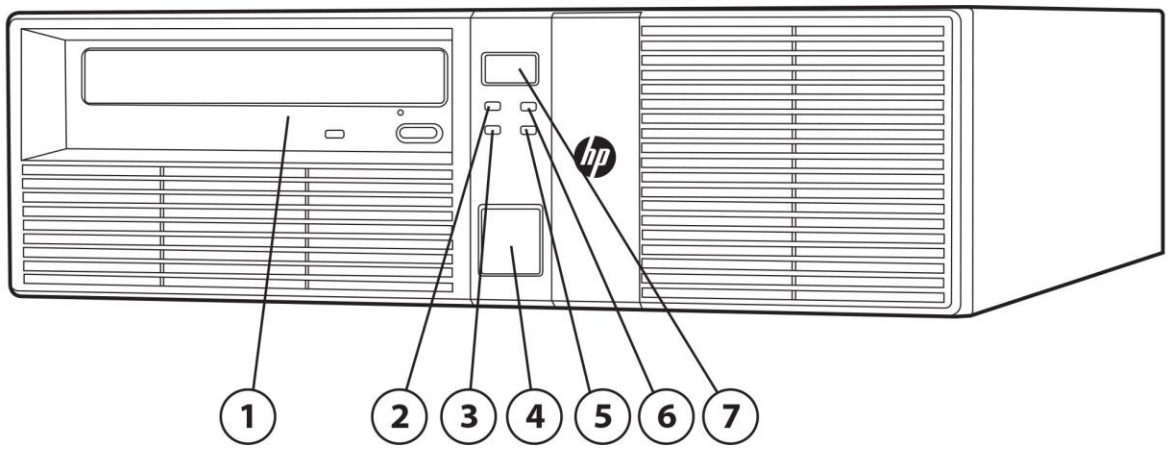
Overview

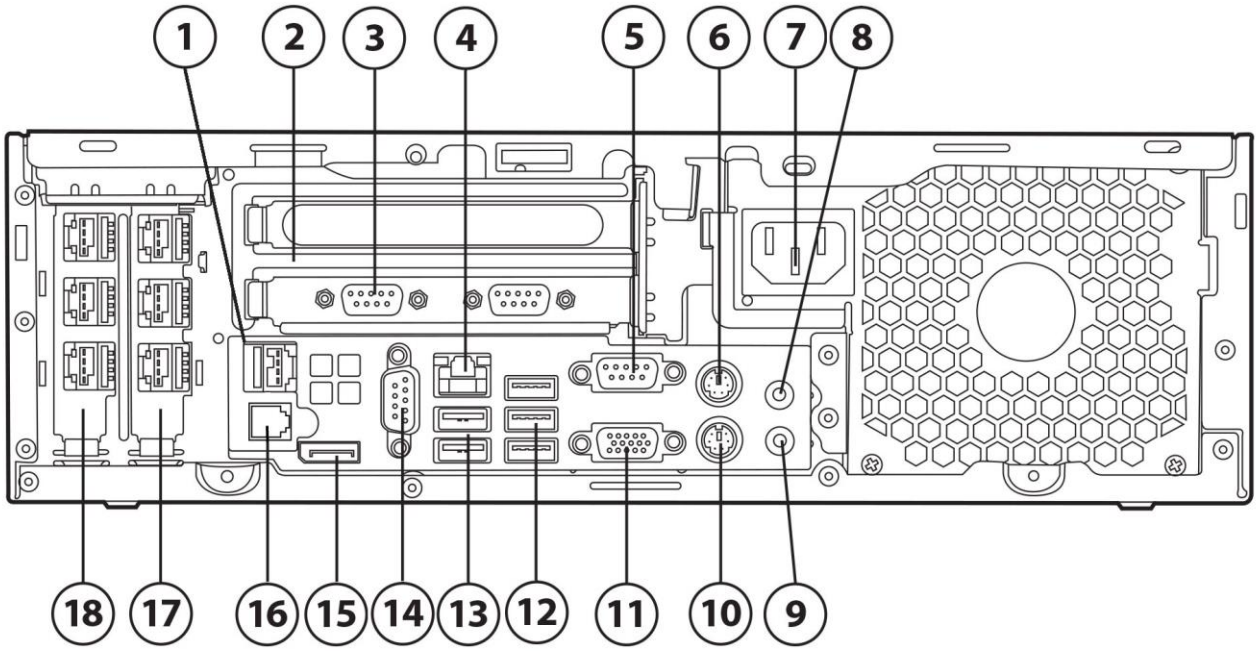
HP RP5 Retail System, Model 5810



Front View

1. 5.25” external optical drive
2. Power/ Diagnostic LED
3. NIC link indicator LED
4. 2 USB 2.0 ports with sliding door
5. NIC link indicator LED
6. Hard Drive LED
7. Power button

Overview



Rear View

1. 24 Volt USB + PWR port
2. Two (2) Full-Height Slots*
3. RS232 serial COM3
4. RJ-45 LAN jack
5. RS232 serial (power configurable) COM1 port
6. PS/2 mouse port
7. 240W EPA – Active PFC power supply (no line switching required)
8. Line in audio jack
9. Line out audio jack
10. PS/2 keyboard port
11. VGA port
12. 3 USB 2.0 ports
13. 2 USB 3.0 ports
14. RS232 serial (power configurable) COM2 port
15. DisplayPort
16. RJ12 cash drawer port
17. One (1) PCIe x16 Slot (wired as x16)** – shown is optional three (3) port 12 Volt USB +Power Card
18. One (1) PCIe x16 Slot (wired as x4)** – shown is optional three (3) port 12 Volt USB + Power Card

* Can be configured either as two (2) PCI x1 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).

**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.

Overview

Introduction

Get the flexibility and expandability to control everything from the store floor to the back office with the HP RP5 Retail System, Model 5810, an all-around high-performer that stands up to the rigors of a retail environment so you can focus on making sales.

