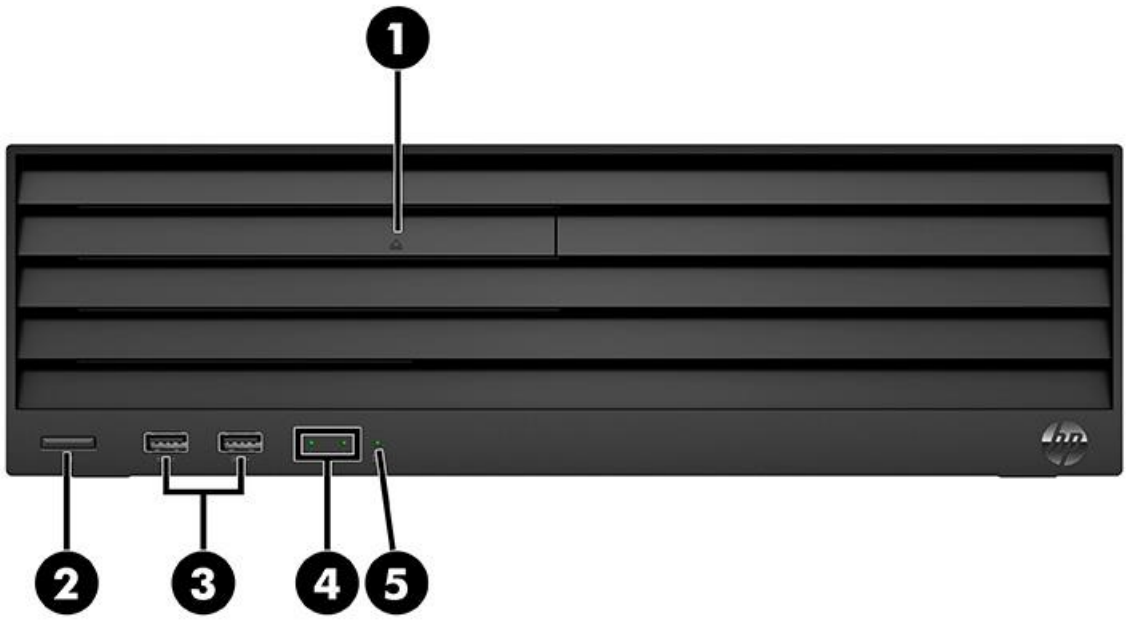
Overview

HP Engage Flex Pro G2 Retail System

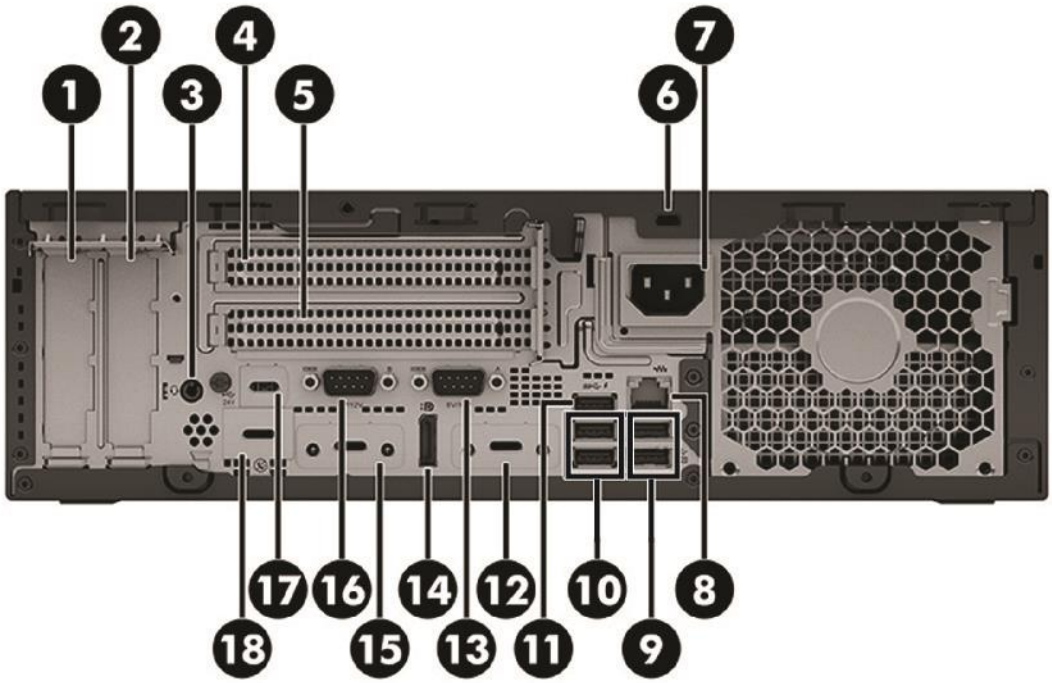


Front View

1. Optical drive with eject button (optional)
2. Power button *
3. 2 USB 3.2 Gen 1 Type-A ports
4. NIC Link indicator LED
5. Hard Drive LED

*The light on the power button is normally white when the power is on. If the light blinks red, the computer displays a diagnostic code to indicate a problem. See the Maintenance and Service Guide to interpret the code.

Overview



Rear View

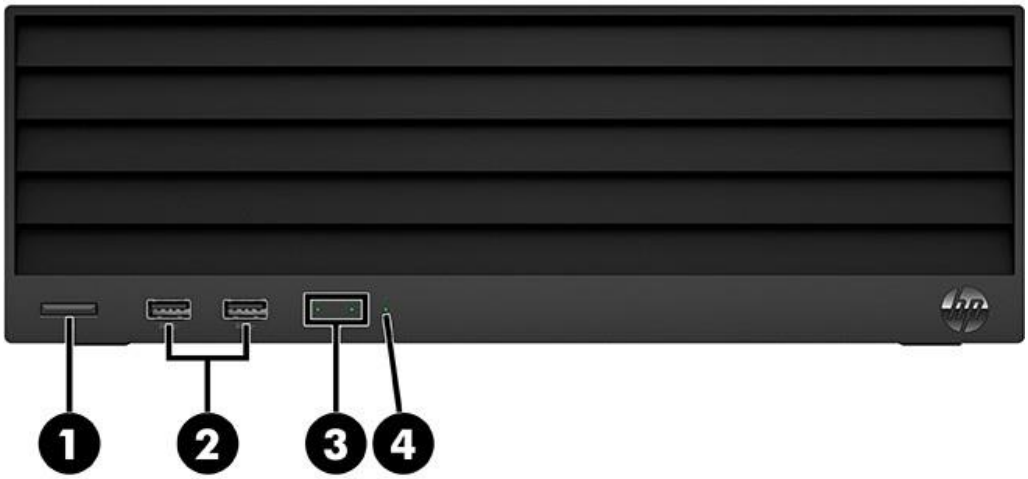
1. PCIe x16 expansion slot **
2. PCIe x4 expansion slot **
3. Audio-out (headphone)/Audio-in (microphone) combo jack
4. PCIe x1 expansion slots (optional)*
5. PCIe x1 expansion slots (optional)*
6. Security cable slot
7. Power connector
8. RJ-45 (network) jack
9. USB 2.0 ports
10. USB 3.2 Gen 1 Type-A ports
11. USB 3.2 Gen 1 Type-A port with HP Sleep and Charge
12. Flex Port
    - USB 3.1 Gen2 Type-C® port (15W)
    - USB Type-C® port (w 65W PD)****
    - 2X USB 3.1 Gen1 Type-A port
    - DisplayPort™ port
    - HDMI port
    - VGA port
    - Intel i225 2.5Gbps Ethernet port
    - Serial Port
    - Fiber NIC 1Gbps*****
13. Serial port (optional)
14. DisplayPort™ monitor Connector
15. Flex port
    - USB 3.1 Gen2 Type-C® port (15W)
    - USB Type-C® port (w 27W PD)****
    - 2X USB 3.1 Gen1 Type-A port
    - DisplayPort™ port
    - HDMI port
    - VGA port
    - Intel i225 2.5Gbps Ethernet port
    - Serial Port
16. Serial port (optional)
17. PUSB Port, 24V (optional)***
18. Cash drawer port (optional)***

* Can be configured either as two (2) PCI x1 or two (2) PCIe x1 Full-Height slots.
**A variety of cards are available to populate slots, dependent on riser choice and connectors utilized. For full details, please contact your HP sales representative for configuration choices.
***24V USB and Cash Drawer Ports must be sold together
**** Configurations including these Flex Ports may limit other options due to power concerns

Overview

***** Fiber NIC 1Gbps cards would not be available in some selected Europe countries and Korea. And Does not support PXE boot

