Bulb<br>Temperature (operating):                               | 84° F (29° C)                 |
|   | Shock:   | 1,500 G/0.5-ms                |

#### NOTE:

For solid state disk drives, GB means 1 billion bytes. 16GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity varies by content and will be less than 15.8GB.

#### HP 160-GB Solid State Drive

|                        |  |                               |
|------------------------|--|-------------------------------|
| Unformatted Capacity   | 160-GB   |                               |
| Architecture           | Multi Level Cell (MLC) NAND Flash with wear leveling 10 channel controller |                               |
| Interface              | Serial ATA (SATA)  |                               |
| 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                                   |                               |





## Technical Specifications – Data Storage Drives

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

### NOTE:

For solid state disk drives, GB means 1 billion bytes. 16GB is the unformatted capacity of this drive before a portion of the drive is reserved for flash management features. Actual capacity varies by content and will be less than 15.8GB.

## HP 250-GB Hard Disk Drive (3.5")

|   |                                |        |
|---|--------------------------------|--------|
| Capacity  | 250,059,350,016 bytes          |        |
| Rotational Speed  | 7,200 rpm                      |        |
| Interface   | Serial ATA (SATA) 3.0          |        |
| Synchronous Transfer Rate<br>(maximum)  | Up to 6 GB/s                   |        |
| Buffer Size   | 8 MB                           |        |
| Logical Blocks  | 488,397,168                    |        |
| Seek Time (typical reads,<br>includes controller overhead,<br>including settling) | Single Track:                  | 1.0 ms |
|   | Average:                       | 8.5 ms |
|   | Full-Stroke:                   | 18 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 500-GB Hard Disk Drive

|   |                                |        |
|---|--------------------------------|--------|
| Capacity  | 500,107,862,016 bytes          |        |
| Rotational Speed  | 7,200 rpm                      |        |
| Interface   | Serial ATA (SATA) 3.0          |        |
| Synchronous Transfer Rate<br>(maximum)  | Up to 6 GB/s                   |        |
| Buffer Size   | 16 MB                          |        |
| Logical Blocks  | 976,773,168                    |        |
| Seek Time (typical reads,<br>includes controller overhead,<br>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    |        |



Technical Specifications – Data Storage Drives

Operating Temperature      41° to 131° F  
   5° to 55° C

HP 1-TB Hard Disk Drive

|   |                                |        |  |
|---|--------------------------------|--------|--|
| Capacity  | 1,000,xxxxx bytes              |        |  |
| Rotational Speed  | 7,200 rpm                      |        |  |
| Interface   | Serial ATA (SATA) 3.0          |        |  |
| Synchronous Transfer Rate<br>(maximum)  | Up to 6 GB/s                   |        |  |
| Buffer Size   | 16 MB                          |        |  |
| Logical Blocks  | 976,773,168                    |        |  |
| Seek Time (typical reads,<br>includes controller overhead,<br>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<br>5° to 55° C   |        |  |



### Technical Specifications - Input/Output Devices

#### HP USB Standard Keyboard

|                          |                           |   |
|--------------------------|---------------------------|---|
| Physical characteristics | Keys                      | 104, 105, 106, 107, 109 layout (depending upon country) |
|                          | Dimensions<br>(L x W x H) | 18.0 x 6.4 x 0.98 in<br>45.8 x 16.3 x 2.5 cm            |
|                          | Weight                    | 2 lb<br>0.9 kg  |
| Electrical               | Operating voltage         | + 5VDC $\pm$ 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               | Languages                 | 38 available  |
|                          | Keycaps                   | Low-profile design                                      |
|                          | Switch actuation          | 55-g nominal peak force with tactile feedback           |
|                          | Switch life               | 20 million keystrokes (using Hasco modified tester)     |
|                          | Switch type               | Contamination-resistant switch membrane                 |
|                          | Key-leveling mechanisms   | For all double-wide and greater-length keys             |
|                          | Cable length              | 6 ft (1.8 m)  |
|                          | Microsoft PC 99 - 2001    | Mechanically compliant                                  |
|                          | Acoustics                 | 43-dBA maximum sound pressure level                     |
|                          | Operating temperature     | 50° to 122° F (10° to 50° C)                            |
| 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              |



