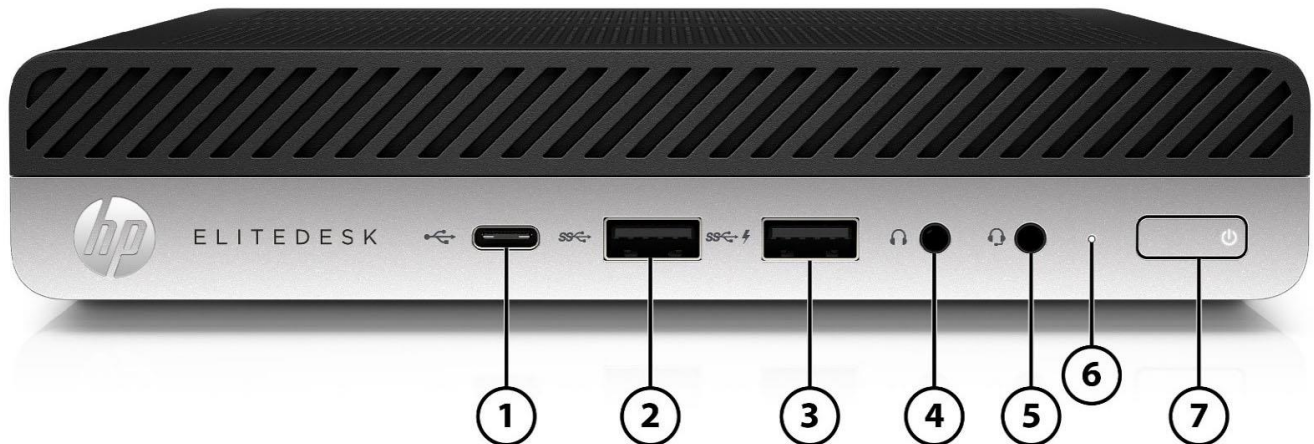


Overview

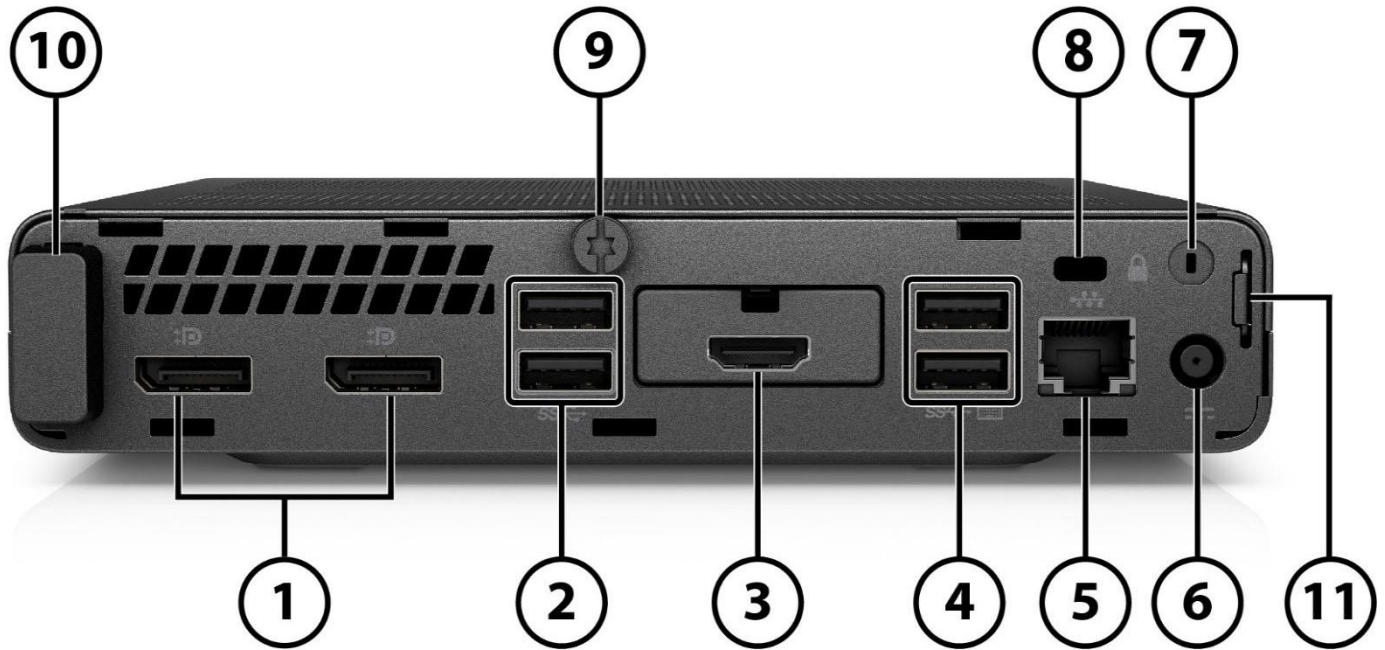
HP Collaboration PC G4



1. USB Type-C™ 3.1 Gen 2 Port with Fast Charging
2. USB 3.1 Gen 2 Type A
3. USB 3.1 Gen 1 Type A (charging port)
4. Headphone connector
5. Universal Audio Jack with CTIA headset support
6. Hard Drive activity light
7. Dual-state power button

Overview

HP Collaboration PC G4



- | | | | |
|----|--|-----|--------------------------------|
| 1. | DisplayPort™ 1.2 | 7. | WLAN External Antenna Punchout |
| 2. | USB 3.1 Gen 2 (10GBits/s) Type A | 8. | Universal Cable Lock Slot |
| 3. | Configurable Option card slot. | 9. | Cover Release Thumbscrew |
| 4. | USB 3.1 Gen 1 (5GBits/s) Type A ¹ | 10. | WLAN Internal Antenna |
| 5. | RJ-45 Network Adapter | 11. | Padlock Loop |
| 6. | Power connector | | |

Not Shown

- Slots (1) Internal M.2 2230 connector for WLAN
 (2) Internal M.2 SSD storage (2230 or 2280 connector)

- Bays (1) 2.5- inch SATA drive Bay

Mounting Support for

- VESA Sleeve
- Quick Release Bracket
- B300/B500 Mounting bracket

1. Allows for wake from S4/S5 with keyboard/mouse when connected and enabled in BIOS

Overview

AT A GLANCE

- Intel® Q370 chipset supporting Intel® 8th generation Core™ processors, featuring integrated Intel® UHD Graphics and Intel® vPro™ Technology (available with Core i5 and Core i7 processors) ^{1,4}
- Processors up to 95W
- Intel® UHD graphics as well as optional discrete graphics
- Intel® Ethernet Connection I219LM GbE LOM integrated network connection
- DDR4 Synchronous Dynamic Random Access Memory (SDRAM) (Transfer rates up to 2666 MT/s)
- Support for up to three monitors via two standard DisplayPort™ 1.2 connectors and an optional third video port connector which provides the following choices: HDMI 2.0a, VGA, DisplayPort™ 1.2, or USB Type-C™ with DisplayPort™ 1.2 for all platforms; USB Type-C™ with DisplayPort™ 1.2 and Power Delivery (PD)²
- Configurable 3rd rear I/O with video port (HDMI, DisplayPort™ 1.2, VGA, Type-C™ with DisplayPort™ 1.2) or Thunderbolt 3.0
- Intel® Unite™ Solution available
- Selection of discrete graphic cards to configure systems to up to 7 displays²
- Models can be configured with multiple data drives in a RAID array
- Enhanced Security With:
 - HP Sure Click
 - HP Sure Start Gen4
 - HP Sure Run
 - HP Sure Recover
 - HP Manageability Integration Kit
 - HP WorkWise
 - HP BIOSphere Gen4
 - HP Client Security Manager Gen4
 - Notification with HP Image Assistant Gen3
- Multifactor Authentication features include fingerprint reader (optional) and IR webcam (optional) both Windows Hello certified
- High efficiency energy saving power supply options
- ENERGY STAR® certified. EPEAT® Gold registered where applicable/supported. Registration may vary by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.
- CCC, CECP and SEPA Certified
- PC chassis and all internal components and modules are manufactured with low halogen content ³
- Protected by HP Services, including limited warranties up to 3-3-3 (terms and conditions vary by country; certain restrictions and exclusions apply); Care Packs available with up to 5 years Next Business Day Onsite Hardware Support

1. 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. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance

2. DisplayPort™ multi-stream monitors 'daisy-chained' together.

3. External power supplies, power cords, cables and peripherals are not low halogen. Service parts obtained after purchase may not be low halogen.