HP Engage Flex Pro-C G2 Retail System

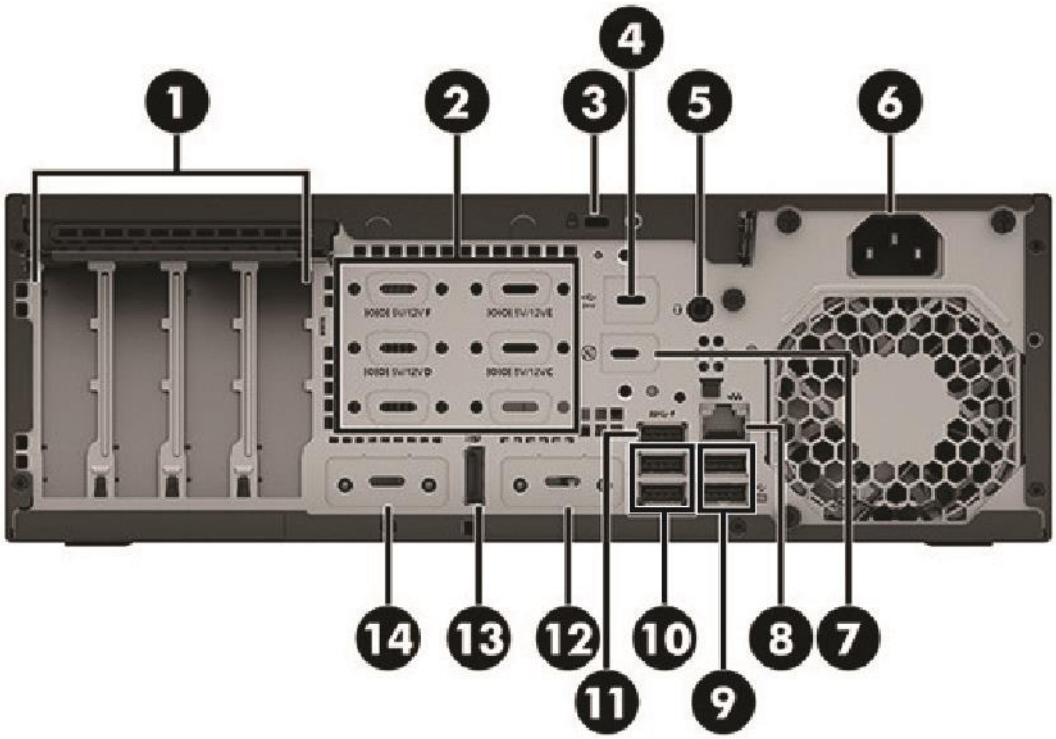


Front View

1. Power button *
2. 2 USB 3.2 Gen 1 Type-A ports
3. NIC Link indicator LED
4. Hard Drive LED

*The light on the power button is normally white when the power is on. If the light blinks red, the computer displays a diagnostic code to indicate a problem. See the Maintenance and Service Guide to interpret the code.

Overview



Rear View

1. PCIe expansion slots (4)**
2. Serial port (optional)
3. Security cable slot
4. PUSB Port, 24V (optional)***
5. Audio-out (headphone)/Audio-in (microphone) combo jack
6. Power connector
7. Cash drawer port (optional)***
8. RJ-45 (network) jack
9. USB 2.0 ports
10. USB 3.2 Gen 1 Type-A ports
11. USB 3.2 Gen 1 Type-A port with HP Sleep and Charge
12. Flex port
    - USB 3.1 Gen2 Type-C® port (15W)
    - USB Type-C® port (w 65W PD)****
    - 2X USB 3.1 Gen1 Type-A port
    - DisplayPort™ port
    - HDMI port
    - VGA port
    - Intel i225 2.5Gbps Ethernet port
    - Serial Port
    - Fiber NIC 1Gbps*****
13. DisplayPort™ monitor Connector
14. Flex port
    - USB 3.1 Gen2 Type-C® port (15W)
    - USB Type-C® port (w 27W PD)****
    - 2X USB 3.1 Gen1 Type-A port
    - DisplayPort™ port
    - HDMI port
    - VGA port
    - Intel i225 2.5Gbps Ethernet port
    - Serial Port

**A variety of cards are available to populate slots, dependent on riser choice and connectors utilized. For full details, please contact your HP sales representative for configuration choices.
***24V USB and Cash Drawer Ports must be sold together
**** Configurations including these Flex Ports may limit other options due to power concerns

Overview

***** Fiber NIC 1Gbps cards would not be available in some selected Europe countries and Korea. And Does not support PXE boot

Overview

Introduction

Efficiently manage your retail business from the store floor to the back office with the HP Engage Flex Pro, our stable, secure, and highest-performing retail platform that delivers maximum flexibility for a range of deployments.

At A Glance

- Choice of two form factors: HP Engage Flex Pro G2, or the smaller HP Engage Flex Pro-C G2
- Intel® Q670E chipset supporting Intel® 13th generation Intel ® Core™ processors, featuring integrated Intel® UHD Graphics and Intel® vPro® Technology (vPro® is optional and requires factory configuration, available with Core i5, Core i7, and Core i9 processors only)[4]
- HP developed and engineered UEFI BIOS supporting security, manageability and software image stability
- Choice of the following pre-installed operating systems:
  - Windows 11 Pro, 64-bit[1]
  - Windows 10 IoT Enterprise LTSC, 64-bit[1]
  - FreeDOS
- Support for 35W and 65W processors
- Integrated 10/100/1000 Ethernet Controller, with optional 802.11ac Wi-Fi and/or Bluetooth® 5.0
- Up to 128GB DDR5 Synchronous Dynamic Random Access Memory (SDRAM)
- Support for up to three video outputs via 1 standard video connector and two optional video port connectors which provide
  the following choices: DisplayPort™ 1.4, HDMI™ 2.0, VGA, or USB Type-C® with Display Output (DisplayPort, HDMI, & USB Type C can support 4k resolution @60 Hz refresh rate)
- Discrete graphics options available
- 90% high efficiency energy saving power supply
- ENERGY STAR ® certified configurations models available (dependent upon the desired configuration)
- Can be configured with multiple hard disk drives in a RAID array
- HP Client Security Manager
  - HP Sure Recover (via Network) Gen5
  - HP Sure Run Gen5
- HP Image Assistant
- HP Manageability Integration Kit
- HP Sure Admin Gen2
- HP Sure Start Gen7
- HP Sure Click
- HP Support Assistant
- ENERGY STAR® certified configurations available. EPEAT® Gold registered configurations available 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
- 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
- Tool-less serviceability features for easier upgrades and repairs
- 40°C ambient thermals standard.
- Tool-less serviceability for easy upgrades and repair
- Optional retail 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.

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

[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.

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

Operating Systems

Preinstalled	Windows 11 Pro, 64-bit*
	Windows 10 IoT Enterprise 2021 LTSC, 64-bit*
	FreeDOS
Certified	SuSE Linux® 15 SP5**

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

* 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 is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com .

**The following features are not supported by SUSE Linux® Enterprise Desktop:

- Power Management features
- Multi-touch capabilities
- Systems configured with Linux® do not qualify for ENERGY STAR®

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

Retail Solutions Services and Features

Intel® Stable Image Platform Program (SIPP)
Intel® vPro® Technology*
HP Global Series Services
Factory Express Deployment and Lifecycle Services
Intel® Standard Manageability
Trusted Platform Module (TPM) v2.0**

*Intel® vPro® Technology available on models with Intel® Core™ i9 to Intel® Core™ i5 processors.
**TPM module disabled where restricted by law, i.e. Russia.

Service and Support

On-site Warranty[15]: One-year (1-1-1) limited warranty delivers one year of on-site, next business day[16] service for parts and labor and includes free support 24 x 7[17]. Configurable options include extension of On Site support to 3, 4, or 5 years. Three, four, or five 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.[18]

15. Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.
16. 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.
17. 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.
18. 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.