At A Glance

- UEFI BIOS developed and engineered by HP for better security, manageability and software image stability
- Intel Q87 Express chipset supporting Intel 4th generation Intel ® Core™ processors, featuring Intel HD Graphics and vPro Technology (available with select processors)
- One of the following pre-installed operating systems:
  - Genuine Microsoft Windows 8.1 Pro 64-bit[1]
  - Genuine Microsoft Windows Embedded 8.1 Industry Pro Retail 64-bit
  - Genuine Microsoft Windows 7 Pro 32-bit or 64-bit[2,3] (available through downgrade rights from Windows 8.1 Pro)
  - Genuine Microsoft Windows Embedded POSReady7 32-bit or 64-bit
  - FreeDOS
- Intel I217LM GbE integrated network connection
- DDR3L Synchronous Dynamic Random Access Memory (SDRAM)
- Integrated dual independent monitor support via VGA and digital DisplayPort v1.2 interfaces
- Discrete graphics options available
- 90% high efficiency energy saving power supply
- ENERGY STAR 6.0 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
- 40°C ambient thermals standard.
- Optional HP Rear Port/Cable Control Cover Available
- Tool-less serviceability for easy upgrades and repair
- I/O ports including cash drawer port.
- Configurable Full-Height expansion slots; must choose either a PCI x1 Riser or PCIe x1 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

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

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

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

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

Operating Systems

Preinstalled

Genuine Microsoft Windows 8.1 Pro 64-bit[1]

Genuine Microsoft Windows Embedded 8.1 Industry Pro Retail 64-bit

Genuine Microsoft Windows 7 Pro 32-bit or 64-bit[2,3] (available through downgrade rights from Windows 8.1 Pro)

Genuine Microsoft Windows Embedded POSReady7 32-bit or 64-bit

FreeDOS

Tested

Microsoft Windows Server 2003 R2 Standard (32-bit & 64-bit)

Microsoft Windows Server 2008 R2 Standard (64-bit)

Microsoft Windows Server 2012 R2 Standard (64-bit)

Certified

Novell SUSE Linux Enterprise Desktop†

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

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

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

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

- 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

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

HP ProtectTools Security Suite

HP Software Management Agent

HP Computrace

HP Vision Diagnostics

PDF Complete Corporate Edition

Microsoft Office 2013 Starter

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

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

HP SoftPaq Download Manager

HP Client Catalog for Microsoft SMS

HP Systems Software Manager

HP Client Automation Starter

Retail Solutions Services and Features

Intel® Stable Image Platform Program (SIPP)

Factory Express Deployment and Lifecycle Services

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

Intel® vPro™ Technology*
HP Global Series Services
Intel® Standard Manageability
Trusted Platform Module (TPM) v1.2**

*Intel® vPro™ Technology available on models with Intel® Core™ i7 and Intel® Core™ i5 processors.
**TPM module disabled where restricted by law, i.e. Russia.

Service and Support

On-site warranty and service[1]: 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[2] and includes free telephone support[3] 24 x 7. Global coverage[2] 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.

1 Terms and conditions may vary by country. Certain restrictions and exclusions apply
2 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
3 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® Q87 Express

Processor

Intel® Celeron® Processors

Intel® Celeron® G1820 Processor
2.7GHz
2MB cache, 2 cores, 2 threads
Intel® GT1 – HD Graphics
Supports DDR3 memory up to 1333 MT/s data rate

Intel® Pentium® Processors

Intel® Pentium® G3420 Processor
3.2GHz
3MB cache, 2 cores, 2 threads
Intel® GT1 – HD Graphics
Supports DDR3 memory up to 1600 MT/s data rate

Intel® 4th Generation Core™ i3 Processors

Intel® Core™ i3-4150 Processor
3.5GHz
3MB cache, 2 cores, 4 threads
Intel® HD Graphics 4400
Supports DDR3 memory up to 1600 MT/s data rate

Intel® Core™ i3-4430 Processor
3.0GHz
6MB cache, 4 cores, 4 threads
Intel® GT2 – 4600 Graphics
Supports DDR3 memory up to 1600 MT/s data rate

Intel® 4th Generation Core™ i5 Processors

Intel® Core™ i5-4570S Processor
Up to 3.6GHz Max. Turbo Frequency (2.9GHz Base Frequency)
6MB cache, 4 cores, 4 threads
Intel® GT2 – 4600 Graphics
Supports DDR3 memory up to 1600 MT/s data rate
Supports Intel® vPro™ Technology and Intel® Stable Image Platform Program (SIPP)

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

Intel® 4th Generation Core™ i7 Processors

Intel® Core™ i7-4770S Processor
Up to 3.9GHz Max. Turbo Frequency (3.1GHz Base Frequency)
8MB cache, 4 cores, 8 threads
Intel® GT2 – 4600 Graphics
Supports DDR3 memory up to 1600 MT/s data rate
Supports Intel® vPro™ Technology and Intel® Stable Image Platform Program (SIPP)

NOTE: Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing system required. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

Intel® vPro™ Technology

HP RP5 Retail System, Model 5810 platforms featuring this technology include processors that are part of the Intel 2013 Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the HP RP5 Model 5810, thus making this model the most stable, secure, and manageable platforms available to retailers today.

Intel Advanced Management Technology (AMT) v9.0 – 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 9.0 includes the following advanced management functions:

- 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

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

appear in Drive Configuration when switching to 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 HP 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.

DDR3 Synchronous DRAM NON-ECC System Memory

The HP RP5 Retail System, Model 5810 supports the 4th generation Intel® Core™ processor family. Based on a new microarchitecture, the processor is designed for a two-chip platform consisting of a processor and Platform Controller Hub (PCH). Unlike previous generations, the 4th generation Intel® Core™ processor includes an Integrated Memory Controller (IMC). The IMC supports DDR3/DDR3L protocols with two independent, 64-bit wide channels each accessing one or two DIMMs.

- Two channels of non-ECC DDR3/DDR3L unbuffered dual in-line memory modules (UDIMM) or DDR3/DDR3L unbuffered small
- Outline dual in-line memory modules (U-DIMM) with a maximum of two DIMMs per channel
- Single-channel and dual-channel memory organization modes
- Data burst length of eight for all memory organization modes
- Memory data transfer rates of up to 1600 MT/s; actual supported data transfer rate determined by the configured processor.
- 64-bit wide channels
- DDR3/DDR3L system memory I/O voltage of 1.5V
- Theoretical maximum memory bandwidth of:
  - 21.3 GB/s in dual-channel mode assuming 1333 MT/s
  - 25.6 GB/s in dual-channel mode assuming 1600 MT/s