### Technical Specifications - Input/Output Devices

|                      |   |  |
|----------------------|---|--|
|                      | Drop (in box)   | 42 in (107 cm) on concrete, 16-drop sequence |
| Approvals            | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC |  |
| Ergonomic compliance | ANSI HFS 100, ISO 9241-4, and TUVGS                         |  |
| Kit contents         | Keyboard  | Installation Guide                           |
|                      | Warranty Card   | Safety and Comfort Guide                     |

### HP PS/2 Standard Keyboard

|                          |                           |   |
|--------------------------|---------------------------|---|
| Physical characteristics | Keys                      | 104, 105, 106, 107, 109 layout (depending upon country) |
|                          | Dimensions<br>(L x W x H) | 18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)             |
|                          | Weight                    | 2 lb (0.9 kg) minimum                                   |
| Electrical               | Operating voltage         | + 5VDC $\pm$ 5%   |
|                          | Power consumption         | 50-mA maximum (with three LEDs ON)                      |
|                          | 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    |
| Mechanical               | Microsoft® PC 99 - 2001   | Functionally compliant                                  |
|                          | Languages                 | 38 available  |
|                          | Keycaps                   | Low-profile design                                      |
|                          | Switch actuation          | 55-g nominal peak force with tactile feedback           |
|                          | Switch life               | 20 million keystrokes (using Hasco modified tester)     |
|                          | Switch type               | Contamination-resistant switch membrane                 |
|                          | Key-leveling mechanisms   | For all double-wide and greater-length keys             |
|                          | Cable length              | 6 ft<br>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)                  |



### Technical Specifications - Input/Output Devices

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

#### Approvals

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

#### Ergonomic compliance

ANSI HFS 100, ISO 9241-4, and TUVGS

## HP USB Smart Card (CCID) Keyboard

### Introduction:

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

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

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

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

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

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

#### 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



## Technical Specifications - Input/Output Devices

|                          |                           |  |
|--------------------------|---------------------------|--|
| Physical Characteristics | Keys                      | 104, 105, 106, 107, 109 layout<br>(depending upon country) |
|                          | Form factor               | USB basic smart card keyboard                              |
|                          | Colors                    | Carbonite/Silver   |
|                          | Dimensions<br>(H x W x D) | 18.2 x 6.3 x 1.3 in<br>46.3 x 16.1 x 3.3 cm                |
|                          | Weight                    | 2 lb (0.9 kg) minimum                                      |
| Electrical               | Operating voltage         | + 5VDC $\pm$ 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                                     |
| Mechanical               | Languages                 | 30+ available  |
|                          | Keycaps                   | Standard design  |
|                          | Switch actuation          | 55 g nominal peak force with tactile feedback              |
|                          | Switch life               | 20 million keystrokes<br>(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)                               |
| 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                                      |



### Technical Specifications - Input/Output Devices

|                          |  |  |                                |
|--------------------------|--|--|--------------------------------|
| SmartCard Function       | Drop<br>(out of box)                                       | 26 in (66 cm) on carpet, six-drop sequence   |                                |
|                          | Drop<br>(in box)   | 42 in (107 cm) on concrete, 16-drop sequence   |                                |
|                          | 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 |  |                                |
| Smart Card Compatibility | HP   | HP ProtectTools Smart Card   |                                |
|                          | American Express   | Amex Blue  |                                |
|                          | Axalto (Schlumberger)                                      | Cryptoflex 8K  |                                |
|                          |  | Cryptoflex 16K   |                                |
|                          |  | Cryptoflex 32K   |                                |
|                          |  | Cryptoflex 32K e-gate  |                                |
| Cyberflex Access 64K     |  |  |                                |
|                          | Cyberflex Access 32K                                       |  |                                |
|                          | Cyberflex 32K e-gate                                       |  |                                |