Chipset

Intel® Q670E

Processor

Intel® Celeron® Processors

Intel® Celeron® G6900E Processor

46W
3.0 GHz base frequency
4 MB cache, 2 cores, 2 threads
Intel® UHD Graphics 710
Supports DDR5 memory up to 4800 MT/s data rate

Intel® Celeron® G6900TE Processor

35W
2.4 GHz base frequency
4MB cache, 2 cores, 2 threads
Intel® UHD Graphics 710
Supports DDR5 memory up to 4800 MT/s data rate

Intel® Pentium® Processors

Intel® Pentium® Gold G7400 Processor

46W
3.6 GHz base frequency
6 MB cache, 2 cores, 4 threads
Intel® UHD Graphics 710
Supports DDR5 memory up to 4800 MT/s data rate

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

Intel® 13th Generation Core™ i3 Processors

Intel® Core™ i3 13100E Processor[1]
65W
3.3 GHz base frequency
12 MB cache, 4 cores, 8 threads
Intel® UHD Graphics 730
Supports DDR5 memory up to 4800 MT/s data rate

Intel® Core™ i3 13100TE Processor[1]
35W
2.4 GHz base frequency
12 MB cache, 4 cores, 8 threads
Intel® UHD Graphics 730
Supports DDR5 memory up to 4800 MT/s data rate

Intel® 13th Generation Core™ i5 Processors

Intel® Core™ i5 13500E Processor[1,2,3]
65W
2.4 GHz base frequency
Up to 4.6 GHz max. turbo frequency with Intel® Turbo Boost Technology3
24 MB cache, 14 cores, 20 threads
Intel® UHD Graphics 770
Supports DDR5 memory up to 4800 MT/s data rate
Supports Intel® vPro® Technology and Intel® Stable Image
Platform Program (SIPP) 4

Intel® Core™ i5 13500TE Processor[1,2,3]
35W
1.3GHz base frequency
Up to 4.5 GHz max. turbo frequency with Intel® Turbo Boost Technology3
24 MB cache, 14 cores, 20 threads
Intel® UHD Graphics 770
Supports DDR5 memory up to 4800 MT/s data rate
Supports Intel® vPro® Technology and Intel® Stable Image
Platform Program (SIPP) 4

Intel® 13th Generation Core™ i7 Processors

Intel® Core™ i7 13700E Processor[1,2,3]
65W
1.9 GHz base frequency
Up to 5.1 GHz max. turbo frequency with Intel® Turbo Boost Technology3
30 MB cache, 16 cores, 24 threads
Intel® UHD Graphics 770
Supports DDR5 memory up to 5600 MT/s data rate
Supports Intel® vPro® Technology and Intel® Stable Image
Platform Program (SIPP)4

Intel® 13th Generation Core™ i9 Processors

Intel® Core™ i9 13900E Processor[1,2,3]
65W
1.8 GHz base frequency
Up to 5.2 GHz max. turbo frequency with Intel® Turbo Boost Technology3
36 MB cache, 24 cores, 32 threads

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

Intel® UHD Graphics 770
Supports DDR5 memory up to 5600 MT/s data rate
Supports Intel® vPro® Technology and Intel® Stable Image
Platform Program (SIPP)4

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® 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 www.intel.com/technology/turboboost for more information.
3. Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See http://intel.com/vpro
NOTE: S-Processor 6+2 DDR4 2666 MT/s 2 DPC UDIMM is supported when channel is populated with the same UDIMM part number

Redundant Array of Independent Drives (RAID)

Flexible implementation:

- DriveLock is supported while in RAID mode. Users can manage the DriveLock password from within F10 Setup. Locked drives will be displayed as such in the RAID option ROM interface.
- Hard drive information can be viewed within F10 Setup while in RAID mode. Previously, the hard drives will not appear in Drive Configuration when switching to RAID mode.
- 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.

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

Memory

Type
DDR5-4800 Memory DIMMs, transfer rates up to 4800 MT/s

Maximum
128GB

Number of Slots
4 UDIMM

Memory Upgrades
Both slots are customer upgradeable/accessible.

Key Benefits of DDR5 Memory
Dual channel configuration – HP Engage Flex Pro features motherboards designed with two memory channels instead of a single channel.
Reduce system latencies and significantly improve your system performance with dual channel memory configurations by utilizing the theoretical bandwidth of two memory modules instead of one.
Expect fast start-up times with reduced delays during routine operations and system maintenance functions.
Meet everyday workloads head on, and run more programs simultaneously. Easily toggle back and forth between several open applications with noticeable speed.

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:

Supports up to 128 GB of DDR5 SDRAM using UDIMM modules.

8 GB (1 x 8 GB)
16 GB (2 x 8 GB)
16 GB (1 x 16 GB)
32 GB (4 x 8 GB)
32 GB (2 x 16 GB)
32 GB (1 x 32 GB)
64 GB (4 x 16 GB)
64 GB (2 x 32 GB)
128 GB (4 x 32 GB)

* For 8GB configurations, there can only be one installation per channel.

NOTE: Memory modules support data transfer rates up to 4800 MT/s; actual data rate is determined by the system's configured processor and memory configuration. See processor specifications for supported memory data rate.
NOTE: All memory slots are customer accessible / upgradeable.
NOTE: S-Processor 6+2 DDR5 4800 MT/s 2 DPC UDIMM is supported when channel is populated with the same UDIMM part number.

Storage

3.5 inch SATA Hard Disk Drives (HDD)

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2

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

1 TB 7200RPM 3.5in SATA HDD	X	
2 TB 7200RPM 3.5in SATA HDD	X	
4 TB 7200RPM 3.5in SATA HDD	X	

2.5 inch SATA Hard Disk Drives (HDD)

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2
1 TB 7200RPM 2.5in SATA HDD	X	X

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2
256 GB M.2 2280 PCIe NVMe Value SSD	X	X
512 GB M.2 2280 PCIe NVMe Value SSD	X	X
1 TB M.2 2280 PCIe NVMe Value SSD	X	X
256 GB M.2 2280 PCIe NVMe OPAL SSD	X	X
512 GB M.2 2280 PCIe NVMe OPAL SSD	X	X
512 GB M.2 2280 PCIe NVMe Three Layer Cell SSD	X	X
1 TB M.2 2280 PCIe NVMe Three Layer Cell SSD	X	X
2 TB M.2 2280 PCIe NVMe Three Layer Cell SSD	X	X
4 TB M.2 2280 PCIe NVMe Three Layer Cell SSD	X	X

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2
HP 9.5mm Slim DVD-ROM Drive[1]	X	
HP 9.5mm Slim DVD Writer Drive[2]	X	
HP 9.5mm SuperMulti DVDRW	X	

1. HD-DVD disks cannot be played on this drive. No support for DVD-RAM. Actual speeds may vary. Don't copy copyright-protected materials. Double Layer discs can store more data than single layer discs. Discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.
2. Don't copy copyright-protected materials.
3. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 64 GB (for Windows 11) of system disk is reserved for the system recovery software.

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

Security

Trusted Platform Module (TPM) 2.0[1]
Stringent security (via BIOS)[2]
SATA port disablement (via BIOS)
Drive lock
RAID configurations
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)
& Intrusion Sensor
Intel® Identity Protection Technology (IPT)[3]
Wall Mount (sold separately)
Support for chassis cable lock devices
Support for chassis padlock devices

[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.
[3] 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 Components (availability may vary by country)

I/O Ports

USB	USB 2.0: Rear: Two (2) USB 3.2 Gen1 Type A: Front: Two (2) Rear: Three (2, 1 charging)
USB 24V	One (1) 24V powered USB (optional)
Serial	Up to six (6) RS-232 (power configurable) optional ports
Parallel	One port available as an option*
USB+PWR 12V	Two (2) USB+PWR 12V cards optional (three (3) 12 Volt USB+ PWR per card) for a total of 6*
RJ-12	One (1) RJ-12 Cash Drawer port (optional)
Video	One (1) DisplayPort™ v1.4 and up to two additional (2) DisplayPort™ v1.4 as options Up to two (2) optional HDMI or VGA ports.
DVI output	Available via optional DisplayPort™ to DVI Adapter
Audio	Rear: Line input (supports microphone or line input) and optional line out All ports are 3.5mm in diameter
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

Technical Specifications

Slots

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2
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 v4.0 x1 - Two (2) each: 4.2" full height, 6.6" length, 10W max. power Serial PCIe x1 Full Height PCA Idle: 0.95W @3.3V Working: 1.14W@3.3V	N/A
Half-Height	Total of Two (2) Half-Height: PCIe v4.0 x16 (wired as x16) - One (1) each: 2.5 low profile, 6.6" length, 75W max. power PCIe v4.0 x16 (wired as x4) - One (1) each: 2.5" low profile, 6.6" length, 25W max. power Serial PCIe x1 Low profile PCA Idle: 0.95W @3.3V Working: 1.14W@3.3V	Total of Four (4) Half-Height: PCIe v4.0 x16 (wired as x16) One (1) each: 2.5 low profile, 6.6" length, 75W max. power PCIe v4.0 x16 (wired as x4) - One (1) each: 2.5" low profile, 6.6" length, 25W max. power PCIe v4.0 x4 (wired as x2) - One (1) each: 2.5" low profile, 6.6" length, 10W max. power PCIe v4.0 x4 (wired as x2) - One (1) each: 2.5" low profile, 6.6" length, 10W max. power Serial PCIe x1 Low profile PCA Idle: 0.95W @3.3V Working: 1.14W@3.3V