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

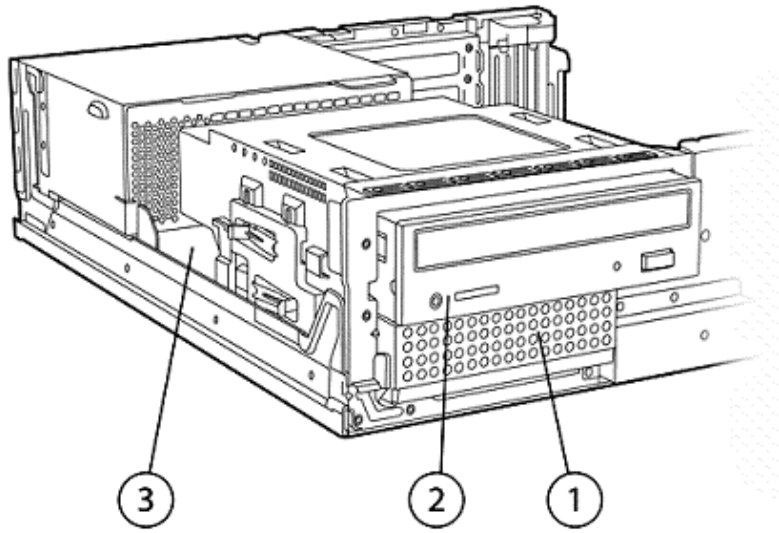
NOTE:
For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

Total Memory	Slot			
	Channel A		Channel B	
	1 (black)	2 (white)	3 (white)	4 (white)
4 GB	4 GB			

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

(dual channel symmetric)				
8 GB (dual channel symmetric)	4 GB	4 GB	4 GB	4 GB
16 GB (dual channel symmetric)	4 GB	4 GB	4 GB	4 GB
32GB (dual channel symmetric)	8 GB	8 GB	8 GB	8 GB

NOTE: The Intel Q87 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 U-DIMM, 16 MB of memory is pre-allocated for it at system startup. If the POS System contains two U-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.



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

SATA Hard Disk Drives

HP 500GB SATA 3.0 Hard Disk Drive (3.5")
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

HP 2TB SATA 3.0 Hard Disk Drive (3.5")
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

HP 500GB SATA 3.0 Removable Hard Disk Drive (3.5")
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

Note: For hard drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

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

SATA SED Hard Disk Drives

HP 500GB SATA SED 3.0 Hard Disk Drive (3.5")
7,200 rpm, 16MB cache, 6.0 GB/s, NCQ, Smart IV

Solid State Drives (2.5" Drives use a 3.5" drive cage adapter)

HP 32GB 2.5" SSD
HP 64GB 2.5" SSD
HP 128 GB M.2 PCIe SSD
HP 128GB 2.5" SSD
HP 256GB 2.5" SSD
HP 128GB 2.5" SED SSD
HP 256GB 2.5" SED SSD

Optical Disc Drive

HP SATA DVD-ROM Drive

Note: Optical drives are optional or add on features. Duplication of copyrighted material is strictly prohibited. Actual speeds may vary. Double Layer media compatibility will widely vary with some home DVD players and DVD-ROM drives. Note that DVD-RAM cannot read or write to 2.6GB Single Sided/5.2 Double Sided-Version 1.0 Media.

Security Solutions and Capabilities

Trusted Platform Module (TPM) 1.2[1]
Stringent security (via BIOS)[2]
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)

[1] TPM module disabled where use is restricted by law; for example, Russia.
[2] 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.

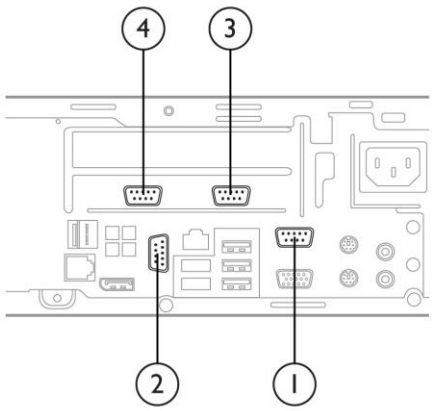
I/O Ports

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

USB	USB 2.0: Front: Two (2), covered Rear: Three (3) USB 3.0: Rear: Two (2)
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) One (1) color-coded support for mouse (green)
RJ-12	One (1) RJ-12 Cash Drawer port
Video	One (1) VGA One (1) DisplayPort v1.2 and One (1) DisplayPort v1.2 as an option* 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 All ports are 3.5mm in diameter **NOTE:** 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.

Slots

Full-Height	Total of Two (2) Full-Height Slots, with a ***Choice of either***: 1.) PCI x1 - Two (2) each: 4.2" full height, 6.6" length, 25W max. power 2.) PCIe x1 - Two (2) each: 4.2" full height, 6.6" length, 10W max. power
Half-Height	Total of Two (2) Half-Height:

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

PCIe x16 (wired as x4) - One (1) each: 2.5" low profile, 6.6" length, 10W max. power
PCIe x16 (wired as x16) - One (1) each: 2.5 low profile, 6.6" length, 25W max. power

Bays

External	1 each 5.25”
Internal HDD	2 each 3.5”

Controllers

Hard drive	SATA Supports up to SATA 6.0 Gb/s
SATA interfaces	One (1) SATA 2.0 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 I217LM GbE Network Connection (integrated)

Intel 7260 802.11 a/b/g/n Wireless PCIe CLink NIC (optional)

Intel I210-T1 PCIe x1 Gb NIC (optional)

Broadcom NetXtreme GgE PCIe NIC (optional)

NOTE: The integrated network connection is required to support Intel vPro Technology. 802.11 requires wireless access point and internet service. Availability of public wireless access points limited. Gigabit Ethernet speeds may vary.

Graphics

Integrated:
Intel HD Graphics (integrated)
Intel HD Graphics 4600

Discrete:

NVIDIA Quadro NVS 315 Graphics 1GB

NVIDIA Quadro NVS 510 Graphics 2GB

Note: HD content required to view HD images. Integrated Intel HD graphics uses part of the total system memory for video performance. System memory dedicated to video performance is not available for other use by other programs.

HP DisplayPort to DVI-D Adapter

HP DisplayPort to HDMI Adapter

HP DisplayPort to VGA Adapter

Multi-Media

High Definition Audio (integrated) 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 for Retail (optional)

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

HP PS/2 Optical Mouse (optional)
HP USB Standard Keyboard for Retail (optional)
HP USB Optical Mouse (optional)

Miscellaneous Devices and Configurations

HP Parallel Port Adapter
HP Serial Port Adapter
HP Tower Stand
HP Rear Port/Cable Control Cover
HP RP5 Model 5810 PCI Riser Assembly
HP RP5 Model 5810 PCIe Riser Assembly
Three (3) port 12 Volt USB + Pwr Card
Two (2) port RS232 Serial (power configurable) COM 3 & 4 port card

Weights & Dimensions

(configured with 1 HDD & 1 ODD)

Chassis (H x W x D)	13.3 x 14.9 x 3.95 in 33.8 x 37.9 x 10cm
System Volume	788 cu in 13.0 L
Packaging (H x W x D)	23.38 x 19.68 x 9.00 in 59.38 x49.99 x22.85 cm
System Weight*	15.08 lb 6.84 kg
Shipping Weight*	16.28lb 7.34kg
Max Supported Weight (desktop orientation)	77.0 lb 35.0 kg

* Exact weight depends on configuration

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.