4. Some functionality of vPro technology, such as Intel Active management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel vPro technology is dependant on 3rd party software providers. Compatibility of this generation of Intel vPro technology-based hardware with future "virtual appliances" is yet to be determined."

NOTE: See important legal disclosures for all listed specs in their respective features sections

Standard Features and Configurable Modules

OPERATING SYSTEMS

Preinstalled

Windows® 10 Pro 64¹

Windows® 10 Pro 64 (National Academic License)²

Windows® 10 Home 64¹

Windows® 10 Home Single Language 64¹

FreeDos 2.0

Web-supported only

Windows® 10 Enterprise 64¹

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com/>

2. Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see <https://aka.ms/ProEducation> for Windows 10 Pro Education feature information.

NOTE: Your product does not support Windows 8 or Windows 7

In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows® 8 or Windows 7 drivers on <http://www.support.hp.com>

CHIPSET

Intel® Q370 PCH-H- vPro™

Standard Features and Configurable Modules

PROCESSORS

Intel® 8th Generation Core™ Processors

Intel® Core™ i7 8700K processor with Intel® UHD Graphics 630 (up to 3.7GHz, 12 MB cache, 6 cores) 95W¹
Supports Intel® vPro™ Technology⁴

Intel® Core™ i7+ 8700K processor (Core i7 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630
(2.4 GHz, up to 3.7GHz with Intel® 12 MB cache, 6 cores)^{1,2} Supports Intel® vPro™ Technology⁴

Intel® Core™ i7 8700 processor with Intel® UHD Graphics 630
(3.2 GHz, up to 4.6 GHz with Intel® Turbo Boost, 12 MB cache, 6 cores)^{1,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i7+ 8700 processor (Core i7 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630
(3.2 GHz, up to 4.6 GHz with Intel® Turbo Boost, 12 MB cache, 6 cores)^{1,2,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i7 8700T processor with Intel® UHD Graphics 630
(2.4 GHz, up to 4 GHz with Intel® Turbo Boost, 12 MB cache, 6 cores)^{1,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i7+ 8700T processor (Core i7 and 16 GB Intel® Optane™ Memory) with Intel® UHD Graphics 630
(2.4 GHz, up to 4.0 GHz with Intel® 12 MB cache, 6 cores)^{1,2} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5 8600K processor with Intel® UHD Graphics 630
(up to 3.6GHz, 9 MB cache, 6 cores) 95W¹ Supports Intel® vPro™ Technology⁴

Intel® Core™ i5+ 8600K processor (Core i5 and 16GB Intel® Optane™ memory) with Intel® HD Graphics 630
(3.1 GHz, up to 4.3 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,2,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5 8600 processor with Intel® UHD Graphics 630
(3.1 GHz, up to 4.3 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5+ 8600 processor (Core i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630
(3.1 GHz, up to 4.3 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,2,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5 8500 processor with Intel® UHD Graphics 630
(3.0 GHz, up to 4.1 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5+ 8500 processor (Core i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630
(3.0 GHz, up to 4.1 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,2,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5 8500T processor with Intel® UHD Graphics 630
(2.1 GHz, up to 3.5 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5+ 8500T processor (Core i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630
(2.1 GHz, up to 3.5 GHz with Intel® 9 MB cache, 6 cores)^{1,2} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5 8600T processor with Intel® UHD Graphics 630
(2.3 GHz, up to 3.7 GHz with Intel® Turbo Boost, 9 MB cache, 6 cores)^{1,3} Supports Intel® vPro™ Technology⁴

Intel® Core™ i5+ 8600T processor (Core i5 and 16 GB Intel® Optane™ memory) with Intel® UHD Graphics 630
(2.3 GHz, up to 3.7 GHz with Intel® 9 MB cache, 6 cores)^{1,2} Supports Intel® vPro™ Technology⁴

Intel® Core™ i3 8300 processor with Intel® UHD Graphics 630 (3.7 GHz, 8 MB cache, 4 cores)¹

Intel® Core™ i3 8100 processor with Intel® UHD Graphics 630 (3.6 GHz, 6 MB cache, 4 cores)¹

Intel® Core™ i3 8100T processor with Intel® UHD Graphics 630 (3.1 GHz, 6 MB cache, 4 cores)¹

Intel® Core™ i3 8300T processor with Intel® UHD Graphics 630 (3.2 GHz, 8 MB cache, 4 cores)¹

Intel® 8th Generation Pentium® Processors

Intel® Pentium® Gold G5600 processor with Intel® UHD Graphics 630 (3.9 GHz, 4 MB cache, 2 cores)¹

Intel® Pentium® Gold G5500 processor with Intel® UHD Graphics 630 (3.8 GHz, 4 MB cache, 2 cores)¹

Intel® Pentium® Gold G5400 processor with Intel® UHD Graphics 610 (3.7 GHz, 4 MB cache, 2 cores)¹

Intel® Pentium® Gold G5400T processor with Intel® UHD Graphics 610 (3.1 GHz, 4 MB cache, 2 cores)¹

Intel® Pentium® Gold G5500T processor with Intel® UHD Graphics 630 (3.2 GHz, 4 MB cache, 2 cores)¹

Standard Features and Configurable Modules

Intel® 8th Generation Celeron™ Processors

Intel® Celeron® G4900 processor with Intel® UHD Graphics 610 (3.1 GHz, 2 MB cache, 2 cores)¹

Intel® Celeron® G4900T processor with Intel® UHD Graphics 610 (2.9 GHz, 2 MB cache, 2 cores)¹

Intel® Celeron® G4920 processor with Intel® UHD Graphics 610 (3.2 GHz, 2 MB cache, 2 cores)¹

1: 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. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

2. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system and requires configuration with an optional Intel® Core™ i(5 or 7)+ processor.

3. Intel® Turbo Boost technology requires a PC with a processor with Intel Turbo Boost capability. Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.

4. Some functionality of vPro technology, such as Intel Active management technology and Intel® Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel vPro technology is dependant on 3rd party software providers. Compatibility of this generation of Intel vPro technology-based hardware with future "virtual appliances" is yet to be determined."

GRAPHICS

Integrated Intel® Graphics

Intel® UHD Graphics 630 (integrated on 8th gen Core i7/i5/i3, Pentium® Gold G5600, G5500)

Intel® UHD Graphics 610 (integrated on 8th gen Pentium® Gold G5400, Celeron® G4900)

Optional Discrete Graphics Solutions

AMD® Radeon™ RX560 4GB GDDR⁶

Adapters and Cables

HP DisplayPort™ Cable

HP DisplayPort™ to DVI-D Adapter

HP DisplayPort™ to HDMI 4K Adapter

HP DisplayPort™ to VGA Adapter

HP USB-C™ to USB 3.0

HP USB to Serial Port Adapter

6. HD content required to view HD images.

Standard Features and Configurable Modules

STORAGE

2.5 inch SATA Hard Disk Drives (HDD)

500GB 7200RPM 2.5in SATA HDD

1TB 7200RPM 2.5in SATA HDD

2TB 5400RPM 2.5in SATA HDD

500GB 7200RPM 2.5in Self Encrypted OPAL2 SATA HDD

500GB 7200RPM 2.5in Self Encrypted Federal Information Processing Standard SATA HDD

2.5 inch SATA Solid State Hybrid Drives (SSHD)

500GB 5400RPM 2.5in SATA SSHD

1TB 5400RPM 2.5in SATA SSHD

2TB 5400RPM 2.5in SATA SSHD

2.5 inch Solid State Drives (SSD)

128GB 2.5in SATA Three Layer Cell SSD

256GB 2.5in SATA Three Layer Cell SSD

512GB 2.5in SATA Three Layer Cell SSD

256GB 2.5in SATA Self Encrypted OPAL2 Three Layer Cell SSD

512GB 2.5in SATA Self Encrypted OPAL2 Three Layer Cell SSD

256GB 2.5in SATA Self Encrypted Federal Information Processing Standard SSD

512GB 2.5in SATA Self Encrypted Federal Information Processing Standard SSD

M.2 PCIe NVMe Solid State Drives (SSD)