NOTE: Use of full-height slots requires optional PCI or PCIe Riser Card

Bays

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2
Internal HDD (3.5")	2	N/A
Internal HDD (2.5")	N/A[1]	2
External	1 each 5.25"	N/A
Storage M.2	2	2

[1]2.5" drives can be supported with a caddy

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® I219-LM 10/100/1000 Integrated NIC

Intel® Wi-Fi 6E- AX 211 802.11a/b/d/e/g/h/i/k/n/r/u/v/w/ac/ax (2x2) Wi-Fi and Bluetooth® 5.3 Combo wireless Card vPro®

Technical Specifications

Intel® Wi-Fi 6E- AX 211 802. 11a/b/d/e/g/h/i/k/n/r/u/v/w/ac/ax (2x2) Wi-Fi and Bluetooth® 5.3 Combo wireless Card

Realtek® RTL8822BE 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo Card

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® UHD Graphics 770
Intel® UHD Graphics 730
Intel® UHD Graphics 710

Discrete:

NVIDIA® Quadro T1000 8GB Graphics Card

NVIDIA® RTX A2000 12GB Graphics Card

HP DisplayPort™ to DVI-D Adapter

HP DisplayPort™ to VGA Adapter

HP DisplayPort™ to HDMI True 4K Adapter

HP Type-C™ to DisplayPort™ Adapter

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.

Multimedia

High Definition Audio (integrated) with Realtek ALC3252 codec (all ports are stereo)

Line-out and Line-In rear Port (3.5mm)

Line-out rear port (optional)

Internal Speaker (standard)

Input/Output Devices

HP 128 USB Laser Mouse (optional)

HP 320K USB Optical Mouse (optional)

HP 125 USB Mouse (optional)

HP 125 USB Keyboard (optional)

HP 320K USB Keyboard (optional)

Miscellaneous Devices and Configurations

HP Serial Port Adapter

HP Tower Stand

HP Engage Flex Pro PCI Riser Assembly[1]

HP Engage Flex Pro PCIe Riser Assembly[1]

24 Volt Powered USB + Cash Drawer Port Module

Three (3) port 12 Volt USB + Pwr Card

Two (2) port RS232 Serial (power configurable) COM 3 & 4 port card[1]

[1]Not available on HP Engage Flex Pro-C

Weights & Dimensions

(configured with 1 HDD)

	HP Engage Flex Pro G2	HP Engage Flex Pro-C G2
Chassis (H x W x D)	3.94” x 13.27” x 15.12” 100mm x 337mm x 384mm	3.94” x 11.81” x 11.89” 100mm x 300mm x 302mm
System Volume	790.5 cu in, 12940.8 cm^3	553.3 cu in, 9060 cm^3
Packaging (H x W x D)	L489 x D239 x H518 mm (MPP Cushion) (19.25” x 9.41” x 20.39”) L499 x D229 x H528 mm (EPE Cushion) (19.65” x 9.02” x 20.79”)	H 499 x W 229 x D 400 mm 19.6” x 9” x 15.75”
System Weight*	4.7 kg 10.4 lb	3.9kg 8.6 lb
Shipping Weight*	7.4 kg 16.2 lb (w/ EPE cushions) 8.2 kg 18.0 lb (w/ MPP cushions)	6.5 kg 14.4 lb (w/ EPE cushions) 6.9 kg 15.1 lb (w/ MPP cushions)
Max Supported Weight (desktop orientation)	77 lb 35 kg	77 lb 35 kg

* Exact weight depends on configuration

Technical Specifications

Unit Environment and Operating Conditions

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)	
Shock (non repetitive)	**HP Engage Flex Pro G2** Operating: ½ Sine, 40G, 2ms Non-operating: ½ Sine, 165 cm/s, 2~3ms Non-operating square: 422 cm/s, 40G	**HP Engage Flex Pro-C G2** Operating: ½ Sine, 40G, 2ms Non-operating: ½ Sine, 165 cm/s, 2~3ms Non-operating square: 457 cm/s, 40G
Vibration	Operating random: 1.05g (rms), 5-300 Hz, up to 0.01g²/Hz Non-operating random: 2.09g (rms), 5-500 Hz, up to 0.015 g²/Hz	

* 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.

	HP Engage Flex Pro G2	**HP Engage Flex Pro-C G2**
Power Supply	250-watt – EPA92 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 240 VAC	
Rated Line Frequency	50/60 Hz	
Operating Line Frequency Range	47 – 63 Hz	
Rated Input Current	3A Efficiency 90/92/89% at 20/50/100% load	
Power Supply Fan	90 mm variable speed fan	70 mm variable speed fan
ENERGY STAR Compliant	ENERGY STAR® certified configurations available	
Power Cord Length	6.0ft (1.83m)	
Current Leakage (NFPA99:2012)	Less than 500 microamps of leakage current at 264 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.	

Technical Specifications

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:
  - 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 Removal
- Green Pull Tabs, and Quick Release Latches for easy Identification

SOFTWARE COMPONENTS AND APPLICATION WITH WINDOWS

BIOS
HP BIOSphere Gen6[1]
HP Secure Erase[2]
Absolute Persistence Module[3]
HP Drive Lock & Automatic Drive Lock[4]
BIOS Update via Network
HP Wake on WLAN

Software
HP Desktop Support Utilities
HP Connection Optimizer[5]
HP Easy Clean
myHP
HP Privacy Settings
HP PC Hardware Diagnostics
Touchpoint Customizer for Commercial
HP Notifications
HP Presence Aware[7]
HP Setup Integrated OOBE
HP Support Assistant[8]
HP Noise Cancellation Software
HP QuickDrop[9]
Microsoft Defender
Buy Microsoft Office (sold separately)
HP Smart Support[10]

Manageability Features
HP Driver Packs (download)[11]
HP Client Catalog (download)
HP Image Assistant (download)
HP Manageability Integration Kit for Microsoft System Center Configuration Management Gen4 (download)[12]
Ivanti Management Suite (download)[13]
HP Cloud Recovery[14]
HP Client Management Script Library (download)

Security Management
HP Pro Security Edition (optional)[15]
HP Client Security Manager Gen7[16]
HP Sure Sense[17]
HP Sure Admin[18]
HP Sure Click[19]
HP Sure Start Gen6[20]
HP Sure Run Gen4[21]
HP Sure Recover Gen4[22]
HP Tamper Lock
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified)

1. HP BIOSphere Gen6 features may vary depending on the platform and configuration.
2. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.

Technical Specifications

3. Absolute Persistence Module: 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.
4.Drive Lock is not supported on NVMe drives.
5.HP Connection Optimizer requires Windows 10.
7.HP Presence Aware requires a proximity sensor that is available on select EliteBooks and requires Windows Hello for authentication.
8.HP Support Assistant requires Windows and Internet access.
9. HP Quick Drop requires Internet access and Windows 10 or higher PC preinstalled with HP QuickDrop app and either an Android device (phone or tablet) running Android 7 or higher with the Android HP QuickDrop app, and /or an iOS device (phone or tablet) running iOS 12 or higher with the iOS HP QuickDrop app.
10. HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights and is available preinstalled on select products, thru HP Factory Configuration Services; or it can be downloaded. For more information about how to enable HP Smart Support or for download, please visit http://www.hp.com/smart-support .
11.HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
12. HP Manageability Integration Kit can be downloaded from http://www.hp.com/go/clientmanagement
13.Ivanti Management Suite subscription required.
14. HP Cloud Recovery is available for Z by HP, HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired network connection. **NOTE:** You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: https://support.hp.com/us-en/document/c05115630.
15.HP Pro Security Edition is available preloaded on select HP PCs and includes HP Sure Click Pro and HP Sure Sense Pro. 3-year license required. The HP Pro Security Edition software is licensed under the license terms of the HP End User License Agreement (EULA) that can be found at: https://h30670.www3.hp.com/ecommerce/common/disclaimer.do#EN_US as modified by the following: “7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for thirty-six (36) months thereafter (“Initial Term”). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.” HP Pro Security Edition is optimized for the SMB environment and ships pre-configured - manageability is optional. The HP Pro Security Edition supports a limited tool set that can be used by the HP Manageability Integration Kit which can be downloaded from http://www.hp.com/go/clientmanagement.
16.HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.
17.HP Sure Sense is available on select HP PCs and is not available with Windows10 Home.
18. HP Sure Admin requires Windows 10 or higher, HP BIOS, HP Manageability Integration Kit from http://www.hp.com/go/clientmanagement and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.
19. HP Sure Click requires Windows 10 or 11 Pro or higher. See https://bit.ly/2PrLT6A_SureClick for complete details.
20. HP Sure Start Gen6 is available on select HP PCs.
21. HP Sure Run Gen4 is available on select Windows 10 or 11 Pro or higher based HP Pro, Elite and Workstation PCs with Intel® or AMD processors.
22. HP Sure Recover Gen4 is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