Temperature Range	Operating: 50° to 104° F (10° to 40° C)* Non-operating: -22° to 149° F (-30° to 65° C)
Relative Humidity	Operating: 20% to 85% (non-condensing at ambient) Non-operating: 0% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)

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

Power Supply	240-watt – EPA90 power supply – Active PFC *This power supply meets ENERGY STAR compliance in conjunction with a select range of processors and modules.
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

Technical Specifications

Rated Input Current	4A Efficiency 87/90/87% at 20/50/100% load
Power Supply Fan	90 mm variable speed fan
ENERGY STAR Compliant	ENERGY STAR 6.0 compliant
Power Cord Length	6.0ft (1.8 3m)
Current Leakage (NFPA99)	< 275 µA

ROM BIOS Information

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP RP5 Retail System, Model 5810 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 RP5 Retail System, Model 5810 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 the HP RP5 Retail System, Model 5810, including BIOS updates from within DOS (Flashbin), BIOS updates from within Windows (HPQFlash), HP Client Manager, and fail-safe recovery. In addition, the HP RP5 Retail System, Model 5810 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 RP5 Retail System, Model 5810 use ACPI to provide power conservation features.
- S5 Max Power Savings setting supports EU Lot6 requirement and allows the HP RP5 Retail System, Model 5810 to power down below 1W is S5 (when turned off). When S5 Max Power Savings feature is enabled power to slots is turned off along with WOL functionality.

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 v2.7
- 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

Technical Specifications

Serviceability Features

- Dual colored power LED on front of the HP RP5 Retail System, Model 5810 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.

Additional Features

	Description
Intel® Standard Manageability	• Requires the utilization of the integrated network connection • Delivered with processors that are not part of the Intel Stable Intel Platform Program (SIPP) • Intel Advanced Management Technology (AMT) v9.0 • Basic Retail SYSTEM management capabilities such as asset inventory, HW alerting, SOL/IDE-R, remote configuration, agent presence and system defense. • DASH 1.1 compliance. Support for profile updates. • Host VPN support for local management VPN tunneling Intel Standard Manageability includes features of Intel Active Management Technology (Intel AMT). Intel AMT requires the Retail system to have an Intel AMT-

Technical Specifications

	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 http://www.intel.com/technology/platform-technology/intel-amt/.
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)	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
	VT-d is a chipset technology that virtualizes directed I/O
	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.
Computrace	Computrace agent support standard
Towerable Orientation	The chassis can be oriented as either a desktop or a tower.
Drive Protection System	DPS Access through F10 Setup during Boot
	A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user
	Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the 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
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	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
	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted
SMART I – Drive Failure Prediction	Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count
SMART II – Off-Line Data Collection	By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure
SMART III – Off-Line Read Scanning with Defect Reallocation	IOEDC: I/O Error Detection Circuitry
	Detects errors in Read/Write buffers on HDD cache RAM
SMART IV – End-to-End CRC for hard drives	Interface in F10 setup provides confirmation of SMART IV support.

High Definition Audio

Type	Integrated
HD Stereo Codec	Realtek 2-channel ALC221 codec
Audio I/O Ports	Rear Line-In/Microphone input (47-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out* (200 ohms Output Impedance, expects at least a 10-K ohm load) Line-in and Line-out, both on rear. 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 (software)	Yes – Uses OS soft wavetable
Analog Audio	Yes
# of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
Internal Speaker	Yes
External Speaker Jack (Line-Out)	Yes

Intel® I217LM GbE Network Connection (integrated)

Connector	RJ-45	
System Interface	Integrated on PCA	
Controller	Intel I217LM GbE platform LAN connect networking controller	
Memory	24 KB FIFO packet buffer memory	
Data rates supported	10/100/1000 Mbps 802.1P 802.1Q 802.2	
Compliance	802.3 802.3ab 802.az 802.3u	
Bus architecture	PCI Express and SMBus	
Data transfer mode	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)	
Power requirement	Requires 3.3V and 0.9V or just 3.3V with integrated regulators Power consumption 0.733 Watts	
Boot ROM support	Yes	
Network transfer mode	Full-duplex	
	Half-duplex (not supported for the 1000BASE-T transceiver)	
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
Environmental	Operating Temperature:	32° to 185°F (0° to 85° C)
	Operating Humidity:	60% RH
Management	WOL, auto MDI crossover, PXE, Multi-port teaming, RSS, Advanced cable diagnostic.	
Alerting	ASF 2.0 support, AMT 9.0 support	

Intel Ethernet I210-T1 GbE NIC Card

Connector	RJ-45
System Interface	PCI Express x1
Controller	Intel I210 Gigabit Ethernet Controller
Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers
Data rates supported	10/100/1000 Mbps
Compliance	IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
Bus architecture	PCI Express 2.1
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

Technical Specifications - Communications

Network transfer mode	Full-duplex	
	Half-duplex (not available for the 1000BASE-T transceiver)	
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	2.56 x 2.17 x 0.8 in (6.5 x 5.5 x 2.0 cm)	
Management capabilities	WOL, PXE, DMI, WFM 2.0	

Intel 7260 802.11 a/b/g/n PCIe x1 WLAN Card

Wireless LAN standards	IEEE 802.11a	
	IEEE 802.11b	
	IEEE 802.11g	
	IEEE 802.11n	
Interoperability	Wi-Fi certified	
	Cisco Compatible Extensions Program compliant with Microsoft Windows 7, Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)[1]	
Frequency band	802.11b/g/n 2.402 - 2.482 GHz	
	802.11 a/n	4.9 - 4.95 GHz (Japan)
		5.15 - 5.25 GHz
		5.25 - 5.35 GHz
		5.47 - 5.725 GHz
		5.825 - 5.850 GHz
Antenna structure	2 transmit; 2 receive (2x2)	
Data rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps	
	802.11b: 1, 2, 5.5, 11 Mbps	
	802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps	
	802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)	
Modulation	Direct Sequence Spread Spectrum	
	CCK, BPSK, QPSK, 16-QAM, 64-QAM	
Security[2]	• IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI	
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.	
Network architecture models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between band Access Points	
Output power[3]	2.4G: +13.5dBm minimum	