128GB M.2 2280 PCIe NVMe SSD

256GB M.2 2280 PCIe NVMe SSD

512GB M.2 2280 PCIe NVMe SSD

128GB M.2 2280 PCIe NVMe Three Layer Cell SSD

256GB M.2 2280 PCIe NVMe Three Layer Cell SSD

512GB M.2 2280 PCIe NVMe Three Layer Cell SSD

1TB M.2 2280 PCIe NVMe Three Layer Cell SSD

256GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell SSD

512GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell SSD

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Standard Features and Configurable Modules

MEMORY

DDR4-2666 (Transfer rates up to 2666 MT/s), 32 GB, 2 SODIMM

Memory Configuration

4 GB (1 x 4 GB)

8 GB (2 x 4 GB)

8 GB (1 x 8 GB)

16 GB (2 x 8 GB)

16 GB (1 x 16 GB)

32 GB (2 x 16 GB)

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

Memory modules support data transfer rates up to 2666 MT/s; actual data rate is determined by the system's configured processor. See processor specifications for supported memory data rate.

NOTE: All memory slots are customer accessible / upgradeable.

NETWORKING/COMMUNICATIONS

Ethernet (RJ45)

Intel® I219-LM Gigabit Network Connection LOM (standard)

Wireless¹

Intel® 9560 802.11AC 2x2 with Bluetooth® M.2 Combo Card vPro™

Intel® 9560 802.11AC 2x2 with Bluetooth® M.2 Combo Card non-vPro™

Intel® 7265 802.11AC 2x2 with Bluetooth® M.2 Combo Card non-vPro™ (Brazil)

Intel® 7265 802.11AC 2x2 M.2 Combo Card non-vPro™ with external antenna (Brazil)

1. Wireless access point and Internet service required and not included. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices

Standard Features and Configurable Modules

KEYBOARDS/POINTING DEVICES/BUTTONS AND FUNCTIONS KEYS

Keyboard

- HP USB Conferencing Keyboard
- HP Wireless Collaboration Keyboard
- HP USB and PS/2 Washable Keyboard
- HP USB Smart Card (CCID) Keyboard
- HP USB Business Slim Keyboard
- HP USB Keyboard
- HP PS/2 Keyboard

Mouse

- HP PS/2 Mouse
- HP USB Optical Mouse
- HP USB Premium Mouse
- HP USB 1000dpi Laser Mouse
- HP USB and PS/2 Washable Mouse
- Antimicrobial USB Mouse¹
- HP USB Hardened Mouse¹

1. Not available in all regions

SECURITY

Trusted Platform Module (TPM) 2.0 (Infineon SLB9670). Common Criteria EAL4+ Certified. FIPS 140-2 Level 2 Certified

Intrusion Sensor (integrated in the PCA, can be enabled/disabled through BIOS)

Support for chassis cable lock devices

Support for chassis padlocks devices

SATA port disablement (via BIOS)

Serial, USB enable/disable (via BIOS)

Intel® Identify Protection Technology (IPT)¹

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

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

Removable media write/boot control

Power-on password (via BIOS)

Setup password (via BIOS)

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

Standard Features and Configurable Modules

PORTS

I/O Ports – Standard

| | |
|-----------------------|---|
| USB 3.1 Gen 1 | 1 front, 2 rear |
| USB 3.1 Gen 2 | 1 front, 2 rear |
| USB Type-C™ 3.1 Gen 2 | 1 front; 1 rear (option) |
| Video | 2 DisplayPort™ 1.2 (rear) 1 Configurable video port (rear) (Choice of DisplayPort™ 1.2, HDMI™ 2.0, VGA, or USB Type-C™ with alt mode display port and power delivery) For models with discrete graphics: 1 DisplayPort™ 1.4 (rear) |
| Audio | 1 Headphone (front), 1 Universal Audio Jack with CTIA headset support (front)) |
| Network Interface | RJ45 |

I/O Ports – Optional

| | |
|-----------------|------------------|
| Serial (RS-232) | 1 (rear)(option) |
|-----------------|------------------|

I/O Ports – Internal Ports

| | |
|--|---|
| Internal SATA storage connector (Data and Power) | 1 |
|--|---|

Slots

| | |
|----------|--|
| M.2 PCIe | 1 M.2 PCIe x1 2230 (for WLAN) 2 M.2 PCIe x4 2280/2230 Combo (for storage) |
|----------|--|

Bays

| | |
|-----------------------------|---|
| 2.5" Internal Storage Drive | 1 |
|-----------------------------|---|

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

BIOS

- HP BIOSphere Gen4²
- HP DriveLock & Automatic DriveLock
- BIOS Update via Network
- Master Boot Record Security
- Power On Authentication
- HP Secure Erase³
- Absolute Persistence Module⁴
- Pre-boot Authentication
- HP Wireless Wakeup

Standard Features and Configurable Modules

Software

HP Native Miracast Support¹
HP Velocity
HP ePrint Driver + JetAdvantage⁵
HP Hotkey Support - CMIT
HP Recovery Manager
HP Jumpstart
HP Support Assistant⁶
HP Noise Cancellation Software
HP WorkWise¹⁹
HP PhoneWise¹³
Intel® Unite™ Solution
Buy Office (sold separately)

Manageability Features

HP Driver Packs⁷
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen2⁸
Ivanti Management Suite⁹

Client Security Software

HP Client Security Suite Gen4¹⁰ including:
HP Security Manager¹² (including Credential Manager, HP Password Manager, HP Spare Key)
HP Device Access Manager
HP Power On Authentication
Microsoft Defender¹²

Security Management

HP Secure Erase¹⁸
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)¹⁵
SATA 0,1 port disablement (viaBIOS)
RAID configurations¹⁶
Serial, USB enable/disable (viaBIOS)
Power-on password (viaBIOS)
Setup password (viaBIOS)
Support for chassis padlocks and cable lock devices
Integrated hood sensor
HP Sure Click²⁰
HP Sure Start Gen4¹⁴
HP Sure Run¹⁷
HP Sure Recover¹⁸

Standard Features and Configurable Modules

1. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming
2. HP BIOSphere Gen4 requires Intel® or AMD® 8th Gen processors. Features may vary depending on the platform and configurations.
3. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method.
4. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
5. HP ePrint Driver requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter). Print times and connection speeds may vary.
6. HP Support Assistant requires Windows and Internet access.
7. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
8. HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement>.
9. Ivanti Management Suite subscription required.
10. HP Client Security Suite Gen4 requires Windows and Intel® or AMD® 8th generation processors.
11. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
12. Microsoft Defender Opt in and internet connection required for updates.
13. HP PhoneWise Client is only available on select platforms. For supported platforms and HP PhoneWise system requirements see <http://www.hp.com/go/HPPhoneWise>.
14. HP Sure Start Gen4 is available on HP EliteBook products equipped with Intel® 8th generation processors
15. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).
16. RAID configuration is optional and does require a second hard drive.
17. HP Sure Run is available on HP Elite products equipped with 8th generation Intel® or AMD® processors.
18. HP Sure Recover is available on HP Elite PCs with 8th generation Intel® or AMD® processors and requires an open, wired network connection. Not available on platforms with multiple internal storage drives, Intel® Optane™. You must back up important files, data, photos, videos, etc. before use to avoid loss of data.
19. HP WorkWise smartphone app is available as a free download on Google Play.
20. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer, Google Chrome, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode. Check <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0922ENW> for all compatible platforms as they become available.

ENVIRONMENTAL & INDUSTRY

EPEAT® registered where applicable/supported. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.
Low halogen (chassis, all internal components and modules)¹
TAA compliant models available

1. External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

Standard Features and Configurable Modules

UNIT ENVIRONMENT AND OPERATING CONDITIONS

General Unit Operating Guidelines

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

| | |
|-------------------------------------|---|
| Temperature Range | Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F (-30° to 60° C) |
| Relative Humidity | Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient) |
| Maximum Altitude (unpressurized) | Operating: 5000m Non-operating: 50000ft (15240 m) |

1. 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.