## Technical Specifications - Input/Output Devices

|                    |   |
|--------------------|---|
|                    | Cyberflex 64K   |
|                    | Cyberflex Palmera   |
|                    | Payflex-S   |
|                    | Payflex 1K  |
|                    | Payflex 2K  |
|                    | Payflex 4K  |
|                    | Payflex 8K  |
|                    | Prismera  |
|                    | US DoD CAC  |
|                    | PrimeFlex Store 8K  |
|                    | PrimeFlex Store 2K  |
| Cardlogix          | CLXSU004KK4<br>CLXSU008KK5  |
| Safenet, Inc.      | Model 300<br>Model 330  |
| De-La Rue          | VisaCash  |
| Gemplus            | Gem Espresso<br>GKK32K<br>Gemclub Memo<br>GemClub Micro<br>GemXplore<br>GemSafe                                     |
| Infineon           | SLE66C322P<br>SLE4406<br>SLE4406E<br>SLE4406E SE<br>SLE4418<br>SLE4428<br>SLE4432<br>SLE4436E<br>SLE4442<br>SLE5536 |
| SafLink (Litronic) | Forte   |
| Shart              | Java Card   |
| Oberthur           | CosmopolIIC v4<br>CosmopolIIC v4.1<br>Cosmo ID-One<br>GalatIIC v2.1<br>US DoD CAC                                   |
| Memory Cards       |   |
| Atmel              | AT24C01ASC<br>AT24C02SC<br>AT24C04SC<br>AT24C08SC   |





## Technical Specifications - Input/Output Devices

|              |            |
|--------------|------------|
|              | AT24C16SC  |
|              | AT24C32SC  |
|              | AT24C64SC  |
|              | AT24C128SC |
|              | AT24C256SC |
|              | AT24C512SC |
|              | AT88SC153  |
|              | AT88SC1608 |
| ISSI         | IS23SC4418 |
|              | IS23SC4428 |
| ST           | 14C02      |
| Telefonkarte | SLE4406    |
|              | SLE4436    |
|              | SLE5536    |
| XICOR        | X24026     |

## HP USB & PS2 Washable Keyboard

|                          |                           |   |
|--------------------------|---------------------------|---|
| Physical characteristics | Keys                      | 104, 105, 106, 107, 109 layout (depending upon country) |
|                          | Dimensions<br>(L x W x H) | 18.0 x 6.4 x 0.98 in<br>45.8 x 16.3 x 2.5 cm            |
|                          | Weight                    | 2 lb (0.9 kg) minimum                                   |
| Electrical               | Operating voltage         | + 5VDC $\pm$ 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    |
| Mechanical               | Microsoft® PC 99 - 2001   | Functionally compliant                                  |
|                          | 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<br>2.2 m   |
|                          | Microsoft PC 99 - 2001    | Mechanically compliant                                  |



## Technical Specifications - Input/Output Devices

|                      |  |  |
|----------------------|--|--|
| Environmental        | Acoustics  | 43-dBA maximum sound pressure level          |
|                      | Operating temperature  | 50° to 122° F<br>10° to 50° C                |
|                      | Non-operating temperature  | -4° to 149° F<br>-20° to 65° 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   |
| Approvals            | Drop (in box)  | 42 in (107 cm) on concrete, 16-drop sequence |
|                      | 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  |  |

## HP PS/2 Optical Mouse

|                           |                           |   |
|---------------------------|---------------------------|---|
| Dimensions<br>(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<br>0° to 40° C              |
|                           | Non-operating temperature | -4° to 140°F<br>-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                     |