Technical Specifications

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

Technical Specifications - Audio

High Definition Audio

Type	Integrated
HD Stereo Codec	Conexant ALC3252
Audio I/O Ports	Rear Line-In/Microphone input (47-K ohm Input Impedance, function is configurable by audio driver) Line-in and Line-out, both on rear. All ports are 3.5mm in diameter
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 rear jack 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 (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® I219-LM 1 Gigabit Network Connection LOM (vPro®)

Connector	RJ-45
System Interface	PCI (Intel proprietary) + SMBus
Memory	24 KB FIFO packet buffer memory
Data rates supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; 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
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
Security & Manageability	Intel® vPro® support with appropriate Intel® chipset components

Intel® I225-LM 2.5 Gigabit Network Connection LOM (vPro®)

Connector	RJ-45
System Interface	PCI (Intel proprietary) + SMBus
Data rates supported	10 Mbit/s operation (10BASE-T; IEEE 802.3i; 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)

Technical Specifications - Communications

	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 (Hash Mode Only) Jumbo Frame 9K
Power consumption	Cable Disconnetion: 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 modern standby or sleep state (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
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
Security & Manageability	Intel® vPro® support with appropriate Intel® chipset components

Intel® Wi-Fi 6E* AX211 + Bluetooth®5.3 (802.11ax 2x2, vPro®, supporting gigabit data rate**) vPro®

Wireless LAN standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
Interoperability	Wi-Fi CERTIFIED™
Frequency band	802.11b/g/n/ax • 2.402 – 2.482 GHz 802.11a/n/ac/ax

Technical Specifications - Communications

	• 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) • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
Security[2]	• IEEE and Wi-Fi CERTIFIED™ 64/128bit 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 • WPA3 certification • IEEE 802.11i • WAPI
Network architecture models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output power	• 802.11b : +17dBm minimum • 802.11g : +16dBm minimum • 802.11a : +17dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +13dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum • 802.11ac VHT160(5GHz) : +10dBm minimum • 802.11ax HE40(2.4GHz) : +12dBm minimum • 802.11ax HE80(5GHz) : +10dBm minimum • 802.11ax HE160(5GHz) : +10dBm 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 Sensitivity	•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(VHT80): -84dBm maximum • 802.11ac, MCS9(VHT80): -59dBm maximum • 802.11ac, MCS9(VHT160): -58.5dBm maximum

Technical Specifications - Communications

	•802.11ax, MCS11(HE40): -57dBm maximum •802.11ax, MCS11(HE80): -54dBm maximum •802.11ax, MCS11(HE160): -53.5dBm 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 with CNVi Interface	
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230: 2.8g 2. Type 126: 1.3g	
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	

HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.1 Wireless Technology

Bluetooth® Specification	4.0/4.1/4.2/5.0/5.1 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 Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
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
Power Management Certifications	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

Technical Specifications - Communications

	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) BT5.1 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range
Security & Manageability	Intel® vPro® support with appropriate Intel® chipset components

*Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs
**Wi-Fi 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

Intel® Wi-Fi 6E* AX201 + Bluetooth® 5.3 (802.11ax 2x2, non-vPro®, supporting gigabit data rate**) non-vPro®

Wireless LAN standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
Interoperability	Wi-Fi CERTIFIED™
Frequency band	802.11b/g/n/ax • 2.402 – 2.482 GHz 802.11a/n/ac/ax • 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) • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum

Technical Specifications - Communications

	OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
Security[2]	• IEEE and Wi-Fi CERTIFIED™ 64/128bit 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 • WPA3 certification • IEEE 802.11i • WAPI
Network architecture models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output power	• 802.11b: +17dBm minimum • 802.11g: +16dBm minimum • 802.11a: +17dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +13dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum • 802.11ac VHT160(5GHz) : +10dBm minimum • 802.11ax HE40(2.4GHz) : +12dBm minimum • 802.11ax HE80(5GHz): +10dBm minimum • 802.11ax HE160(5GHz): +10dBm 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 Sensitivity	•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(VHT80): -84dBm maximum • 802.11ac, MCS9(VHT80): -59dBm maximum • 802.11ac, MCS9(VHT160): -58.5dBm maximum •802.11ax, MCS11(HE40): -57dBm maximum •802.11ax, MCS11(HE80): -54dBm maximum •802.11ax, MCS11(HE160): -53.5dBm 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 with CNVi Interface
Dimensions	3. Type 2230: 2.3 x 22.0 x 30.0 mm 4. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	3. Type 2230: 2.8g 4. Type 126: 1.3g

Technical Specifications - Communications

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	

HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.1 Wireless Technology

Bluetooth® Specification	4.0/4.1/4.2/5.0/5.1 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 Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth® component shall operate as a Class II Bluetooth® device with a maximum transmit power of +9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
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
Power Management Certifications	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 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) BT5.1 ESR9/10 Compliance

Technical Specifications - Communications

	LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range
Security & Manageability	Intel® vPro® support with appropriate Intel® chipset components

*Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs
**Wi-Fi 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

Realtek RTL8852AE 802.11ax 2x2 Wi-Fi* + Bluetooth® 5.3 (802.11ax 2x2, supporting gigabit data rate**)

Wireless LAN standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
Interoperability	Wi-Fi CERTIFIED™ modules
Frequency band	802.11b/g/n/ax • 2.402 – 2.482 GHz 802.11a/n/ac/ax • 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) • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz)
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM
Security[2]	• IEEE and Wi-Fi CERTIFIED™ 64/128bit 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 • WPA3 certification • IEEE 802.11i • WAPI
Network architecture models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points

Technical Specifications - Communications

Output power	• 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 • 802.11ax HE40(2.4GHz) : +10dBm minimum • 802.11ax HE80(5GHz) : +10dBm minimum
Power Consumption	• Transmit mode:2.5 W • Receive mode:2 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode :50 mW (WLAN unassociated) • Connected Standby/Modern Standby: 10mW • Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity	• 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 • 802.11ax, MCS11(HE40): -57dBm maximum 802.11ax, MCS11(HE80): -54dBm 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	1. Type 2230: 2.3 x 22.0 x 30.0 mm 5. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8g 5. Type 126: 1.3g
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	

HP Integrated Module with Bluetooth® 4.0/4.1/4.2/5.1/5.2 Wireless Technology

Bluetooth® Specification	4.0/4.1/4.2/5.0/5.1/5.2 Compliant
Frequency Band	2402 to 2480 MHz

Technical Specifications - Communications

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 Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
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
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
Power Management Certifications	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 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) BT5.1 ESR9/10 Compliance LE Advertisement Extensions Channel Selection Algo Limited High Duty Cycle Non-Connectable Advertising 2Mbps LE LE Long Range
Security & Manageability	Intel® vPro® support with appropriate Intel® chipset components

*Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs
**Wi-Fi 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

HP Flex 1GbE Fiber LC Single Port

Connector	Fiber
Cabling	I GbE over Category OM1 (or better) up to 100m
Controller	Microchip LAN7801
Data rates supported	100/1000 Mbps

Technical Specifications - Communications

Compliance	IEE 802.1q priority enconding/tagging (QoS, CoS) IEE 802.1q VLAN tagging IEE 802.3x flow control
Bus Architecture	USB
Power requirement	Requires 3.3V (Integrated regulators for code Vdc)
Boot ROM Support	Yes
Network transfer mode	Full duplex; Half duplex
Network Transfer rate	100BASE-X (Half-duplex) 100Mbps 1000BASE-X (Half-duplex) 1000Mbps 1000BASE-X (Full-duplex) 2000Mbps
Operating temperature	32° to 95° F (0° to 35°C)
Operating System Driver Support	Windows 11 64-Bit Windows 10 64-Bit Linux®

1. LPWAN (also called Mobile Narrowband) does not support mobile broadband use.

Technical Specifications - Graphics

Intel® UHD Graphics (integrated)