SERVICE AND SUPPORT

On-site Warranty¹: Three-year (3-3-3) limited warranty delivers three years of on-site, next business day² service for parts and labor and includes free support 24 x 7³. Three-year onsite and labor are not available in all countries. Service offers terms up to 5 years by choosing an optional HP Care Pack. To choose the right level of service for your HP product, visit HP Care Pack Central: <http://www.hp.com/go/cpc>.⁴

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

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

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

4. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit www.hp.com/go/cpc. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Standard Features and Configurable Modules

CERTIFICATION AND COMPLIANCE

ENERGY STAR® certified; EPEAT® Gold ¹

1. EPEAT® registered where applicable. EPEAT registration varies by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.

PROCESSORS

Intel® 8th Generation Core™ Processors

All HP Collaboration PC G4 models featuring this technology include processors that are part of the Intel® Stable Image Platform Program (SIPP) designed to ensure the stability promise inherent in the value proposition of the HP Collaboration PC G4, thus making these models the most stable, secure, and manageable platforms available to enterprises today.

Intel® Advanced Management Technology (AMT) v12 – 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 12 includes the following advanced management functions:

- Support for configuration of Intel® AMT 12.0 new capabilities
- No reset after provisioning
- Support changes to BIOS table 130
- Support for Microsoft Windows Server 2012 R2
- Support for New Microsoft SQL Server Versions including Standard and Enterprise editions
- Support for Intel® SSD Pro 2500 Series
- Support for Intel® Enterprise Digital Fence
- The Platform Discovery Utility can now discover these additional Intel® products:
 - Intel® SSD Pro 2500 Series; Enterprise Digital Fence
 - Intel® Identity Protection Technology with One Time Password; Public Key Infrastructure; Multi Factor Authentication
 - Intel® Identity Protection Technology with Intel® WiGig
- New Profile Editor and Profile Editor Plugin Interface
- New Required Permissions for Solutions Framework

Technical Specifications - Graphics

GRAPHICS

Intel® UHD Graphics (integrated)

| | |
|--------------------------------------|---|
| Graphics Controller | Integrated |
| DisplayPort 1.2™ | Multimode capable; supports HDCP, Display Port Audio (2 streams), HBR2 link rates and Multi-Stream Technology for a maximum of 3 displays connected to any output controlled by Intel® Graphics |
| HDMI (optional) | Supports HDMI 2.0a features Supports HDCP 2.2 Supports audio over HDMI |
| VGA (optional) | VGA output |
| USB-C™ DP Alt Mode (optional) | DisplayPort™ over the optional USB-C™ module |
| Memory | The actual amount of maximum graphics memory can be >4GB. System memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use. |
| Maximum Color Depth | Up to 10 bits/color |
| Graphics/Video API Support | HEVC 10b Enc/Dec HW VP9 10b Dec HW HDR Rec. 2020 DX12 |

Technical Specifications – Storage

STORAGE

500 GB 7200RPM 2.5in SATA HDD

| | |
|------------------------------|-----------------------------|
| Capacity | 500 GB |
| Rotational Speed | 7,200 rpm |
| Interface | SATA 6 Gb/s |
| Buffer Size | 16 MB |
| Logical Blocks | 976,773,168 |
| Seek Time | 12 ms (Average) |
| Height | 0.267 in/6.8 mm (nominal) |
| Width (nominal) | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

1 TB 7200RPM 2.5in SATA HDD

| | |
|------------------------------|-----------------------------|
| Capacity | 1 TB |
| Rotational Speed | 7,200 rpm |
| Interface | SATA 6 Gb/s |
| Buffer Size | 32 MB |
| Logical Blocks | 1,953,525,168 |
| Seek Time | 12 ms (Average) |
| Height | 0.374 in/9.5 mm (nominal) |
| Width (nominal) | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

2 TB 5400RPM 2.5in SATA HDD

| | |
|------------------------------|-----------------------------|
| Capacity | 2 TB |
| Rotational Speed | 5,400 rpm |
| Interface | SATA 6 Gb/s |
| Buffer Size | 128 MB |
| Logical Blocks | 3,907,050,336 |
| Seek Time | 12 ms (Average) |
| Height | 0.374 in/9.5 mm (nominal) |
| Width (nominal) | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

500 GB 7200RPM 2.5in Self Encrypted OPAL2 SATA HDD

| | |
|------------------------------|---|
| Capacity | 500 GB |
| Architecture | Self-Encrypting (SED) Solid State Drive with SATA interface |
| Interface | SATA 6 Gb/s |
| Buffer Size | 32 MB |
| Logical Blocks | 976,773,168 |
| Seek Time | 12 ms (Average) |
| Height | 0.267 in/6.8 mm (nominal) |
| Width | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

500 GB 7200RPM 2.5in Self Encrypted Federal Information Processing Standard SATA HDD

| | |
|------------------------------|---|
| Capacity | 500 GB |
| Architecture | Self-Encrypting (SED) Solid State Drive with SATA interface |
| Interface | SATA 6 Gb/s |
| Buffer Size | 32 MB |
| Logical Blocks | 976,773,168 |
| Seek Time | 12 ms (Average) |
| Height | 0.267 in/6.8 mm (nominal) |
| Width | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

500 GB 5400RPM 2.5in SATA SSHD

| | |
|------------------------------|--|
| Capacity | 500 GB |
| Rotational Speed | 5,400 rpm |
| Drive Type | Solid State Hybrid Drive (SSHD) technology with NAND Flash |
| Interface | SATA 6 Gb/s |
| Buffer Size | 64 MB |
| NAND Flash | 8 GB |
| Seek Time | 12 ms (Average) |
| Height | 0.267 in/6.8 mm (nominal) |
| Width | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

1 TB 5400RPM 2.5in SATA SSHD

| | |
|------------------------------|--|
| Capacity | 1 TB |
| Rotational Speed | 5,400 rpm |
| Drive Type | Solid State Hybrid Drive (SSHD) technology with NAND Flash |
| Interface | SATA 6 Gb/s |
| Buffer Size | 64 MB |
| NAND Flash | 8 GB |
| Seek Time | 12 ms (Average) |
| Height | 0.374 in/9.5 mm (nominal) |
| Width | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

2 TB 5400RPM 2.5in SATA SSHD

| | |
|------------------------------|--|
| Capacity | 2 TB |
| Rotational Speed | 5,400 rpm |
| Drive Type | Solid State Hybrid Drive (SSHD) technology with NAND Flash |
| Interface | SATA 6 Gb/s |
| Buffer Size | 128 MB |
| NAND Flash | 8 GB |
| Seek Time | 12 ms (Average) |
| Height | 0.374 in/9.5 mm (nominal) |
| Width | 2.75 in/70 mm (nominal) |
| Operating Temperature | 41° to 131° F (5° to 55° C) |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

128 GB 2.5in SATA Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | <50g |
| Capacity | 128 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 70K/40K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 380MB/s |
| Logical Blocks | 250,069,680 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

256 GB 2.5in SATA Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | <62g |
| Capacity | 256 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 55K/68K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 450MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

512 GB 2.5in SATA Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | <50g |
| Capacity | 512 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 92K/83K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 500MB/s |
| Logical Blocks | 1,000,215,216 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

256 GB 2.5in SATA Self Encrypted OPAL2 Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | <50g |
| Capacity | 256 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 55K/80K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 500MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM; TCG-OPAL2.0 security |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

512 GB 2.5in SATA Self Encrypted OPAL2 Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | <50g |
| Capacity | 512 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 92K/83K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 500MB/s |
| Logical Blocks | 1,000,215,216 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM; TCG-OPAL2.0 security |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

256 GB 2.5in SATA Self Encrypted Federal Information Processing Standard SSD

| | |
|---------------------------------|--|
| Drive Weight | <40g |
| Capacity | 256 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 55K/83K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 500MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM; FIPS 140-2 security |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