Technical Specifications - Communications

(approximately)	5G: +12dBm minimum	
Power Consumption	Transmit mode	2.0 Watts
	Receive Mode	1.6Watts
	Idle mode[4]	250mW (WLAN Associated)
	Idle mode	100 mW (WLAN unassociated)
	Radio off	75mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver sensitivity[5]	802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)	
	802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps)	
	802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps)	
	802.11n:-69 dBm (150 Mbps), -66 dBm (300 Mbps)	
Antenna connections	2 U.FL type connectors (output impedance of 50 ± 2 ohms)	
Form Factor	PCI-Express Half-MiniCard	
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)	
Weight	Approx. 0.122 lb (55.7 g)	
Operating voltage	3.3V +/- 9%	
Temperature	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED activity	LED Amber - Radio OFF; LED White - Radio ON	
OS Support	Windows 8.1 Pro (64-bit)* Windows 8.1 (64-bit)* Windows 8 Pro (64-bit)* Windows 8 (64-bit)* Windows 7 Ultimate (32-bit)** Windows 7 Ultimate (64-bit)** Windows 7 Professional (32-bit)** Windows 7 Professional (64-bit)** Windows 7 Home Premium (32-bit)** Windows 7 Home Premium (64-bit)** Novell SUSE Linux Enterprise Desktop 11***	
	*Not all features are available in all editions of Windows 8. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8 functionality. See http://www.microsoft.com. **Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details. ***Most features not available on Linux.	
Option kit contents	PCIe x1 card with full height bracket, rf antenna, antenna cable, separate low profile bracket, software CD and warranty.	

1. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.
2. Check latest software/driver release for updates on supported security features.
3. Maximum output power may vary by country according to local regulations.

Technical Specifications - Communications

4. In Power Save Polling mode and on battery power.
5. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel HD Graphics (integrated)

VGA Controller Integrated

DisplayPort Multimode capable; supports HDCP, Display Port Audio (2 streams), HBR2 link rates and Multi-Stream Technology for a maximum of 3 displays (including the integrated panel)

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

Maximum Graphics Memory	Microsoft Windows 7	Windows 8
	Up to 1.7GB	Up to 1.8GB

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

Graphics/Video API Support

- The Processor Graphics contains a refresh of the seventh generation graphics core enabling substantial gains in performance and lower power consumption. Up to 16 EU support.
- Next Generation Intel Clear Video Technology HD Support is a collection of video playback and enhancement features that improve the end user's viewing experience
  - Encode/transcode HD content
  - Playback of high definition content including Blu-ray Disc
  - Superior image quality with sharper, more colorful images
- DirectX Video Acceleration (DXVA) support for accelerating video processing
  - Full AVC/VC1/MPEG2 HW Decode
- Advanced Scheduler 2.0, 1.0
- Windows 7
- Windows 8, Linux OS Support
- DirectX 11.1
- OpenGL 4.0
- Open CL 1.2

Resolution	Refresh Rates (Hz)
800x600	60
1024x768	60
1280x600	60
1280x720	60
1280x800	60
1280x960	60
1280x1024	60
1360x768	60
1366x768	60
1440x1050	60
1440x900	60
1600x900	60
1600x1200*	60
1680x1050	60
1920x1080	60
1920x1200*	60
1920x1440*	60
2560x1440*	60

2560x1600*	60

* Only supported when using a DisplayPort connector

NVIDIA NVS 315 1GB PCIe x16 Graphics Card

Form Factor	Low Profile: 2.713 × 6.15 in
Graphics Controller	NVIDIA® NVS 315
Bus Type	PCIe x16, 2.0 Compliant
Memory	Size: 1GB, 64bit wide bus Clock: 875 MHz Memory Bandwidth: 14 GB/s
Connectors	DMS-59, with support for dual VGA, dual DVI or dual DisplayPort with the appropriate adapter cable. **NOTE:** Optional cable required for DVI and DisplayPort connectivity.
Display Max. Resolution	Up to 2048 x 1536 VGA; 1920 x 1200 DVI; 2560 x 1600 DisplayPort

Display Output	Up to 2 displays in the following configurations
	
	• Dual DVI:
	  ○ Drives two DVI displays using optional HP DMS59 DVI Dual-head Connector Cable DL139A
	• Dual DisplayPort:
	  ○ Drives two DisplayPort using optional HP DMS-59 to Dual DisplayPort kit XP688AA
	• Dual VGA:
	  ○ Drives two analog using the included HP DMS-59 to Dual VGA Cable

Supported Display Resolutions and Refresh Rates	**NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.**

Resolution	Analog Connection	Digital Connection
640x480	85	60
720x480	85	60
720x576	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x768	85	60
1280x1024	85	60
1440x900	75	60
1600x1024	85	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1440	N/A	60*
2560x1600	N/A	60*

* Display Port Only

NVIDIA NVS 510 2GB Graphics Card

Form Factor	Low Profile, 2.713 inches × 6.3 inches, single slot
Graphics Controller	NVS 510 GPU Core Clock: 797 Mhz Memory Clock: 891 Mhz CUDA Cores: 192
Bus Type	PCI Express™ x16 Generation 2.0
Memory	2GB DDR3
Connectors	Four mini-DisplayPort. Four mini-DisplayPort to DisplayPort adapters included. (DisplayPort to DVI-D, DisplayPort to VGA, DisplayPort to HDMI, and DisplayPort to Dual-Link DVI adapters available as separate accessories)
Maximum Resolution	Mini-DisplayPort connectors support ultra-high-resolution panels (up to 3840 x 2160 @ 60Hz) NOTE: This card supports up to four displays. For Windows XP, only 2 active displays are supported.
RAMDAC	Not Applicable
Image Quality Features	10-bit internal display processing, including hardware support for 10-bit scan-out
Display Output	DisplayPort with Multi-Stream Technology (MST) and High Bit Rate 2 (HBR2) support. Digital Display Support 1. DisplayPort Output • Drives four DisplayPort enabled digital display at resolutions up to 3840 × 2160 at 60 Hz with reduced blanking, when connected natively using the 4 DisplayPort connectors on the NVS 510 graphics card. • DisplayPort Multi-Stream Topology (MST) Technology: Supports various combinations of display resolutions and number of displays when using DisplayPort multi stream topology technology - up to a maximum of 4 monitors at a resolution of 1920 × 1200 at 60 Hz with reduced blanking. 2. DVI-D Output • Drives four digital displays at resolutions up to 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort to DVI-D single-link cable adaptors. • Drives four digital displays at resolutions up to 2560× 1600 at 60 Hz with reduced blanking using DisplayPort to DVI-D dual-link cable adaptors. 3. HDMI Output • The NVS 510 graphics board is capable of driving four high definition (HD) panels up to resolutions of 1920 × 1080P at 60 Hz using DisplayPort to HDMI cable adaptors. Analog Display Support 1. VGA display output • Drives four analog displays at resolutions up to 1920 × 1200 at 60 Hz using DisplayPort to VGA cable adaptors.
Supported Graphics APIs	Full Microsoft DirectX 11, Shader Model 5.0 support