VGA Controller	Integrated
DisplayPort™ 1.4	Multimode capable; supports HDCP (on standard DisplayPort™ and up to 1 optional port), 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 (on up to 1 HDMI port option) Supports BT2020 and HDR playback (7th Gen processors only)
VGA (optional)	VGA ouput
USB-C® DisplayPort™ 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
34" UHD Supported Resolutions and Refresh Rates. Other resolutions may also work.	640x480 60 Hz640x480 67Hz 640x480 72Hz 640x480 75Hz 720x400 70Hz 800x600 60Hz 800x600 75Hz 1024x768 60Hz 1024x768 75Hz 1280x960 60Hz 1280x720 60Hz 1280x1024 60Hz 1280x1024 75Hz 1440x900 60Hz 1440x900 75Hz 1680x1050 60Hz 1920x1080 60Hz 3440x1440 60Hz (Native Resolution) 3440x1440 30Hz

NVIDIA® Quadro T1000 8GB Graphics Card

Memory Clock	2000 MHz
Memory Size (width)	8GB (64-bit)
Memory Type	256M x 32 GDDR6
Max. Resolution (DisplayPort™)	5120x32880@60Hz
Multi Display Support	4 displays
HDCP Compliance	Yes
Rear I/O connectors (bracket)	mini DisplayPort™x4
Cooling (active/passive)	Active fan heatsink

Technical Specifications - Graphics

Total power consumption	<50W
PCB form-factor with bracket	LP PCB with LP bracket

NVIDIA® RTX A2000 12GB Graphics Card

Memory Clock	2000 MHz
Memory Size (width)	12GB (64-bit)
Memory Type	256M x 32 GDDR6
Max. Resolution (DisplayPort™)	5120x2880@60Hz
Multi Display Support	4 displays
HDCP Compliance	Yes
Rear I/O connectors (bracket)	mini DisplayPort™x4
Cooling (active/passive)	Active fan heatsink
Total power consumption	<70W
PCB form-factor with bracket	LP PCB with LP bracket (Dual Width)

Storage

1 TB 7200RPM 3.5in SATA HDD

Capacity	1 TB
Rotational Speed	7,200 rpm
Interface	SATA 6.0 Gb/s
Buffer Size	64 MB
Logical Blocks	1,953,525,168
Seek Time	11 ms (average)
Height (nominal)	1 in/2.54 cm
Width (nominal)	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
Operating Temperature	41° to 131° F (5° to 55° C)

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 7200RPM 3.5in SATA HDD

Capacity	2 TB
Rotational Speed	7,200 rpm
Interface	SATA 6.0 Gb/s
Buffer Size	128 MB
Logical Blocks	3,907,050,336
Seek Time	11 ms (average)
Height (nominal)	1 in/2.54 cm
Width (nominal)	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
Operating Temperature	41° to 131° F (5° to 55° C)

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.

4 TB 7200RPM 3.5in SATA HDD (Enterprise)

Capacity	4 TB
Rotational Speed	7,200 rpm
Interface	SATA 6.0 Gb/s
Buffer Size	256 MB
Logical Blocks	7,814,100,672
Seek Time	8.5 ms (average)
Height (nominal)	1 in/2.54 cm
Width (nominal)	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
Operating Temperature	41° to 131° F (5° to 55° C)

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.

12TB 7200 RPM 3.5in SATA HDD (Enterprise)

Capacity	12 TB
Rotational Speed	7,200 rpm
Interface	SATA 6.0 Gb/s
Buffer Size	Up to 256 MB
Logical Blocks	23,437,770,752
Seek Time	8.5 ms (average)
Height (nominal)	1 in/2.54 cm
Width (nominal)	Media diameter: 3.5 in/8.89 cm Physical size: 4 in/10.2 cm
Operating Temperature	41° to 131° F (5° to 55° C)

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 6.0 Gb/s
Buffer Size	Up to 128 MB
Logical Blocks	1,953,525,168
Seek Time	12 ms (average)
Height (nominal)	0.374 in/9.5 mm
Width (nominal)	2.75 in/70 mm
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.

256GB M.2 2280 PCIe NVMe SSD

Drive Weight	<10g
Capacity	256 GB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 2000MB/s
Maximum Sequential Write	Up to 900MB/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 - Data Storage Drives

512GB M.2 2280 PCIe NVMe SSD

Drive Weight	<10g
Capacity	512 GB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 2200MB/s
Maximum Sequential Write	Up to 1000MB/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.

1TB M.2 2280 PCIe NVMe SSD

Drive Weight	<10g
Capacity	1 TB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 2200MB/s
Maximum Sequential Write	Up to 1600MB/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.

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

Drive Weight	<10g
Capacity	512 GB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 6500MB/s
Maximum Sequential Write	Up to 3500MB/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.

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

Drive Weight	<10g
Capacity	1 TB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 6400MB/s
Maximum Sequential Write	Up to 5000MB/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.

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

Drive Weight	<10g
Capacity	2 TB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 6400MB/s
Maximum Sequential Write	Up to 5000MB/s
Logical Blocks	4,000,797,360
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.

4TB M.2 2280 PCIe NVMe Three Layer Cell SSD

Drive Weight	<10g
Capacity	4 TB
Interface	PCIE Gen4x4
Maximum Sequential Read	Up to 6500MB/s
Maximum Sequential Write	Up to 5000MB/s
Logical Blocks	8,000,797,360
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.

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

Drive Weight	<10g
Capacity	256 GB
Interface	PCIE Gen4
Maximum Sequential Read	Up to 2000MB/s
Maximum Sequential Write	Up to 900MB/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.

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

Drive Weight	<10g
Capacity	512 GB

Technical Specifications - Data Storage Drives

Interface	PCIE Gen4
Maximum Sequential Read	Up to 6400MB/s
Maximum Sequential Write	Up to 3500MB/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.

HP 9.5mm Slim DVD Writer

Height	9.5 mm height
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Dimensions (W x H x D)	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
Weight (max)	Up to 0.31 lb (140g) without bezel
Read Speeds	DVD-R DL - Up to 6X DVD+R - Up to 8X DVD+RW - Up to 8X DVD+R DL - Up to 6X DVD-R - Up to 8X DVD-RW - Up to 6X CD-R - Up to 24X CD-RW - Up to 10X DVD-RW, DVD+RW - Up to 8X DVD-R DL, DVD+R DL - Up to 8X DVD+R, DVD-R - Up to 8X DVD-ROM DL, DVD-ROM - Up to 8X CD-ROM, CD-R - Up to 24X CD-RW - Up to 24X
Access time (typical reads, including settling)	Random: DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) Full stroke: DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical) Stop Time 6 seconds (typical)
Power	Source Slimline SATA DC power receptacle DC Power Requirement 5 VDC ± 5%-100 mV ripple p-p DC Current 5 VDC (< 1000 mA typical, 1600 mA maximum)
Envrionmental conditions (operating – non-condensing)	Temperature 41° to 122° F (5° to 50° C) Relative Humidity 10% to 80% Maximum Wet Bulb Temperature 84° F (29° C)

HP 9.5mm SuperMulti DVDRW

Height	9.5 mm height
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Dimensions (W x H x D)	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
Weight (max)	Up to 0.31 lb (140g) without bezel
Read Speeds	DVD-R DL - Up to 6X DVD+R - Up to 8X DVD+RW - Up to 8X DVD+R DL - Up to 6X DVD-R - Up to 8X DVD-RW - Up to 6X CD-R - Up to 24X CD-RW - Up to 10X DVD-RW, DVD+RW - Up to 8X DVD-R DL, DVD+R DL - Up to 8X DVD+R, DVD-R - Up to 8X DVD-ROM DL, DVD-ROM - Up to 8X CD-ROM, CD-R - Up to 24X CD-RW - Up to 24X
Access time (typical reads, including settling)	Random: DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) Full stroke: DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical) Stop Time 6 seconds (typical)
Power	Source Slimline SATA DC power receptacle DC Power Requirement 5 VDC ± 5%-100 mV ripple p-p

Technical Specifications - Data Storage Drives

	DC Current 5 VDC (< 1000 mA typical, 1600 mA maximum)
Envrionmental conditions (operating – non-condensing)	Temperature 41° to 122° F (5° to 50° C) Relative Humidity 10% to 80% Maximum Wet Bulb Temperature 84° F (29° C)