512 GB 2.5in SATA Self Encrypted Federal Information Processing Standard SSD

| | |
|---------------------------------|--|
| Drive Weight | <45g |
| Capacity | 512 GB |
| Height | 7mm |
| Length | 100.45mm |
| Width | 69.85mm |
| Interface | SATA 3.0 (6Gb/s) |
| Performance | Up to Random Read/Write = 92K/83K IOPS |
| Maximum Sequential Read | Up to 530MB/s |
| Maximum Sequential Write | Up to 500MB/s |
| Logical Blocks | 1,000,215,216 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM; FIPS 140-2 security |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

128 GB M.2 2280 PCIe NVMe SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 128GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3 |
| Performance | Up to Random Read/Write = 60K/50K IOPS |
| Maximum Sequential Read | Up to 1400MB/s |
| Maximum Sequential Write | Up to 395MB/s |
| Logical Blocks | 250,069,680 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

256 GB M.2 2280 PCIe NVMe SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 256 GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3 |
| Performance | Up to Random Read/Write = 120K/170K IOPS |
| Maximum Sequential Read | Up to 1600MB/s |
| Maximum Sequential Write | Up to 780MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

512 GB M.2 2280 PCIe NVMe SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 512 GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3 |
| Performance | Up to Random Read/Write = 200K/180K IOPS |
| Maximum Sequential Read | Up to 1600MB/s |
| Maximum Sequential Write | Up to 860MB/s |
| Logical Blocks | 1,000,215,216 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

128 GB M.2 2280 PCIe NVMe Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 128 GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3x4 |
| Performance | Up to Random Read/Write = 140K/40K IOPS |
| Maximum Sequential Read | Up to 2800MB/s |
| Maximum Sequential Write | Up to 600MB/s |
| Logical Blocks | 250,069,680 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

256 GB M.2 2280 PCIe NVMe Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 256GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3x4 |
| Performance | Up to Random Read/Write = 150K/180K IOPS |
| Maximum Sequential Read | Up to 2700MB/s |
| Maximum Sequential Write | Up to 1000MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

512 GB M.2 2280 PCIe NVMe Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 512 GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3x4 |
| Performance | Up to Random Read/Write = 270K/235K IOPS |
| Maximum Sequential Read | Up to 2900MB/s |
| Maximum Sequential Write | Up to 1100MB/s |
| Logical Blocks | 1,000,215,216 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

1 TB M.2 2280 PCIe NVMe Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 1 TB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3x4 |
| Performance | Up to Random Read/Write = 290K/240K IOPS |
| Maximum Sequential Read | Up to 2900MB/s |
| Maximum Sequential Write | Up to 2100MB/s |
| Logical Blocks | 2,000,409,264 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Storage

256 GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 256 GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3x4 |
| Performance | Up to Random Read/Write = 150K/180K IOPS |
| Maximum Sequential Read | Up to 2700MB/s |
| Maximum Sequential Write | Up to 1000MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2; TCG-OPAL2 security |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

512 GB M.2 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer Cell SSD

| | |
|---------------------------------|--|
| Drive Weight | < 10g |
| Capacity | 512 GB |
| Height | 2.38mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIe Gen3x4 |
| Performance | Up to Random Read/Write = 270K/235K IOPS |
| Maximum Sequential Read | Up to 2900MB/s |
| Maximum Sequential Write | Up to 1100MB/s |
| Logical Blocks | 1,000,215,216 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2; TCG-OPAL2 security |

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications – Networking

NETWORKING AND COMMUNICATIONS

Intel® i219LM 10/100/1000 Integrated NIC

| | |
|-------------------------------------|--|
| Connector | RJ-45 |
| System Interface | PCI (Intel® proprietary) + SMBus |
| Data rates supported | 10 Mbit/s operation (10BASE-T; IEEE 802.3j; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s |
| IEEE Compliance | IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet) |
| Performance | TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling Jumbo Frame 9K |
| Power consumption | Cable Disconnection: 25mW 100Mbps Full Run: 450mW 1000bp Full Run: 1000mW WoL Enable(S3/S4/S5): 50mW WoL Disable(S3/S4/S5): 25mW |
| Power Management | ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption |
| Management Interface | Auto MDI/MDIX Crossover cable detection |
| IT Manageability | Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status |
| Security & Manageability | Intel® vPro™ support with appropriate Intel® chipset components |

Technical Specifications – Networking

| Intel® 9560 802.11AC 2x2 with Bluetooth® M.2 Combo Card vPro™ | |
|--|--|
| Wireless LAN Standards | IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac |
| Interoperability | Wi-Fi certified |
| Frequency Band | 802.11b/g/n • 2.402 – 2.482 GHz 802.11a/n • 4.9 – 4.95 GHz (Japan) • 5.15 – 5.25 GHz • 5.25 – 5.35 GHz • 5.47 – 5.725 GHz • 5.825 – 5.850 GHz |
| Data Rates | • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz) |
| Modulation | Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM |
| Security¹ | • 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 |
| Network Architecture Models | Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) |
| Roaming | IEEE 802.11 compliant roaming between access points |
| Output Power² | • 802.11b: +18.5dBm minimum • 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum • 802.11ac VHT160(5GHz): +11.5dBm minimum |
| Power Consumption | • Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW |
| Power Management | ACPI and PCI Express compliant power management 802.11 compliant power saving mode |
| Receiver Sensitivity³ | 802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum |

Technical Specifications – Networking

| | | |
|---|---|--------------------------------|
| | 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum | |
| Antenna type | High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications | |
| Form Factor | PCI-Express M.2 MiniCard | |
| Dimensions | Type 2230: 2.3 x 22.0 x 30.0 mm | |
| Weight | Type 2230: 2.8g | |
| 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 | |
| | <ol style="list-style-type: none"> 1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation). | |
| HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0 Wireless Technology | | |
| Bluetooth® Specification | 4.0/4.1/4.2/5.0 Compliant | |
| Frequency Band | 2402 to 2480 MHz | |
| Number of Available Channels | Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH) | |
| Data Rates and Throughput | Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels | |
| Transmit Power | The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR. | |
| Power Consumption | Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW | |
| Range | Legacy Up to 33 ft (10 m) BLE Up to 99 ft (30 m) | |
| Bluetooth® Software Supported Link Topology | Microsoft Windows Bluetooth® Software | |
| Power Management | Microsoft Windows ACPI, and USB Bus Support | |
| Certifications | FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark | |
| Bluetooth Profiles Supported | BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full | |

Technical Specifications – Networking

| | |
|-------------------------------------|--|
| | <p>LE Privacy 1.2 –Link Layer Privacy</p> <p>LE Privacy 1.2 –Extended Scanner Filter Policies</p> <p>LE Data Packet Length Extension</p> <p>FAX Profile (FAX)</p> <p>Basic Imaging Profile (BIP)2</p> <p>Headset Profile (HSP)</p> <p>Hands Free Profile (HFP)</p> <p>Advanced Audio Distribution Profile (A2DP)</p> |
| Security & Manageability | Intel® vPro™ support with appropriate Intel® chipset components |

| | |
|--|---|
| Intel® 9560 802.11AC 2x2 with Bluetooth® M.2 Combo Card non-vPro™ | |
| Wireless LAN Standards | <p>IEEE 802.11a</p> <p>IEEE 802.11b</p> <p>IEEE 802.11g</p> <p>IEEE 802.11n</p> <p>IEEE 802.11ac</p> |
| Interoperability | Wi-Fi certified |
| Frequency Band | <p>802.11b/g/n</p> <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>802.11a/n</p> <ul style="list-style-type: none"> • 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 |
| Data Rates | <ul style="list-style-type: none"> • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz) |
| Modulation | <p>Direct Sequence Spread Spectrum</p> <p>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM</p> |
| Security¹ | <ul style="list-style-type: none"> • 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 |
| Network Architecture Models | <p>Ad-hoc (Peer to Peer)</p> <p>Infrastructure (Access Point Required)</p> |
| Roaming | IEEE 802.11 compliant roaming between access points |
| Output Power² | <ul style="list-style-type: none"> • 802.11b : +18.5dBm minimum • 802.11g : +17.5dBm minimum • 802.11a : +18.5dBm minimum • 802.11n HT20(2.4GHz) : +15.5dBm minimum • 802.11n HT40(2.4GHz) : +14.5dBm minimum • 802.11n HT20(5GHz) : +15.5dBm minimum • 802.11n HT40(5GHz) : +14.5dBm minimum • 802.11ac VHT80(5GHz) : +11.5dBm minimum • 802.11ac VHT160(5GHz) : +11.5dBm minimum |
| Power Consumption | <ul style="list-style-type: none"> • Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) |