### Technical Specifications - Input/Output Devices

|                      |   |   |
|----------------------|---|---|
| Electrical           | Drop<br>(out of box)  | 80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face |
|                      | Operating voltage   | 5 VDC $\pm$ 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  |
| Mechanical           | Microsoft PC99 - 2001                                       | Functionally compliant  |
|                      | Resolution  | 400 $\pm$ 20% DPI   |
|                      | Tracking speed  | 10 in/s (25.4 cm/s) maximum   |
|                      | Acceleration  | 100 in/s/s (2.54 m/s/s)   |
|                      | Switch actuation  | 61 g nominal peak force   |
|                      | Switch life   | 3,000,000 operations (using Hasco modified tester)  |
|                      | Switch type   | Low force micro-switches  |
|                      | Tracking mechanism life                                     | 155 mi (250 km) at average speed of 10 in/s   |
|                      | Cable length  | 6 ft (1.8 m)  |
|                      | Microsoft PC99 - 2001                                       | Mechanically compliant  |
| Scroll wheel         | Width   | 8 mm  |
|                      | Diameter  | 1.01 in (25.6 mm)   |
|                      | Maximum rotation speed                                      | 48 rats/sec   |
|                      | Switch type   | Light force micro-switch  |
|                      | Switch life   | 1 million operations  |
|                      | Mechanical life   | Minimum 200,000 revolutions   |
| Regulatory Approvals | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC |   |



## Technical Specifications - Input/Output Devices

### HP USB Optical Mouse

|                           |  |
|---------------------------|--|
| Dimensions<br>(H x L x W) | 1.5 x 4.5 x 2.5 in<br>3.8 x 11.6 x 6.3 cm                              |
| Weight                    | 0.27 lb<br>0.12 kg   |
| Cable length              | 72.8 in<br>185 cm  |
| System requirements       | Microsoft Windows 95, 98, 2000, Me, XP and Vista<br>Available USB port |

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### HP USB Laser Mouse

|                           |   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
|---------------------------|---|-----------------------|------------------------------|---------------------------|--------------------------------|--------------------|---|------------------------|---|-----------------|--------------------|---------------------|--------------------|---------------------|-----------------------|-------------------------|-----------------------|
| Scroll Wheel              | 24  |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Maximum Rotation Speed    | 48 rats/sec   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Switch Type               | Wheel   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Switch Life               | Button - 3,000,000<br>Wheel - 1,000,000 times<br>Tilt switch - 500,000 times  |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Environmental             | <table><tr><td>Operating Temperature</td><td>32° to 104° F<br/>0° to 40° C</td></tr><tr><td>Non-operating Temperature</td><td>-4° to 140° F<br/>-20° to 60° C</td></tr><tr><td>Operating Humidity</td><td>10% to 90%<br/>(non-condensing at ambient)</td></tr><tr><td>Non-operating Humidity</td><td>20% to 80%<br/>(non-condensing at ambient)</td></tr><tr><td>Operating Shock</td><td>40 g, six surfaces</td></tr><tr><td>Non-operating Shock</td><td>80 g, six surfaces</td></tr><tr><td>Operating Vibration</td><td>2-g peak acceleration</td></tr><tr><td>Non-operating Vibration</td><td>4-g peak acceleration</td></tr></table> | Operating Temperature | 32° to 104° F<br>0° to 40° C | Non-operating Temperature | -4° to 140° F<br>-20° to 60° C | Operating Humidity | 10% to 90%<br>(non-condensing at ambient) | Non-operating Humidity | 20% to 80%<br>(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 |
| Operating Temperature     | 32° to 104° F<br>0° to 40° C  |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Non-operating Temperature | -4° to 140° F<br>-20° to 60° C  |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Operating Humidity        | 10% to 90%<br>(non-condensing at ambient)   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Non-operating Humidity    | 20% to 80%<br>(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   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Electrical                | <table><tr><td>Operating Voltage</td><td>+ 5VDC <math>\pm</math> 5%</td></tr><tr><td>Power Consumption</td><td></td></tr><tr><td>MTBF</td><td>&gt; 150,000 hrs</td></tr></table>  | Operating Voltage     | + 5VDC $\pm$ 5%              | Power Consumption         |                                | MTBF               | > 150,000 hrs                             |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Operating Voltage         | + 5VDC $\pm$ 5%   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| Power Consumption         |   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |
| MTBF                      | > 150,000 hrs   |                       |                              |                           |                                |                    |   |                        |   |                 |                    |                     |                    |                     |                       |                         |                       |