Technical Specifications - Graphics

	Full OpenGL 4.3 support
Power consumption	33.4 Watts
Note	Heatsink cooler design is active

HP DisplayPort to HDMI Adapter

Connectors	DisplayPort plug and HDMI receptiacle
Adapter length	8.0 in (20.0 cm)
Adapter weight	.10 lbs (.05 kg)

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

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.

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 RP5 Retail System, Model 5810 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.

HP Solid State Drives

HP 32GB SATA Solid State Drive (2.5” with caddy)

Capacity	32,017,047,552 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s

Technical Specifications - Data Storage Drives

Logical Blocks	62,533,296
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 64GB SATA Solid State Drive (2.5” with caddy)

Capacity	63,023,063,040 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s
Logical Blocks	123,091,920
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 128GB SATA Solid State Drive (2.5” with caddy)

Capacity	128,035,676,160 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s
Buffer Size	256 MB
Logical Blocks	250,069,680
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 256GB SATA Solid State Drive (2.5” with caddy)

Capacity	256,060,514,304 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s
Buffer Size	256 MB
Logical Blocks	500,118,192
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 512GB Solid State Drive (2.5” with caddy)

Capacity	512,110,190,592 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s

Technical Specifications - Data Storage Drives

Buffer Size	512 MB
Logical Blocks	1,000,215,216
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 128GB SATA SED Solid State Drive (2.5" with caddy)

Capacity	128,035,676,160 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s
Buffer Size	256 MB
Logical Blocks	250,069,680
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 128 GB* M.2 PCIe SSD

Unformatted Capacity	128 GB*	
Architecture	NAND Flash Memory which has a high reliability and a high technology in a small form factor for using a SSD and supporting PCIe interface up to 4 lanes.	
Form Factor	PCIe SATAe Ultrathin	
Dimensions (Width x Length x Thickness)	.899 x 3.149 x .146 in (22 x 80 x 3.73 mm)	
Bandwidth Performance - Performance measured using IOMeter 2008 on Windows 8 64bit. Actual performance may vary depending on use conditions and environment.	Sustained Sequential Read (128KB):	Up to 920 MB/ss
	Sustained Sequential Write (128KB):	Up to 430 MB/s
	Random Read (4KB):	up to 8500 IOPs
	Random Write (4KB):	up to 32000 IOPs
Power	Allowable voltage	3.3V ± 5%
	Total power consumption:	5.8 W (Active) ; 80 mW; (Idle)
MTBF	1.5 M hours	
Environmental (all conditions, non-condensing)	Operating Temperature:	32° to 158° F (0° to 70° C)
	Relative Humidity (operating):	5% to 95%
	Shock:	1,500 G
Regulations	Safety TUV UL CB c-UL-us	TUV UL CB c-UL-us
	EMC/EMI	TUV CE (EU) BSMI (Taiwan) KCC (South Korea)

VCCI (Japan)
C-Tick (Austrailia)
FCC (USA)

* For solid state disk drives, GB means 1 billion bytes. Actual formatted capacity is less. Up to 16GB for Windows 7 and up to 36GB for Windows 8.1 is reserved for system recovery software. ** The product achieves a mean time between failure (MTBF) based on population statistics not relevant to individual units.

HP 256GB SATA SED Solid State Drive (2.5” with caddy)

Capacity	256,060,514,304 bytes
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 Gb/s
Buffer Size	256 MB
Logical Blocks	500,118,192
Height (nominal)	7mm
Width (nominal)	Physical size: 70mm
Operating Temperature	0° to 70° C

HP 500GB Hard Disk Drive (2.5” with caddy)

Capacity	500,107,862,016 bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	16 MB	
Logical Blocks	976,773,168	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	13 ms
	Full-Stroke:	25 ms
Height (nominal)	0.374 in/9.5 mm	
Width (nominal)	Media diameter: 2.5 in/63.5 mm	
	Physical size: 2.75 in/69.85 mm	
Operating Temperature	41° to 131° F 5° to 55° C	

HP 500GB SED Hard Disk Drive (2.5” with caddy)

Capacity	500,107,862,016 bytes
Rotational Speed	7,200 rpm
Interface	Serial ATA (SATA) 3.0
Synchronous Transfer Rate (maximum)	Up to 6 GB/s
Buffer Size	32 MB
Logical Blocks	976,773,168

Technical Specifications - Data Storage Drives

Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	13 ms
	Full-Stroke:	25 ms
Height (nominal)	0.267 in/6.8 mm	
Width (nominal)	Media diameter: 2.5 in/63.5 mm	
	Physical size: 2.75 in/69.85 mm	
Operating Temperature	41° to 131° F 5° to 55° C	

HP 500GB Hard Disk Drive (3.5”)

Capacity	500,107,862,016 bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	16 MB	
Logical Blocks	976,773,168	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
Height (nominal)	1 in/25.4 mm	
Width (nominal)	Media diameter: 3.5 in/88.9 mm	
	Physical size: 4 in/101.6 mm	
Operating Temperature	41° to 131° F 5° to 55° C	

HP 1TB Hard Disk Drive (3.5”)

Capacity	1,000,204,886,016 bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	32 MB	
Logical Blocks	1,953,525,168	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
Height (nominal)	1 in/25.4 mm	
Width (nominal)	Media diameter: 3.5 in/88.9 mm	
	Physical size: 4 in/101.6 mm	
Operating Temperature	41° to 131° F 5° to 55° C	

Technical Specifications - Data Storage Drives

HP 2TB Hard Disk Drive (3.5”)

Capacity	2,000,409,772,032 bytes	
Rotational Speed	7,200 rpm	
Interface	Serial ATA (SATA) 3.0	
Synchronous Transfer Rate (maximum)	Up to 6 GB/s	
Buffer Size	64 MB	
Logical Blocks	3,907,050,336	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track:**	2.0 ms
	Average:	11 ms
	Full-Stroke:	21 ms
Height (nominal)	1 in/25.4 mm	
Width (nominal)	Media diameter: 3.5 in/88.9 mm	
	Physical size: 4 in/101.6 mm	
Operating Temperature	41° to 131° F 5° to 55° C	

HP Removable SATA Hard Drive Enclosure

Introduction

The HP Removable Hard Drive Enclosure supports up to 3 Gb/s SATA transfer rates along with Gold DIN connectors that are rated for 30,000 insertions and removals. Robust all-metal construction provides superior cooling while protecting the hard drive during transportation and storage. A powered key lock prevents theft or accidental removal during operation and a temperature sensing fan ensures sufficient airflow across the hard drive based on workload.