Technical Specifications – Networking

| | | | | | |
|---|---|---|---|---|--------------------------------|
| | <ul style="list-style-type: none"> • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW | | | | |
| Power Management | ACPI and PCI Express compliant power management 802.11 compliant power saving mode | | | | |
| Receiver Sensitivity³ | 802.11b, 1Mbps : -93.5dBm maximum 802.11b, 11Mbps : -84dBm maximum 802.11a/g, 6Mbps : -86dBm maximum 802.11a/g, 54Mbps : -72dBm maximum 802.11n, MCS07 : -67dBm maximum 802.11n, MCS15 : -64dBm maximum 802.11ac, MCS0 : -84dBm maximum 802.11ac, MCS9 : -59dBm maximum | | | | |
| Antenna type | High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications | | | | |
| Form Factor | PCI-Express M.2 MiniCard | | | | |
| Dimensions | Type 2230: 2.3 x 22.0 x 30.0 mm | | | | |
| Weight | Type 2230: 2.8g | | | | |
| Operating Voltage | 3.3v +/- 9% | | | | |
| Temperature | <table border="1"> <tr> <td>Operating</td> <td>14° to 158° F (-10° to 70° C)</td> </tr> <tr> <td>Non-operating</td> <td>-40° to 176° F (-40° to 80° C)</td> </tr> </table> | Operating | 14° to 158° F (-10° to 70° C) | Non-operating | -40° to 176° F (-40° to 80° C) |
| Operating | 14° to 158° F (-10° to 70° C) | | | | |
| Non-operating | -40° to 176° F (-40° to 80° C) | | | | |
| Humidity | <table border="1"> <tr> <td>Operating</td> <td>10% to 90% (non-condensing)</td> </tr> <tr> <td>Non-operating</td> <td>5% to 95% (non-condensing)</td> </tr> </table> | Operating | 10% to 90% (non-condensing) | Non-operating | 5% to 95% (non-condensing) |
| Operating | 10% to 90% (non-condensing) | | | | |
| Non-operating | 5% to 95% (non-condensing) | | | | |
| Altitude | <table border="1"> <tr> <td>Operating</td> <td>0 to 10,000 ft (3,048 m)</td> </tr> <tr> <td>Non-operating</td> <td>0 to 50,000 ft (15,240 m)</td> </tr> </table> | Operating | 0 to 10,000 ft (3,048 m) | Non-operating | 0 to 50,000 ft (15,240 m) |
| 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 | | | | |
| | <ol style="list-style-type: none"> 1. Check latest software/driver release for updates on supported security features. 2. Maximum output power may vary by country according to local regulations. 3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation). | | | | |
| HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.0 Wireless Technology | | | | | |
| Bluetooth® Specification | 4.0/4.1/4.2/5.0 Compliant | | | | |
| Frequency Band | 2402 to 2480 MHz | | | | |
| Number of Available Channels | Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH) | | | | |
| Data Rates and Throughput | <table border="1"> <tr> <td>Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps</td> </tr> <tr> <td>BLE : 1 Mbps data rate; throughput up to 0.2 Mbps</td> </tr> <tr> <td>Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels</td> </tr> </table> | Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps | BLE : 1 Mbps data rate; throughput up to 0.2 Mbps | Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels | |
| Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps | | | | | |
| BLE : 1 Mbps data rate; throughput up to 0.2 Mbps | | | | | |
| Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels | | | | | |
| Transmit Power | The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +4 dBm for BR and EDR. | | | | |
| Power Consumption | Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW | | | | |
| Range | Legacy Up to 33 ft (10 m) BLE Up to 99 ft (30 m) | | | | |
| Bluetooth® Software Supported Link Topology | Microsoft Windows Bluetooth® Software | | | | |
| Power Management | Microsoft Windows ACPI, and USB Bus Support | | | | |
| Certifications | FCC (47 CFR) Part 15C, Section 15.247 & 15.249 | | | | |

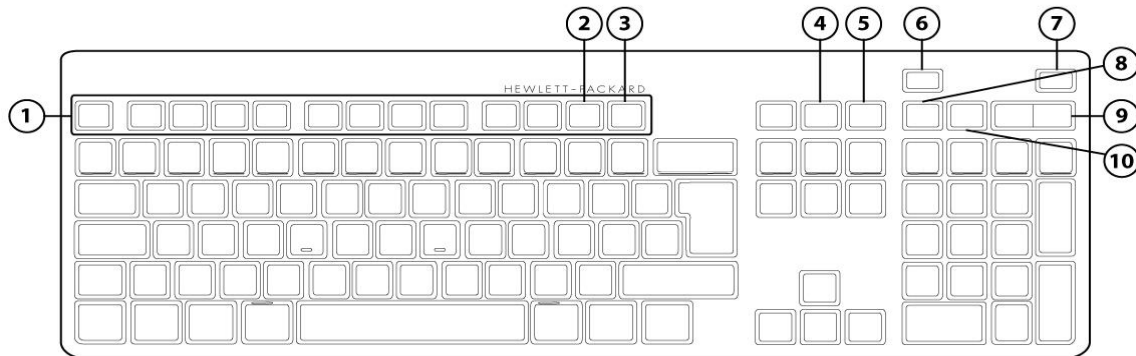
Technical Specifications – Networking

| | |
|-------------------------------------|---|
| | <p>ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark</p> |
| Bluetooth Profiles Supported | <p>BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 –Link Layer Privacy LE Privacy 1.2 –Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)</p> |

Technical Specifications – I/O Devices

I/O DEVICES

HP USB Premium Keyboard



- | | |
|---|-----------------------|
| 1. Function Keys | 6. End/Decline a Call |
| 2. F11 Lync or Skype for Business Contact list ¹ | 7. Answer a Call |
| 3. F12 Lync or Skype for Business Calendar ² | 8. Microphone Mute |
| 4. Share Screen | 9. Volume Up/Down |
| 5. Stop Webcam | 10. Audio Mute |

1. Microsoft Lync 2013, or Skype for Business, or Microsoft Outlook 2013 Contact list
 2. Microsoft Lync 2013, or Skype for Business, or Microsoft Outlook 2013 Calendar

HP USB Premium Keyboard

| | | |
|---------------------------------|-------------------------|--|
| Physical Characteristics | Keys | 104, 105 layout (depending upon country) |
| | Dimensions (L x W x H) | 17.04 x 5.55 x 0.52 in (433 x 141 x 13.2 mm) |
| | Weight | 1.54 lb. (698g) |
| Electrical | Operating voltage | 5 VDC, +/-5% |
| | Power consumption | 35mA (All LED on) |
| | System interface | USB Type A plug connector |
| | ESD | Contact Discharge: 8 KV Air Discharge: 15 KV |
| | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft® PC 99 - 2001 | Functionally compliant |
| Mechanical | Keycaps | Low-profile design |
| | Switch actuation | 60±10g nominal peak force with tactile feedback |
| | Switch life | 10 million keystrokes (Life 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) |

Technical Specifications – I/O Devices

| | | |
|-----------------------------|--|---|
| | Microsoft PC 99 - 2001 | Mechanically compliant |
| Environmental | Acoustics | 43-dBA maximum sound pressure level |
| | Operating temperature | 50° to 122° F (10° to 50° C) |
| | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | Operating shock | 40 g, six surfaces |
| | Non-operating shock | 80 g, six surfaces |
| | Operating vibration | 2-g peak acceleration |
| | Non-operating vibration | 4-g peak acceleration |
| | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | Drop (in box) | 30 in (76.2 cm) on concrete, 16-drop sequence |
| Approvals | UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC | |
| Ergonomic compliance | TUVGS | |
| Kit contents | Keyboard, QSP | |
| Warranty Card | Product Notice | |