Technical Specifications - Input/Output Devices

|                      |  |  |
|----------------------|--|--|
| Mechanical           | ESD  | IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV |
|                      | EMI-RFI  | FCC Class B  |
|                      | PC98   | PC 99 Compliant  |
|                      | Resolution   | 800dpi   |
|                      | Tracking Speed   | 25 cm/sec  |
|                      | Acceleration   | 0.5mm  |
|                      | Switch Actuation   | 0.6N (60gf)  |
|                      | Switch Life  | Button - 3,000,000   |
|                      |  | Wheel - 1,000,000 times  |
|                      |  | Tilt switch - 500,000 times  |
| Cable Length         | 1850mm   |  |
| PC98-99              | PC99 compliant   |  |
| Regulatory Approvals | UL60950-1, UL 94, UL 746 (A-E), UL 796                         |  |
|                      | TUV/GS: EN 60950-1, EN 60825-1                                 |  |
|                      | FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL |  |



## Technical Specifications - Ports and Port Configuration

### HP Blu-ray Writer Drive

|                           |  |
|---------------------------|--|
| Height                    | 5.25-inch, half-height, tray-load          |
| Orientation               | Either horizontal or vertical              |
| Interface type            | SATA/ATAPI                                 |
| Disc capacity             | 50 GB DL or 25 GB standard                 |
| Dimensions<br>(W x H x D) | 5.9 x 1.7 x 7.5 in<br>15.0 x 4.4 x 19.0 cm |
| Weight<br>(max)           | 2.0 lb<br>907g                             |

| Write Speeds | Single-layer                                    | Double-layer  |
|--------------|---|---------------|
| BD-R         | 2x, 4x CLV, 6x CAV                              | 2x, 4x CLV    |
| BD-RE        | 2.3x  | 2x CLV        |
| DVD-R        | 2x, 4x CLV, 8x ZCLV, 8x, 12x<br>PCAV, 16x CAV   | 2x, 4x CLV    |
| DVD-RW       | 1x, 2x, 4x, 6x CLV                              | Not supported |
| DVD+R        | 2.4x, 4x CLV, 8x ZCLV, 8x,<br>12x PCAV, 16x CAV | 2.4x, 4x CLV  |
| DVD+RW       | 2.4x, 4x, 6x CLV, 8x ZCLV                       | Not supported |
| DVD-RAM      | 2x, 3x CLV, 3-5x PCAV                           |               |
| CD-R         | 8x, 16x CLV, 24x, 32x PCAV, 40x CAV             |               |
| CD-RW        | 4x, 10x, 16x CLV, 24x ZCLV                      |               |

| Read Speeds                | Single-layer | Double-layer |
|----------------------------|--------------|--------------|
| BD-ROM                     | 6x CAV       | 4.8x CAV     |
| BD-R                       | 6x CAV       | 4.8x CAV     |
| BD-RE (SL/DL)              | 4.8x CAV     | 4.8x CAV     |
| DVD-ROM                    | 16x CAV      | 8x CAV       |
| DVD-R                      | 12x CAV      | 8x CAV       |
| DVD-RW                     | 10x CAV      | Not support  |
| DVD+R                      | 12x CAV      | 8x CAV       |
| DVD+RW                     | 10x CAV      | Not support  |
| BDMV (AACs Compliant Disc) | 4.8x CAV     |              |