The HP Removable SATA Hard Drive Enclosure consists of two components; a receiving frame and a removable drive carrier. Install the receiving frame into the 5.25" optical storage bay and then relocate your primary system hard drive or secondary hard drive to the removable drive carrier. Then insert the drive carrier into the receiving frame and you have a fully configured removable hard drive.

Interface Type	Compatible with 3.5” SATA controllers
Dimensions (W x L x H)	5.73 x 7.87 x 1.61 in (14.6 x 20 x 4.1 cm)
Weight	1.56 lbs (707 g) (not including hard drive)

HP DX115 Removable Drive Enclosure

Introduction

The HP DX115 Removable Enclosure is a rugged drive carrier and receiving frame for internally mounting a SATA hard drive into the 5.25 inch optical drive bay in the HP RP5 Retail System.

The DX115 supports one 3.5" SATA (Serial ATA) hard disk drive.

- HP DX115 Removable HDD Frame/Carrier - A receiving frame and carrier for a SATA hard disk drive. The receiving frame installs in one of the 5.25" optical bays in the HP RP5 Retail System. The carrier holds the HDD and has a quick release handle for insertion/removal. You can install any HP supported 3.5" disk in the carrier.
- HP DX115 Removable HDD Carrier - Use this carrier for adding spare or additional drives. Hard Drive purchased separately.

Technical Specifications - Data Storage Drives

Performance and Features

Enclosure with centered drive carrier ensures no interference with the system bezel. Drive spin/power up/down button. Power, spin & fan failure indicator. Drive activity indicator (system-dependent). "Soft Start" circuitry & anti-static device protection. Cable-less drive connector. Rugged construction; drive is protected in the event of physical trauma. Mating connectors provide 25K insertion rating for multiple insertions and removals. Integrated fan assures proper drive cooling. Key lock functions independently from drive power

Interface Type	Compatible with 3.5” SATA controllers
Dimensions (W x H x D)	147.6mm W x 41.1mm H x 205mm L (5.81” W x 1.62” H x 8.08” L)
Weight	Frame and Carrier: 1.73 kg (3.8 lbs) Carrier: 0.45 kg (1 lbs)

HP DVD-ROM Drive

Height	5.25-inch, half-height, tray-load		
Orientation	Either horizontal or vertical		
Interface type	SATA/ATAPI		
Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
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)		
Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 8X	
	DVD-ROM	Up to 16X	
	DVD-RAM	Up to 5X	
	CD-ROM, CD-R	Up to 40X	
	CD-RW	Up to 32X	
Removable Storage - Media Compatibility - DVD-ROM	**Media**	**Read**	**Write**
	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
Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	Cache Buffer	2 MB (minimum)	
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
Power	**Source**	SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	

Technical Specifications - Input/Output Devices

	DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC -< 600 mA typical, < 1400 mA maximum
Environmental (all conditions 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 USB Standard Keyboard for Retail

Physical characteristics	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
	Weight	2 lb (0.9 kg) minimum
Electrical	**Operating voltage**	+ 5VDC ± 5%
	Power consumption	50-mA maximum (with three LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI - RFI	Conforms to FCC rules for a Class B computing device
	Microsoft® PC 99 - 2001	Functionally compliant
Mechanical	**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
Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration

Technical Specifications - Input/Output Devices

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

HP PS/2 Standard Keyboard for Retail

Physical characteristics	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
	Weight	2 lb (0.9 kg) minimum
Electrical	**Operating voltage**	+ 5VDC ± 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
	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
Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration

	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	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 PS/2 Optical Mouse

Dimensions (H x L x W)	1.46 x 2.48 x 4.53 in (3.70 x 6.29 x 11.50 cm)	
Weight	3.53 oz (100g; +10g/- 5 g)	
Environmental	**Operating temperature**	32° to 104°F (0° to 40° C)
	Non-operating temperature	-4° to 140°F (-20° to 60° C)
	Operating humidity	10% to 90% (non condensing at ambient)
	Non-operating humidity	10% to 90% (non condensing)
	Operating shock	40 g, 6 surfaces
	Non-operating shock	80 g, 6 surfaces
	Operating vibration	2 g peak acceleration
	Non-operating vibration	4 g peak acceleration
	Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face
Electrical	**Operating voltage**	5 VDC ± 10%
	Power consumption	100mA
	System consumption	PS/2 mini-din connector
	ESD	CE level 4, 15 kV air discharge
	EMI-RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC99 - 2001	Functionally compliant
Mechanical	**Resolution**	800 DPI
	Tracking speed	10 in/s (25.4 cm/s) maximum
	Acceleration	± 15%
	Switch actuation	65±20 gf
	Switch life	3,000,000 operations (using Hasco modified tester)
	Switch type	Low force micro-switches
	Tracking mechanism life	80km
	Cable length	6 ft (1.8 m)

Technical Specifications - Input/Output Devices

	Microsoft PC99 - 2001	Mechanically compliant
Scroll wheel	**Width**	6 mm
	Diameter	22.5 ± 0.2 mm
	Maximum rotation speed	50 gf-cm
	Switch type	Light force micro-switch
	Switch life	1 million operations
	Mechanical life	Max 200,000 revolutions
Regulatory Approvals	UL/cUL, FCC, CE Mark, TUV/GS, VCCI, KCC, BSMI, C-Tick	
Compatibility	**Operating system support**	Windows 8, Windows 8 Pro, Windows 7, Windows 7 Professional, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32* (no driver is required for this device. Native support is provided by the operating system.), xpe, ce.net, Linux, XP-64 *Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit **http://www.windowsvista.com/upgradeadvisor**. For Windows Vista system requirements, visit http://www.windowsvista.com/systemrequirements.