Technical Specifications – I/O Devices

| Skylab USB Wired Keyboard | | |
|----------------------------------|---|---|
| Physical Characteristics | Keys | 104, 105, 106, 107, 109 layout (depending upon country) |
| | Dimensions (L x W x H) | 171.97 x 68.35 x 8.27 in (436.8± 1.5 x 137.6± 1.0 x 21.0± 1.0 cm) |
| | Weight | 1.32 lb. (0.6± 0.08 kg) |
| Electrical | Operating voltage | 4.4-5.25VDC |
| | Power consumption | 50-mA maximum (with 5 VDC power supplied and three LEDs ON) |
| | System interface | USB |
| | ESD | Contact Discharge: 2, 4,6,8KV Air Discharge: 2, 4, 8,10,12.5KV |
| | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| Mechanical | Keycaps | Low-profile design |
| | Switch actuation | 60±10g nominal peak force with tactile feedback |
| | Switch life | 10 million keystrokes (Life 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 |
| Environmental | Acoustics | 43-dBA maximum sound pressure level |
| | Operating temperature | 50° to 122° F (10° to 50° C) |
| | Non-operating temperature | Minus 30 degrees to 60 degrees Celsius |
| | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | Operating shock | 40 g, six surfaces |
| | Non-operating shock | 80 g, six surfaces |
| | Operating vibration | 2-g peak acceleration |
| | Non-operating vibration | 4-g peak acceleration |
| | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | Drop (in box) | 30 in (76.2 cm) on concrete, 16-drop sequence |
| Approvals | UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC | |
| Ergonomic compliance | ANSI HFS 100, ISO 9241-4, and TUVGS | |
| Kit contents | Keyboard, Installation Guide, Warranty card, Safety and Comfort Guide | |

Technical Specifications – I/O Devices

| HP USB Premium Mouse | | |
|-------------------------------|--|--|
| Dimensions (H x L x W) | 4.21 x 2.64 x 1.52 in (107 x 67 x 38.7 mm) | |
| Weight | 0.19lb (90g) | |
| 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 | 50 g, 6 surfaces |
| | Non-operating shock | 80 g, 6 surfaces |
| | Operating vibration | 2 g peak acceleration |
| | Non-operating vibration | 4 g peak acceleration |
| Electrical | Operating voltage | 5 VDC, +/-5% |
| | Power consumption | 12mA |
| Mechanical | Connector | USB 2.0 |
| | Type | 3D mouse (3 keys and wheel) |
| | Resolution | 800, 1200, 1600 DPI |
| | Sensor | Pixart PAN3606DL |
| Tracking speed | Tracking acceleration | 8G(max), 1G=9.8m/s ² |
| | Cable length | 6 ft. (1.8 m) |
| | Color | Jack Black |
| Regulatory approvals | Compliant | UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC |

| HP USB Mouse | | |
|-------------------------------|-------------------|--|
| Dimensions (H x L x W) | 37mm*115mm*62.9mm | |
| Weight | 90 +10g/- 5 g | |
| Color | Black | |
| Connector | USB | |
| Mechanical | Resolution | 800 DPI sensitivity |
| | Buttons | Two primary buttons and clickable scroll wheel |

Technical Specifications – Audio

HIGH DEFINITION AUDIO

| | |
|-----------------------------------|--|
| Type | Integrated |
| HD Audio Codec | Conexant CX20632 |
| | Front: 1 - Headset connector supports a CTIA style headset and is re-taskable as a Line-in, Line-out, Microphone-in or Headphone-out port 1 - Headphone port |
| Audio I/O Ports | All ports are 3.5mm and support stereo |
| Internal Speaker Amplifier | 2W class D mono amplifier for the internal speaker only. External speakers must be powered |
| Multi-streaming Capable | Playback multi-streaming can be enabled in the audio control panel to allow independent audio streams to be sent to/from the front and rear jacks or integrated speaker. |
| Sampling | Independent sampling rates for DAC's and ADC's; supports resolutions from 16 to 24-bit; 44.1 kHz to 192 kHz for DAC and 44.1 kHz to 96 kHz for ADC |
| Wavetable Syntheses | Yes - Uses OS soft wavetable |
| Analog Audio | Yes |
| # of Channels on Line-Out | Stereo (Left & Right channels) |
| Internal Speaker | Yes |

Technical Specifications – Power Supply

POWER SUPPLY

Unit Environment and Operating Conditions

| | |
|---|--|
| Temperature Range | Operating: 5°C ~35°C Non-Operating: -40°C ~66°C |
| Relative Humidity | Operating 5% to 90% relative humidity at max inlet temperature Non-Operating 5% to 90% relative humidity at max inlet temperature |
| Maximum Altitude (unpressurized) | Operating: 5000m Non-operating: 50,000 ft. (15240 m) |

| | |
|-------------------------|---|
| 80 PLUS Platinum | 65W EPS, 89% average efficiency at 115V & 230Vac 90W EPS, 89% average efficiency at 115V & 230Vac 150W EPS, 89% average efficiency at 115V & 230Vac |
|-------------------------|---|

| | |
|---------------------------------|--------------------------------------|
| Operating Voltage Range | 90Vac~264Vac |
| Rated Voltage Range | 100Vac~240Vac |
| Rated Line Frequency | 50HZ~60HZ |
| Operating Line Frequency | 47HZ~63HZ |
| Rated Input Current | 65W ≤1.6A 90W ≤1.2A 150W ≤2.2A |

| | |
|--|--------------------------------------|
| Rated Input Current with Energy Efficient* Power Supply | 65W ≤1.6A 90W ≤1.2A 150W ≤2.2A |
|--|--------------------------------------|

| | |
|------------------|---------|
| DC Output | +19.5VV |
|------------------|---------|

| | |
|--|---|
| Current Leakage (NFPA 99: 2102) | Less than 500 microamps of leakage current at 120 Vac with the ground wire disconnected, as required for Non-patient Electrical Appliances and Equipment used in a patient care facility or that contact patients in normal use. Per section 10.3.5.1. Less than 100 microamps of leakage current at 120 Vac with the ground wire intact with normal polarity, as required for Non-patient Electrical Appliances and Equipment used in a patient care facility or that contact patients in normal use. Per section 10.3.5.1. |
|--|---|

| | |
|-------------------------------|---|
| Power cord length | 6.0 ft. (1.83 m) |
| External Power Adapter | External power supply |
| Dimensions | 65W: 113.5mm x 55mm x 30mm 90W: 132mm x 57mm x 30mm 150W: 160mm x 80mm x 40mm |
| Total Cord Length | 6.0 ft. (1.83 m) |

Technical Specifications – Weights & Dimensions

WEIGHTS & DIMENSIONS

| | |
|------------------------------|--|
| Chassis (W x D x H) | 177x175x34mm |
| System Volume | 1.05L |
| System Weight | 1.05 kg 2.31 lb |
| Stand Dimensions | 160x117x18.5mm |
| Packaging (W x D x H) | 497 x128 x223mm |
| Shipping Weight | 2.95 kg 6.49 lb |
| Palletization Profile | 18-units per layer 5 or 6 layers max depending on details of air freight 90 or 108 units per pallet depending on details of air freight 45.354 x 39.13 x 75.551 in, 1152 x 994 x 1919 mm (include pallet) |

MISCELLANEOUS FEATURES

Management Features

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

Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
 - Power LED will blink red 2 to 5 times, then blink white 2 or more times, then repeat (with beep tones for each blink initially):
 - 2 red + 2 white User must provide file for BIOS recovery (USB storage typically)
 - 2 red + 3 white User must enter a key sequence to proceed with recovery by policy
 - 2 red + 4 white BIOS recovery is in progress
 - 3 red + 2 white Memory could not be initialized
 - 3 red + 3 white Graphics adaptor could not be found
 - 3 red + 4 white Power supply failure / not connected
 - 3 red + 5 white Processor not installed
 - 3 red + 6 white Current processor does not support an enabled feature
 - 4 red + 2 white Processor has exceeded its temperature threshold / system thermal shutdown
 - 4 red + 3 white System internal temperature has exceeded its threshold
 - 5 red + 2 white System controller firmware is not valid
 - 5 red + 3 white System controller detected BIOS is not executing
 - 5 red + 4 white BIOS could not complete initialization / PCA failure
 - 5 red + 5 white System controller rebooted the system after a health or recovery timer triggered
- HP PC Hardware Diagnostics UEFI:

Technical Specifications – Weights & Dimensions

- This utility enables hardware level testing outside the operating system on many components. The diagnostics can be invoked by pressing F2 at POST, and is available as a download from HP Support
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software⁵ Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal (For MT, SFF, and DM only)
- Green Pull Tabs, and Quick Release Latches for easy Identification

Additional Features

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

Technical Specifications – Environmental & Industry

ENVIRONMENTAL & INDUSTRY

Eco-Label Certifications & declarations

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

- IT ECO declaration
- US ENERGY STAR®
- EPEAT® Gold registered in the United States. See <http://www.epeat.net> for registration status in your country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>.