## Technical Specifications - Ports and Port Configuration

|   |   |  |
|---|---|--|
|   | DVD-RAM                                     | 2x, 3x CLV, 3x-5x PCAV   |
|   | DVD-Video (CSS Compliant Disc)              | 8x CAV   |
|   | CD-R/RW/ROM                                 | 40x / 40x / 40x CAV  |
|   | CD-DA (DAE)                                 | 32x CAV  |
|   | 80 mm CD                                    | 16x CAV  |
| Sustained Transfer rate                             | BD-ROM                                      | 26.97 MB/s (6x) max.   |
|   | DVD-ROM                                     | 16.62 MB/s (16x) max.  |
|   | CD-ROM                                      | 6,000 KB/s (40x) max.  |
| Buffer Transfer Rates                               | 1.5Gbps bits/s (10b side)                   |  |
|   | 1.2Gbps bits/s (8b side)                    |  |
| Multimedia MPC-3 compliant                          | Yes   |  |
| Access times<br>(typical reads, including setting)  | Random                                      | DVD: < 140 ms (typical), CD: < 125 ms (typical)                                    |
|   | Full Stroke                                 | DVD: < 250 ms (seek), CD: < 210 ms (seek)  |
| Power   | Source                                      | SATA DC power receptacle   |
|   | DC Power Requirement                        | 5 VDC $\pm$ 5%-100 mV ripple p-p<br>12 VDC $\pm$ 5%-200 mV ripple p-p              |
|   | DC Current                                  | 5 VDC -1000 mA typical, 1600 mA maximum<br>12 VDC -600 mA typical, 1400 mA maximum |
| Environmental<br>(all conditions<br>non-condensing) | Temperature (operating)                     | 41° to 122° F (5° to 50° C)  |
|   | Relative Humidity (operating)               | 10% to 90%   |
|   | Maximum Wet Bulb<br>Temperature (operating) | 86° F (30° C)  |

## HP SuperMulti DVD Writer Drive

|                        |   |
|------------------------|---|
| Height                 | 5.25-inch, half-height, tray-load         |
| Orientation            | Either horizontal or vertical             |
| Interface type         | SATA/ATAPI                                |
| Disc capacity          | 8.5 GB DL or 4.7 GB standard              |
| Dimensions (W x H x D) | 5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm) |
| Weight (max)           | 2.6 lb (1.2 kg)                           |
| Write speeds           | DVD-RAM Up to 12X                         |



## Technical Specifications - Ports and Port Configuration

|  |                                    |  |
|--|------------------------------------|--|
| Read speeds  | DVD+R                              | Up to 16X  |
|  | DVD+RW                             | Up to 8X   |
|  | DVD+R DL                           | Up to 8X   |
|  | DVD-R DL                           | Up to 8X   |
|  | DVD-R                              | Up to 16X  |
|  | DVD-RW                             | Up to 6X   |
|  | CD-R                               | Up to 48X  |
|  | CD-RW                              | Up to 32X  |
|  | DVD-RAM                            | Up to 12X  |
|  | DVD+RW, DVD-RW, DVD+R DL, DVD-R DL | Up to 8X   |
|  | DVD-ROM DL                         | Up to 8X   |
|  | DVD-ROM, DVD+R, DVD-R              | Up to 16X  |
|  | CD-ROM, CD-R                       | Up to 48X  |
|  | CD-RW                              | Up to 32X  |
| Access time<br>(typical reads, including settling)       | Random                             | DVD: < 140 ms (typical), CD: < 125 ms (typical)  |
|  | Full Stroke                        | DVD: < 250 ms (seek), CD: < 210 ms (seek)  |
| Power  | Source                             | SATA DC power receptacle   |
|  | DC Power Requirement               | 5 VDC $\pm$ 5%-100 mV ripple p-p<br>12 VDC $\pm$ 5%-200 mV ripple p-p                    |
|  | DC Current                         | 5 VDC (< 1000 mA typical, 1600 mA maximum)<br>12 VDC (< 600 mA typical, 1400 mA maximum) |
| Environmental conditions<br>(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 DVD-ROM Drive

|                |                                   |
|----------------|-----------------------------------|
| Height         | 5.25-inch, half-height, tray-load |
| Orientation    | Either horizontal or vertical     |
| Interface type | SATA/ATAPI                        |