HP USB Optical Mouse

Dimensions (H x L x W)	1.5x 4.5 x 2.5 in (3. 7x 11.5 x 6.3 cm)
Weight	0.22 lb (0.10 kg) (Typical weight with cable)
Cable length	70.9 in (180 cm)
System requirements	Windows 8, Windows 8 Pro, Windows 7, Windows 7 Professional, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32* (No driver is required for this device. Native support is provided by the operating system.), xpe, ce.net, Linux, XP-64

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 registered in the United States. See http://www.epeat.net for registration status in your country.

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

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 (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.7	28
Fixed Disk (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

Battery size: CR2032 (coin cell)
Battery type: Lithium

Technical Specifications - Environmental Data

Additional information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold 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 7.5% post consumer recycled plastic (by wt.)
- This product is 91.3% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
  - Corrugated – 1320 g
- Internal:
  - Polyethylene low density foam – 196 g
- The corrugated packaging material varies in recycled content:
  - North America – at least 25% recycled content
  - Asia – at least 62% recycled content (Singapore at least 80%)
  - Europe – at least 50% recycled content
- The Polyethylene low density Foam packaging material varies in recycled content:
  - North America – 100% (Pre-consumer or Post-industrial)
  - Asia – 10%
  - Europe – 7%

RoHS Compliance

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

Material Usage

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

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

- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)
- Nickel finishes that release greater than 0.5 micro-grams/cm^2/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

After-Market Options (availability may vary by region)

Communication Devices

	Part #
Broadcom NetXtreme Gigabit Ethernet Plus NIC	FS215AA
Intel Ethernet I210-T1 GbE NIC	E0X95AA
Intel 7260 802.11 a/b/g/n PCIe x1 WLAN Card	F2P07AA

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

Graphics Solutions

	Part #
NVIDIA NVS 315 1GB Graphics Card	E1U66AA
NVIDIA NVS 510 2GB Graphics Card	C2J98AA
HP DMS59 DVI Dual-head Connector Cable	DL139A
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
HP USB Graphics Adapter	NL571AA

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 128GB Solid State Drive	QV063AA
128GB M.2 PCIe SSD	J8W51AV
HP DX115 Removable HDD Frame/Carrier	FZ576AA
HP DX115 Removable HDD Carrier	NB792AA
HP Removable SATA Hard Drive Enclosure (frame & carrier)	RY102AA
HP Removable SATA Hard Drive Enclosure (carrier only)	RY103AA

Input / Output Devices

	Part #
HP PS/2 Standard Keyboard for Retail	J4A10AA
HP USB Standard Keyboard for Retail	J4A11AA
HP 2-port Powered Serial Port Card	QP906AA
HP 12V PUSB Entry Card	QP905AA
HP PS/2 Optical Mouse	QY775AA
HP USB Optical Mouse	QY777AA

System Memory

	Part #

After-Market Options (availability may vary by region)

HP 4GB DDR3-1600 MHz DIMM	B4U36AA
HP 8GB DDR3-1600 MHz DIMM	B4U37AA

Multimedia Devices

	Part #
HP DVD-ROM Drive	AR629AA
HP SuperMulti Drive	QS208AA
HP Blu-ray Writer Drive	B4F70AA

Security Devices

	Part #
HP Chassis Security Kit	AR639AA
HP Business PC Security Lock	PV606AA
HP Wall Mount/Security Sleeve	VN570AA

Accessories

	Part #
HP rp5800 Trim Bezel – with ODD Opening	QP910AA
HP Integrated Work Center Stand	QP897AA
HP Tower Stand	VN569AA
HP Serial Port Adapter	PA716A
HP Parallel Port Adapter	KD061AA
HP Rear Port / Cable Control Cover	QP909AA

Retail Solutions Specific Accessories

	Part #
HP Standard Duty Cash Drawer	QT457AA
HP USB Standard Duty Cash Drawer	E8E45AA
HP Heavy Duty Cash Drawer	FK182AA
HP Flip-Top Cash Drawer	BW867AA
HP Till with Locking Cover	QT458AA
HP Flip-Top Till with Locking Cover	BZ335AA
HP Imaging Barcode Scanner	BW868AA
HP Imaging Barcode Scanner 7-foot Cable	BZ337AA
HP Linear Barcode Scanner	QY405AA
HP Presentation Barcode Scanner	QY439AA
HP Wireless Barcode Scanner	E6P34AA
HP POS Pole Display	FK225AA
HP Graphical Pole Display	QZ704AA
HP Mini MSR with Brackets	FK186AA
HP POS Keyboard without MSR	FK221AA
HP POS Keyboard with MSR	FK218AA
HP Powered USB Thermal Receipt Printer	FK224AA
HP Serial/USB Thermal Receipt Printer	BM476AA

After-Market Options (availability may vary by region)

HP Hybrid POS Printer with MICR	FK184AA
Epson H6000IV Hybrid POS Printer	D9Z51AA
Epson T88V PUSB Receipt Printer	E1Q93AA
EpsonT88V Serial USB Receipt Printer	D9Z52AA
HP Value PUSB Receipt Printer	F7M67AA
HP Value Serial/USB Receipt Printer	F7M66AA
HP USB Y Cable (for Serial USB Receipt Printer)	BM477AA
HP Cable Pack for Dual Cash Drawers	QT538AA
HP L5006tm 15-inch LCD (SAW) Touchscreen Monitor	RB146AA
HP L5009tm 15-inch LCD (APR) Touchscreen Monitor	VK202AA
HP L1506x 15-inch LED Monitor (Non-Touchscreen)	LL543AA
HP L6010 10.4-inch Monitor (Non-Touchscreen)	A1X76AA
HP Dual Position Stand for L6010	A1X79AA
HP L6015tm 15-inch (PCAP) Touchscreen Monitor	A1X78AA
HP L6017tm 17-inch (PCAP) Touchscreen Monitor	A1X77AA
HP Height Adjusting Stand for L6015/17tm	A1X81AA
HP Integrated Barcode Scanner	E1L07AA
HP Retail Integrated Fingerprint Reader	QZ672AA
HP Retail Integrated Webcam	QZ673AA
HP Retail Integrated Dual-Head MSR	QZ700AA
HP rp5800 Terminal Enclosure Assembly	QQ971AA
HP rp5800 Integration Tray Assembly	QQ972AA
HP Display Pole Mount Assembly	QQ973AA
HP Optional Display Arm Assembly	QQ974AA

Summary of Changes

Date of change:	Version History:		Description of change:
May 16, 2014	V7 May	Changed	
		Added	Add document ID to footnotes section, LCD Pole Display and 7-in CFD
December 8, 2014	From v7 to v8	Added	Intel Core i3-4150, 128GB M.2 PCIe SSD

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