HP 9.5mm Slim DVD ROM Drive

Height	9.5 mm height
Orientation	Either horizontal or vertical
Interface type	SATA/ATAPI
Dimensions (W x H x D)	5.04 x 0.37 x 5.0 in (128 x 9.5 x 127 mm) without bezel
Weight (max)	Up to 0.31 lb (140g) without bezel
Read Speeds	DVD+R/-R/+RW/ -RW/+R DL /-R DL Up to 8X DVD-ROM Up to 8X CD-ROM, CD-R Up to 24X CD-RW Up to 24X
Access time (typical reads, including settling)	Random DVD-ROM: 170 ms (typical), CD-ROM: 170 ms (typical) Full Stroke DVD-ROM: 320 ms (typical), CD-ROM: 320 ms (typical)
Power	Source Slimline SATA DC power receptacle DC Power Requirement 5 VDC ± 5%-100 mV ripple p-p DC Current 5 VDC (< 1000 mA typical, 1600 mA maximum)
Envrionmental conditions (operating – non-condensing)	Temperature 41° to 122° F (5° to 50° C) Relative Humidity 10% to 80% Maximum Wet Bulb Temperature 84° F (29° C)

HP Anyware Integrated Remote System Controller – Technical Specifications

System-on-Module (SoM)	NVIDIA® Jetson Nano
CPU	Quad-core ARM Cortex-A57 MPCore processor
GPU	NVIDIA® Maxwell with 128 NVIDIA® CUDA® cores
Memory	4GB 64-bit LPDDR4, 1600MHz 25.6 GB/s
Storage	16 GB eMMC 5.11
Upgradeable Storage	uSD Slot (SD4.0)2
Ethernet	10/100/1000Mbps
mDP	Input 1920x1200 60Fps
USB	USB3.1G1 (5Gbps)
TPM	TPM2.0 SLB9672
Power	~4W (Idle)/~17W (Max)
Thermal	Active Cooling
Operating Temperature	Max ambient temperature: 55°C

[1]Virtual Media storage capacity is 4.7GB.
[2]For later expandable storage.

Technical Specifications - Input/Output Devices

HP 125 Wired Keyboard

Dimensions (H x L x W)	17.17 x 5.43 x 0.81 inch (436 x 138 x 20.3mm)
Weight	16.63 oz (471.5g ±30g)
Cable length	1800mm
Keys	104, 105, 107, 109 layout (depending on country)
Operating voltage	5V
Power consumption	50mA - 100mA
Interface	USB
Switch life	10M for all the keys 5M for functional hot keys
Switch type	Plunger with 3mm travel
Operating temperature	10°C to 50°C
Non-operating temperature	-30°C to 65°C
Operating humidity	10°C to 90°C
Non-operating humidity	0°C to 90°C
Sustainability	Greater than 50% post-consumer recycled plastic content and low halogen PCBA
System required	Windows 10 (64 and 32 bit), (UWP) RS4 and above
Approvals	FCC, ICES, CULus, CE, GS, EAC, Ukraine, India BIS, KCC, RCM, BSMI, VCCI
Country of origin	China

HP Wired Desktop 320K Keyboard

Dimensions (H x L x W)	16.77 x 4.36 x 0.65 in (426.2 x 110.9 x 16.7 mm)
Weight	14.57 oz (413g)
Cable length	1800mm
Keys	104, 105, 107, 109 layout (depending on country)
Operating voltage	5V
Power consumption	50mA - 100mA
Interface	USB
Switch life	10M
Switch type	Plunger
Operating temperature	10°C to 50°C
Non-operating temperature	30°C to 65°C
Operating humidity	10°C to 90°C
Non-operating humidity	0°C to 90°C
Sustainability	Greater than 50% post-consumer recycled plastic content and low halogen PCBA
System required	Windows 10 (64 and 32 bit), (UWP) RS4 and above
Approvals	FCC, ICES, CULus, CE, GS, EAC, Ukraine, India BIS, KCC, RCM, BSMI, VCCI
Country of origin	China

HP 125 Wired Mouse

Dimensions (H x L x W)	4.41 x 2.48 x1.42 inch (112 x 63 x 36mm)
Weight	2.83 oz (80.5g ±5g)
Dots per inch (DPI)	1200 DPI

Technical Specifications - Input/Output Devices

Tracking type	Optical Red Sensor[1]
Connectivity	USB
Cable length	1800mm
System requirements	Windows 10 (64 bit and 32 bit) (UWP) RS4 and above
Approvals	FCC, ICES, CULus, CE, GS, EAC, Ukraine, India BIS, KCC, RCM, BSMI, VCCI
Sustainability	Low halogen PCBA.
Country of origin	China

1. Surface Coverage recommendation for Optical Red Sensor: Difuse surface: wooden board, cloth mouse pad

HP 128 Laser Wired Mouse

Dimensions (H x L x W)	4.41 x 2.48 x1.42 inch (112 x 63 x 36mm)
Weight	2.88 oz (81.9g ±5g)
Dots per inch (DPI)	1200 DPI
Tracking type	Laser Sensor[1]
Connectivity	USB
Cable length	1800mm
System requirements	Windows 10 (64 bit and 32 bit) (UWP) RS4 and above
Approvals	FCC, ICES, CULus, CE, GS, EAC, Ukraine, India BIS, KCC, RCM, BSMI, VCCI
Sustainability	Low halogen PCBA.
Country of origin	China

1. Surface Coverage recommendation for Optical Red Sensor: Difuse surface: wooden board, cloth mouse pad

HP Wired Desktop 320M Mouse

Dimensions (H x L x W)	4.08 x 2.49 x 1.39 in (103.8 x 63.4 x 35.5 mm)
Weight	2.67 oz (75.8 g)
Dots per inch (DPI)	1000
Tracking type	Optical Red Sensor
Connectivity	USB
Cable length	1800mm
System requirements	Windows 10 (64 bit and 32 bit) (UWP) RS4 and above
Approvals	FCC, ICES, CULus, CE, GS, EAC, Ukraine, India BIS, KCC, RCM, BSMI, VCCI
Sustainability	Low halogen PCBA.
Country of origin	China

1. Surface Coverage recommendation for Optical Red Sensor: Difuse surface: wooden board, cloth mouse pad

Technical Specifications - Environmental Data

Environmental Data HP Engage Flex Pro G2 Retail System

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®
- US Federal Energy Management Program (FEMP)
- EPEAT® Gold with Climate+ registered configurations available. See www.epeat.net for registration status and tier levels by country.*
- TCO Certified
- China Energy Conservation Program (CECP)
- China State Environmental Protection Administration (SEPA)
- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label*

*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information

Sustainable Impact Specifications

- Ocean-bound plastic in CPU Fan, Speaker
- 10% recycled metal
- 55% post-consumer recycled plastic
- Low halogen
- Outside Box and corrugated cushions are 100% sustainably sourced and recyclable
- Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable
- Bulk packaging available

System Configuration

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

Energy Consumption (in accordance with US ENERGY STAR® test method)	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	24.28 W	24.42 W	23.70 W
Normal Operation (Long idle)	18.14 W	18.31 W	17.80 W
Sleep	3.38 W	3.41 W	3.31 W
Off	2.32 W	2.35 W	2.32 W

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

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	83 BTU/hr	84 BTU/hr	81 BTU/hr
Normal Operation (Long idle)	62 BTU/hr	63 BTU/hr	61 BTU/hr

Technical Specifications - Environmental Data

Sleep	12 BTU/hr	12 BTU/hr	11 BTU/hr
Off	8 BTU/hr	8 BTU/hr	8 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)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	3.49	24.7
Fixed Disk – Random writes	3.84	26.1
Optical Drive – Sequential reads	3.88	27.3

Longevity and Upgrading

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

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

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, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product is 95.6% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	1136 g
	PAPER/Molded Pulp	1008 g
Internal:	PLASTIC/Polyethylene low density - LDPE	40 g

The plastic packaging material contains at least 0.0% recycled content.

The corrugated paper packaging materials contains at least 66.8% recycled content.

RoHS Compliance

HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.

We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.

We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the

scope of the commitment to include further restricted substances as regulations continue to evolve.

To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.