## Technical Specifications - Ports and Port Configuration

|   |   |   |              |
|---|---|---|--------------|
| <b>Disc capacity</b>                                      | Single layer: Up to 4.7 GB (6 times capacity of CD-ROM)<br>Double layer: Up to 8.5 GB (12 times capacity of CD-ROM) |   |              |
| <b>Dimensions (W x H x D)</b>                             | 5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)   |   |              |
| <b>Weight (max)</b>                                       | 2.6 lb (1.2 kg)   |   |              |
| <b>Read speeds</b>  | DVD+R/-R/+RW/-RW/+R DL /-R DL   | Up to 8X  |              |
|   | DVD-ROM   | Up to 16X   |              |
|   | DVD-RAM   | Up to 4X  |              |
|   | CD-ROM, CD-R  | Up to 40X   |              |
|   | CD-RW   | Up to 32X   |              |
| <b>Removable Storage - Media Compatibility - DVD-ROM</b>  | <b>Media</b>  | <b>Read</b>   | <b>Write</b> |
|   | CD-ROM  | Yes   | No           |
|   | CD-R  | Yes   | No           |
|   | CD-RW   | Yes   | No           |
|   | DVD-ROM   | Yes   | No           |
|   | DVD-ROM DL  | Yes   | No           |
|   | DVD-RAM   | Yes   | No           |
|   | DVD+R   | Yes   | No           |
|   | DVD+R DL  | Yes   | No           |
|   | DVD+RW  | Yes   | No           |
|   | DVD-R   | Yes   | No           |
|   | DVD-RW  | Yes   | No           |
|   | DVD-R DL  | Yes   | No           |
| <b>Access times</b><br>(typical reads, including setting) | <b>Random</b>   | DVD: < 140 ms (typical), CD: < 125 ms (typical)   |              |
|   | <b>Full Stroke</b>  | DVD: < 250 ms (seek), CD: < 210 ms (seek)   |              |
|   | <b>Cache Buffer</b>   | 2 MB (minimum)  |              |
|   | <b>Data Transfer Modes</b>  | 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) |              |
| <b>Power</b>  | <b>Source</b>   | SATA DC power receptacle  |              |
|   | <b>DC Power Requirement</b>   | 5 VDC $\pm$ 5%-100 mV ripple p-p<br>12 VDC $\pm$ 5%-200 mV ripple p-p                                       |              |
|   | <b>DC Current</b>   | 5 VDC - <1000 mA typical, < 1600 mA maximum<br>12 VDC - < 600 mA typical, < 1400 mA maximum                 |              |



## Technical Specifications - Ports and Port Configuration

|   |                                 |                             |
|---|---------------------------------|-----------------------------|
| Environmental<br>(all conditions<br>non-condensing) | Temperature                     | 41° to 122° F (5° to 50° C) |
|   | Relative Humidity               | 10% to 90%                  |
|   | Maximum Wet Bulb<br>Temperature | 86° F (30° C)               |

## HP 22-n-1 Media Card Reader

USB Interface USB 2.0 High-speed interface

### NOTE:

Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.