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Desktop model is based on a "Typically Configured Desktop."

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

| | 115VAC, 60Hz | 230VAC, 50Hz | 100VAC, 60Hz |
|-------------------------------|--------------|--------------|--------------|
| Normal Operation (Short idle) | 13.599 | 13.514 | 13.099 |
| Normal Operation (Long idle) | 12.211 | 11.765 | 12.367 |
| Sleep | 1.318 | 1.312 | 1.322 |
| Off | 0.616 | 0.618 | 0.618 |

NOTE: Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*

| | 115VAC, 60Hz | 230VAC, 50Hz | 100VAC, 60Hz |
|-------------------------------|--------------|--------------|--------------|
| Normal Operation (Short idle) | 46.3726 | 46.0827 | 44.6676 |
| Normal Operation (Long idle) | 41.6395 | 40.1187 | 42.1715 |
| Sleep | 4.4944 | 4.4739 | 4.508 |
| Off | 2.1006 | 2.1074 | 2.1074 |

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

Declared Noise Emissions

(in accordance with ISO 7779 and ISO 9296)

| | Sound Power (L _{WAd} , bels) | Sound Pressure (L _{pAm} , decibels) |
|-----------------------------|---------------------------------------|--|
| Typically Configured – Idle | 3.1 | 20 |
| Fixed Disk – Random writes | 4.4 | 33 |

Longevity and Upgrading

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

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

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 1ppm by weight

Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)

Technical Specifications – Environmental & Industry

Battery type: Lithium

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/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 in the U.S. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 0% post-consumer recycled plastic (by wt.)
- This product is 95.1% recycle-able when properly disposed of at end of life.

Packaging Materials

External: PAPER/Corrugated

Internal: PLASTIC/EPS (Expanded Polyethylene)
PLASTIC/Polyethylene low density

The Plastic packaging material is made from 10.5% recycled content.

The corrugated paper packaging materials contains at least 43.8% recycled content.

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/pdf/gse.pdf>):

- 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
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- 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)

Technical Specifications – Environmental & Industry

Packaging Usage

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

HP Inc. 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.

HP, Inc. Corporate Environmental Information

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

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

Eco-label certifications

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

ISO 14001 certifications:

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842>

and

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

Technical Specifications – After Market Options

AFTER MARKET OPTIONS

| Graphics Solutions | Part Number |
|--|--------------------|
| HP DisplayPort To HDMI True 4k Adapter | 2JA63AA |
| HP DVI Cable Kit | DC198A |
| HP HDMI Standard Cable Kit | T6F94AA |
| HP DisplayPort Cable Kit | VN567AA |
| HP DisplayPort To VGA Adapter | AS615AA |
| HP DisplayPort To DVI-D Adapter | FH973AA |

| Desktop Mini Accessories | Part Number |
|---|--------------------|
| HP Desktop Mini G4 Port Cover Kit | 1ZE52AA |
| HP G4 Mini 2.5-inch SATA Drive Bay Kit | 3TK91AA |
| HP Desktop Mini LockBox V2 | 3EJ57AA |
| HP Desktop Mini 500GB HDD/I/O Expansion Module | K9Q82AA |
| HP Desktop Mini DVD-Writer ODD Expansion Module | K9Q83AA |
| HP Desktop Mini I/O Expansion Module | K9Q84AA |
| HP Desktop Mini Security/Dual VESA Sleeve v2 | 2JA32AA |
| HP Desktop Mini Vertical Chassis Stand | G1K23AA |
| HP DM VESA Power Supply Holder Kit | 1RL87AA |

| Data Storage Drives | Part Number |
|---|--------------------|
| HP 256GB SATA TLC Non-SED Solid State Drive | P1N68AA |
| HP PCIe NVME TLC 256GB SSD M.2 Drive | 1CA51AA |
| HP PCIe NVME TLC 512GB SSD M.2 Drive | X8U75AA |

| Input Devices | Part Number |
|--|--------------------|
| HP USB Business Slim CCID SmartCard Keyboard | Z9H48AA |
| HP USB Business Slim (Grey) Keyboard (EMEA Only) | Z9H49AA |
| HP USB Business Slim Keyboard | N3R87AA |
| HP USB Collaboration Keyboard | Z9N38AA |
| HP USB Keyboard | QY776AA |
| HP USB Keyboard and Mouse Healthcare Edition | 1VD81AA |
| HP USB Premium Keyboard | Z9N40AA |
| HP USB PS/2 Washable Keyboard & Mouse | BU207AA |
| HP Wireless Business Slim Keyboard and Mouse | N3R88AA |
| HP Wireless Collaboration Keyboard | Z9N39AA |
| HP USB Grey v2 Mouse (EMEA only) | Z9H74AA |
| HP USB Premium Mouse | 1JR32AA |
| HP USB 1000dpi Laser Mouse | QY778AA |

Technical Specifications – After Market Options

| | |
|-----------------------|---------|
| HP USB Hardened Mouse | P1N77AA |
| HP USB Mouse | QY777AA |

| System Memory | Part Number |
|--------------------------|--------------------|
| HP 4GB DDR4-2666 SODIMM | 3TK86AA |
| HP 8GB DDR4-2666 SODIMM | 3TK88AA |
| HP 16GB DDR4-2666 SODIMM | 3TK84AA |

| Multimedia Devices | Part Number |
|-----------------------------|--------------------|
| HP Business Headset v2 | T4E61AA |
| HP USB Business Speakers v2 | N3R89AA |

| Security Devices | Part Number |
|--------------------------|--------------------|
| HP Keyed Cable Lock 10mm | T1A62AA |

| Stands and Accessories | Part Number |
|-------------------------------|--------------------|
| HP B300 PC Mounting Bracket | 2DW53AA |
| HP B500 PC Mounting Bracket | 2DW52AA |
| HP Single Monitor Arm | BT861AA |

| I/O Devices | Part Number |
|--|--------------------|
| HP DisplayPort Port Flex IO | 3TK72AA |
| HP Fiber NIC Port Flex IO | 3TK73AA |
| HP HDMI Port Flex IO (400/600/800) | 3TK74AA |
| HP Thunderbolt 3.0 Port Flex IO | 3TK77AA |
| HP Type-C™ USB 3.1 Gen2 Port Flex IO | 3TK78AA |
| HP Type-C™ USB 3.1 Gen2 Port with PD Flex IO | 3TK79AA |
| HP VGA Port Flex IO | 3TK80AA |
| HP Serial Port Flex IO | 3TK76AA |

| Intel® Optane Memory | Part Number |
|-----------------------------------|--------------------|
| Intel® Optane Memory 16GB (Cache) | 1WV97AA |

© Copyright 2018 HP Development Company, L.P.

The information contained herein is subject to change without notice. The only warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. Intel, Celeron®, Core, Pentium are registered trademarks or trademarks of Intel Corporation in the U.S. and/or other countries. Bluetooth is a trademark of its proprietor, used by HP Inc. under license. NVIDIA, GeForce, Kepler and NVS are trademarks and/or registered trademarks of NVIDIA Corporation in the U.S. and other countries. AMD and Radeon are trademarks of Advanced Micro Devices, Inc. ENERGY STAR is a registered trademark owned by the U.S. Environmental Protection Agency.

DisplayPort™ and the DisplayPort™ logo are trademarks owned by the Video Electronics Standards Association (VESA®) in the United States and other countries.

Change Log

| Date of change: | Version History: | | Description of change: |
|-----------------|------------------|--------|------------------------|
| June 27, 2018 | From v1 to v2 | Update | Processors |