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
- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)
- 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)

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

HP 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 certificates: http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf
footnotes	• Percentage of ocean-bound plastic contained in each component varies by product • Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard. • External power supplies, WWAN modules, power cords, cables and peripherals excluded. • 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers. • Fiber cushions made from 100% recycled wood fiber and organic materials. • Disclaimer: recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams

Technical Specifications - Environmental Data

Environmental Data HP Engage Flex Pro-C G2 Retail System

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®
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- TCO Certified
- China Energy Conservation Program (CECP)
- China State Environmental Protection Administration (SEPA)
- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label*

*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information

Sustainable Impact Specifications

- Ocean-bound plastic in System Fan, Speaker
- 10% recycled metal
- 55% post-consumer recycled plastic
- Low halogen
- Outside Box and corrugated cushions are 100% sustainably sourced and recyclable
- Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable
- Bulk packaging available

System Configuration

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

Energy Consumption (in accordance with US ENERGY STAR® test method)	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	22.68 W	22.74 W	22.34 W
Normal Operation (Long idle)	15.82 W	15.58 W	15.55 W
Sleep	3.58 W	3.61 W	3.58 W
Off	2.46 W	2.42 W	2.42 W

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

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	78 BTU/hr	78 BTU/hr	76 BTU/hr
Normal Operation (Long idle)	54 BTU/hr	53 BTU/hr	53 BTU/hr

Technical Specifications - Environmental Data

Sleep	12 BTU/hr	12 BTU/hr	12 BTU/hr
Off	8 BTU/hr	8 BTU/hr	8 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)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	3.34	22.2
Fixed Disk – Random writes	3.37	22.6
Optical Drive – Sequential reads	3.78	25.7

Longevity and Upgrading

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

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

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, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product is 94.5% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	968 g
	PAPER/Paperboard	180 g
	PAPER/Molded Pulp	470 g
Internal:	PLASTIC/Polyethylene low density - LDPE	30 g

The plastic packaging material contains at least 0.0% recycled content.

The corrugated paper packaging materials contains at least 53.9% recycled content.

RoHS Compliance

HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.

We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.

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- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)
- 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.
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- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

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- 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 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 certificates:
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842
and
http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

footnotes

- Percentage of ocean-bound plastic contained in each component varies by product
- Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.
- External power supplies, WWAN modules, power cords, cables and peripherals excluded.
- 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.
- Fiber cushions made from 100% recycled wood fiber and organic materials.
- Disclaimer: recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams

After-Market Options (availability may vary by region)

Graphics Solutions

	Part #
NVDIA RTX A2000 12GB Graphics	5Z7D9AA
NVDIA Quadro T1000 8GB Graphics	5Z7D8AA
HP DisplayPort™ Cable Kit	VN567AA
HP DisplayPort™ To DVI-D Adapter	FH973AA
HP DisplayPort™ to VGA Adapter	AS615AA
HP HDMI Standard Cable Kit	T6F94AA
HP UHD USB Graphics Adapter	N2U81AA
HP DisplayPort™ to HDMI True 4k Adapter	2JA63AA

Hard Disk Storage Drives

	Part #
HP 1TB SATA (6.0Gb/s) Hard Disk Drive*	LQ037AA
HP Removable SATA Hard Drive Enclosure (frame & carrier)*	RY102AA
HP Removable SATA Hard Drive Enclosure (carrier only)*	RY103AA
HP 256GB 2280 PCIe NVMe Value w/Heatsink Solid State Drive	9U753AA
HP 512GB 2280 PCIe NVMe Value w/Heatsink Solid State Drive	9U754AA
HP 1TB 2280 PCIe NVMe Value w/Heatsink Solid State Drive	9U755AA
HP 512GB 2280 PCIe NVMe Three Layer Cell w/Heatsink Solid State Drive	9U756AA
HP 1TB 2280 PCIe NVMe Three Layer Cell w/Heatsink Solid State Drive	9U757AA
HP 2TB 2280 PCIe NVMe Three Layer Cell w/Heatsink Solid State Drive	9U758AA
512GB 2280 PCIe NVMe Self Encrypted OPAL2 w/Heatsink Solid State Drive	9U759AA

*Not compatible with Engage Flex Pro-C G2

Input / Output Devices

	Part #
HP 125 Wired Keyboard	266C9AA
HP Wired Desktop 320K Keyboard	9SR37AA
HP 125 Wired Mouse	265A9AA
HP 128 Laser Wired Mouse	265D9AA
HP Wired Desktop 320M Mouse	9VA80AA

System Memory

	Part #
HP 8GB DDR5-4800 MHz UDIMM	4M9X9AA
HP 16GB DDR5-4800 MHz UDIMM	4M9Y0AA
HP 32GB DDR5-4800 MHz UDIMM	4M9Y2AA

Multimedia Devices

	Part #
HP 9.5mm DVD-ROM Drive*	N1M41AA

After-Market Options (availability may vary by region)

HP DVD-Writer Drive*	QS208AA

*Not compatible with Engage Flex Pro-C G2

Security Devices

	Part #
HP Business PC Security Lock	3XJ17AA

After-Market Options (availability may vary by region)

Retail Solutions Specific Accessories

	Part #
HP L7010t – 10.1" Retail Touch Monitor	T6N30AA
HP L7014 14" Retail Non-touch Monitor	T6N31AA
HP L7014t 14" Retail Touch Monitor	T6N32AA
HP L7016t – 15.6" Retail Touch Monitor	V1X13AA
HP Engage One 10.1in Touch Display (Black / White / No Stand + VESA)	1XD81AA/3FH67AA/3F1W9AA
HP Engage One 10.1in Non-Touch Display (Black / White / No Stand + VESA)	1XD80AA/3FH66AA/3F1W8AA
HP Engage 14 FHD No Stand+No VESA Monitor	8X037AA
HP Engage 14t FHD No Stand+No VESA Monitor	8X078AA
HP Engage 16t FHD No Stand Monitor	8Q3N2AA
HP Engage 16t MSR FHD No Stand Monitor	8Q3W5AA
HP Engage 15t XGA No Stand Monitor	67Q84AA
HP Engage 6.6 inch Display (Black / White)	9YH48AA/156N8AA
HP Engage 6.6 inch Display with Ingenico Moby 5500M	156P0AA
HP Engage 6.6 inch Display for Ingenico Moby 5500M	10P74AA
HP Engage 6.6 inch Pole Display (Black / White)	10P79AA/156N9AA
HP Engage 2x20 Customer Facing Pole Display	6K553AA
HP Anywhere Integrated Flex Pro Remote System Controller	9B141AA
HP Z2 Mini/Z2 Tower/Z4/Z6 Depth Adjustable Fixed Rail Rack Kit	2A8Y5AA
HP Engage Imaging Barcode Scanner II	5YQ08AA
Datalogic 3450VSi Presentation Scanner	7UZ38AA
Datalogic 1500i Presentation Scanner	9BU50AA
Datalogic 4090 WRLS Charging Base	4P775AA
Datalogic 4190 WRLS Charging Base	4P776AA
Datalogic Gryphon GBT4500 2D WRLS BCS (w/o Digimarc / w Digimarc)	4P886AA/4P887AA
HP Engage One Prime Barcode Scanner (Black / White)	638L9AA/638M0AA
HP Engage 2D G2 Barcode Scanner (Black / White)	6Y2V4AA/6Y2V5AA
Epson TM-T88VI Serial Ethernet USB	2HV25AA
HP Value Thermal Receipt Printer	4AK33AA
Epson H6000V Hybrid Printer	4ZE21AA
Epson TM-T88VI PUSB Printer only	6BC94AA
Epson TM-T20IIIL Serial USB	340U3AA
HP Engage Serial Ethernet USB Thermal Printer	299U7AA
HP Engage PUSB Thermal Printer	299V7AA
Epson TM-m30II (Black / White)	340U1AA/340U2AA
HP Heavy Duty Cash Drawer	FK182AA
HP Standard Duty Cash Drawer	QT457AA
HP USB Standard Duty Cash Drawer	E8E45AA

After-Market Options (availability may vary by region)

HP Heavy Duty Cash Drawer Random Locks	8QX99AA
HP Engage One Prime Cash Drawer (Black / White)	638M5AA/638M6AA
HP Standard Duty Till w/Lockable Lid	QT458AA
HD Cash Drawer Till 5B5C	31G54AA

*Not compatible with Engage Flex Pro-C
**Not compatible with Engage Flex Pro
***Requires Riser card accessory for compatibility with Engage Flex Pro. Riser not required or available for Engage Flex Pro-C

	Part #
HP Engage Flex Pro-C G2 3 Pack Dust Filters**	9R6G1AA
HP Engage Flex Pro G2 3 Pack Dust Filters*	9R6G0AA
HP Engage Flex Pro Wall Mount/Security Sleeve*	4VW75AA
HP Engage Flex Pro-C Wall Mount/Security Sleeve**	4VW76AA

*Not compatible with Engage Flex Pro-C
**Not compatible with Engage Flex Pro
***Requires Riser card accessory for compatibility with Engage Flex Pro. Riser not required or available for Engage Flex Pro-C

Date of change:	Version History:		Description of change:
July 25, 2023	From v1 to v2	Changed	Environmental Data sections, changed images from pages 2 and 4
November 21, 2023	From v2 to v3	Changed	Format
January 25, 2024	From v3 to v4	Changed	ENVIRONMENTAL DATA section
April 8, 2024	From v4 to v5	Changed	Format

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The information contained herein is subject to change 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.