|                          |   |
|--------------------------|---|
| Advance protocol support | Supports hardware ECC (Error Correction Code) function                |
|                          | Supports hardware CRC (Cyclic Redundancy Check) function              |
| Supported media type     | Supports MS 4-bit parallel transfer mode                              |
|                          | Supports MS-PRO 4-bit parallel transfer mode                          |
|                          | Supports MS PRO-HG Duo 4-bit parallel transfer mode                   |
|                          | Supports SD 4-bit parallel transfer mode                              |
|                          | Supports high-speed 50Mhz SD 4-bit card (version 2.0)                 |
|                          | Supports high-speed 52Mhz MMC 8-bit card (version 4.2)                |
|                          | Supports CF v4.0 with PIO mode 6 and Ultra DMA mode                   |
|                          | CompactFlash Type I   |
|                          | CompactFlash Type II  |
|                          | Microdrive  |
|                          | MultiMediaCard (MMC)  |
|                          | Reduced Size MultiMediaCard (RS MMC)                                  |
|                          | MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC)                  |
|                          | Reduced Size MultiMediaCard 4.2 (MMC Mobile, including MMC Mobile HC) |
|                          | Secure Digital Card (SD)  |
|                          | Secure Digital High Capacity (SDHC)                                   |
|                          | miniSD  |
|                          | miniSD High Capacity  |
|                          | Micro SD (T-Flash)  |
|                          | Micro SD HC   |



## Technical Specifications - Ports and Port Configuration

Memory Stick  
Memory Stick Select  
Memory Stick Duo (MS Duo)  
Memory Stick PRO (MS PRO)  
Memory Stick PRO Duo (MS PRO Duo)  
Memory Stick PRO-HG Duo  
MagicGate Memory Stick (MG)  
MagicGate Memory Stick Duo  
xD-Picture Card  
Memory Stick Micro (M2)  
MMC Micro

Supported media type with  
card adapter



### Technical Specifications - Environmental Data

#### Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

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

| Energy Consumption                 | 115 VAC | 230 VAC | 100 VAC |
|------------------------------------|---------|---------|---------|
| Normal Operation                   | 38.55 W | 38.62 W | 38.42 W |
| Sleep (Energy Star low power mode) | 2.65 W  | 2.90 W  | 2.70 W  |
| Off                                | 0.93 W  | 1.12 W  | 0.92 W  |

#### NOTE:

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

| Heat Dissipation* | 115 VAC    | 230 VAC    | 100 VAC    |
|-------------------|------------|------------|------------|
| Normal Operation  | 132 BTU/hr | 132 BTU/hr | 131 BTU/hr |
| Sleep             | 9 BTU/hr   | 10 BTU/hr  | 9 BTU/hr   |
| Off               | 3 BTU/hr   | 4 BTU/hr   | 3 BTU/hr   |

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

#### Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

| System Fan Off                | Sound Power<br>(LWAd, bels) | Sound Pressure<br>(LpAm, decibels) |
|-------------------------------|-----------------------------|------------------------------------|
| Idle                          | 3.7                         | 28                                 |
| Fixed Disk<br>(random writes) | 3.8                         | 29                                 |

#### Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

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



### Technical Specifications - Environmental Data

Battery size: CR2032 (coin cell)

Battery type: Lithium

#### Additional formation

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level where HP registers commercial desktop products. See <http://www.epeat.net> for registration status in your country.
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 4.62% post consumer recycled plastic (by wt.)
- This product is 93.7% recyclable when properly disposed of at end of life.

#### Packaging Materials

- External:
  - Corrugated – 1966 g
- Internal:
  - Polyethylene low density foam – 154 g
- The corrugated packaging material contains at least 38.38% recycled content.
- The Polyethylene low density Foam packaging material contains at least 60.42% recycled content.

#### RoHS Compliance

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

#### Material Usage

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

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

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Ozone Depleting Substances



### Technical Specifications - Environmental Data

- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
- Nickel finishes that release greater than 0.5 micro-grams/cm<sup>2</sup>/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

#### Packaging

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

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

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

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

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

#### Hewlett-Packard Corporate Environmental Information

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

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

Eco-label certifications

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>



## *Technical Specifications - Environmental Data*

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