# QuickSpecs

## Overview

**HP 200 G3 AiO**
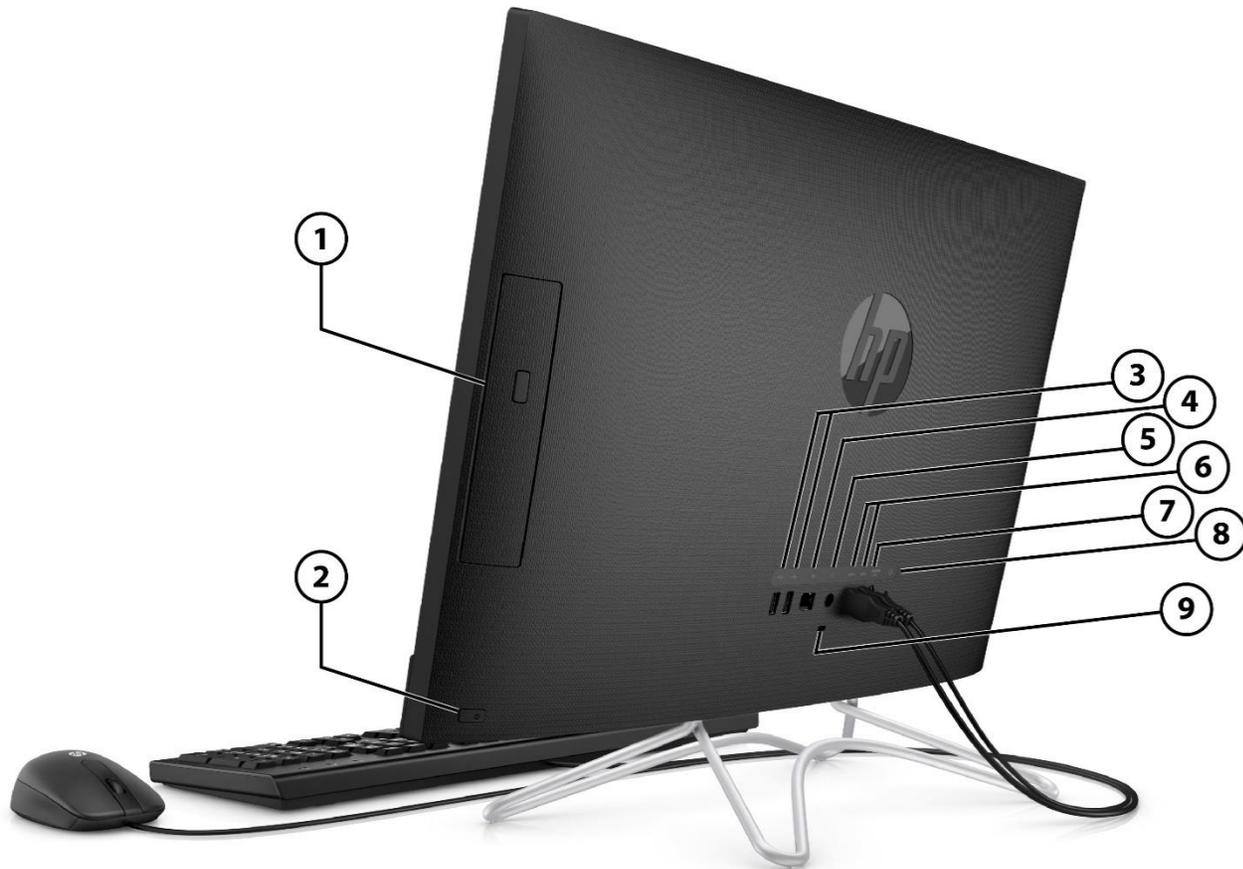


**Front**

1. Webcam
2. Webcam privacy shutter
3. Microphone
4. Speakers

Not all configuration components are available in all regions/countries.
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## Overview

**HP 200 G3 AiO**

**Rear**

1. Optical disc drive
2. Power button
3. Two (2) USB 2.0 ports
4. RJ-45 (network) jack
5. Power connector

6. Two (2) USB 3.1 Gen 1 ports
7. HDMI out connector
8. Microphone/Headphone Combo Jack
9. Security cable slot

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## Overview

### At a Glance

- Choice of Windows 10 Home, Windows 10 Professional, and FreeDOS 2.0

- Integrated All-in-One form factor

- 21.5-inch diagonal widescreen Full HD anti-glare display

- Latest Intel® 8th generation Core™ processors, featuring integrated Intel® HD Graphics

- Up to 16GB of DDR4 Synchronous Dynamic Random-Access Memory (SDRAM)

- Integrated 10/100/1000 Gigabit LAN Ethernet Controller

- Wi-Fi 802.11ac wireless connectivity

- Integrated HD audio card and stereo speakers

- Integrated HD camera (1280 x 720) with privacy webcam shutter to ensure no accidental recording to safeguard user's privacy

- Expandable storage options with up to 256GB SSD and 2TB HDD

- Optional HP Slim Tray DVD Writer 8X Optical Drive

- 3-in-1 Media Card Reader

- TPM 2.0 support

- Low halogen1 materials, and ENERGY STAR® and EPEAT® certified. See http://www.epeat.net for EPEAT® registration status by country.

- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

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

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

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# Features

## OPERATING SYSTEMS

| | |
|---|---|
| **Preinstalled** | Windows 10 Pro 64[1] |
| | Windows 10 Home 64[1] |
| | Windows 10 Home Single Language 64[1] |
| | Windows 10 Pro 64 (National Academic License)[2] |
| | Microsoft Windows® 10 Enterprise (64 bit) |
| | |
| **Pre-installed (other)** | FreeDOS 2.0 |

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

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

## PROCESSORS

**Intel® 8th Generation Core™ Processors**

8th Generation Intel® Core™ i5-8250U (1.6 GHz, 6 MB cache, 4 cores) Up to 3.4 GHz with Intel® Turbo Boost Technology

8th Generation Intel® Core™ i3-8130U (2.2 GHz, 4 MB cache, 2 cores) Up to 3.4 GHz with Intel® Turbo Boost Technology

**Note:** Multicore 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.

## GRAPHICS

**Integrated**
Intel® UHD Graphics 620

## DISPLAYS

**HP 200 G3 All-in-One 21.5-in FHD Display**
54.61 cm (21.5") diagonal FHD anti-glare LED-backlit (1920 x 1080)

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# Features

## STORAGE AND DRIVES[1]

**M.2 SATA Solid State Drives (SSD)**
128GB 2280 M2 SATA Three Layer Cell Solid State Drive
256GB 2280 M2 SATA Three Layer Cell Solid State Drive

**M.2 PCIe NMVe Solid State Drives (SSD)**
128GB 2280 PCIe NVMe Value Solid State Drive
256GB 2280 PCIe NVMe Value Solid State Drive

**3.5 inch 7200RPM SATA Hard Disk Drives (HDD)**
500GB 7200RPM 3.5in HDD
1TB 7200RPM 3.5in HDD
2TB 7200RPM 3.5in HDD

**Optical Disc Drives**
9.5mm Ultra Slim DVD-Writer

**Media Card Reader**
SD Card Reader with 3-in1 Interface (Supports SD, SDHC, SDXC)

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) is reserved for system recovery software.

## MEMORY

**Maximum**
LPDDR4 SODIMM up to 2400MT/s
**Memory Slots**
2 SODIMM

**Available Configurations**
4GB (4GB x1)
8GB (4GB x2)
8GB (8GB x1)
16GB (16GB x2)

## NETWORKING/COMMUNICATIONS

**Wireless LAN**
Realtek® RTL8821CE 802.11AC 1x1 Wi-Fi M.2 Card[3]

**Ethernet (RJ-45) Integrated**
Realtek® RTL8111HSH-CG Gigabit Ethernet Controller

3.Wireless LAN must be bought at purchase

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# Features

## AUDIO/MULTIMEDIA

### High Definition Audio[4]
Integrated Realtek ALC3247 Audio Codec
High performance integrated stereo speakers
3.5mm combo (microphone/headphone) jack

### Webcams & Mic
Integrated 1MP HD (maximum resolution of 1280 x 720) webcam, Up to 30 frames/sec, microphone included

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

## KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

### Keyboards
HP USB Wired Keyboard

### Mice
HP USB Mouse

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# Features

## SOFTWARE AND SECURITY

### Lifestyle

Bing Search

HP ePrint[5]

Internet Explorer Home Page (MSN or Bing)

### Internet Security and Antivirus

McAfee LiveSafe (30-day subscription)[6]

### HP Support

HP PC Hardware Diagnostics

HP Recovery Manager

HP Support Assistant (HPSA)

### Product Setup

HP Registration

HP JumpStart

### Security Features

Trusted Platform Module (TPM) 2.0 (firmware)[7,8]

Security cable slot

5. HP ePrint requires an internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see http://www.hp.com/go/businessmobileprinting.
6. 30 day trial period. Internet access required to receive updates. First update included. Subscription required for updates thereafter
7. TPM feature will not be supported on machines pre-configured with FreeDOS and Linux
8. In selected countries, machines pre-configured with Windows OS will be shipped with TPM disabled.

## POWER

### Power Supply
**External**
External 89% efficient 65-watt power adapter

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## Features

### WEIGHTS & DIMENSIONS

**Weight**

| | |
|---|---|
| **21.5 Non-Touch Product Weight (Unboxed)** | **Without Stand**<br>4.94 kg, 10.89 lbs |
| | **Basic Stand**<br>5.39 kg, 11.88 lbs |
| **21.5 Shipping Weight (Boxed)** | 7.76 kg, 17.11 lbs |
| **21.5 Shipping Weight (Pallet)** | 260.52 kg, 574.35 lbs |

**Dimension**

| | |
|---|---|
| **21.5 System Dimensions (including Touch, Non-Touch )** | **Without Stand**<br>490.38 x 332.66 x 56.0 mm<br>19.31 x 13.10 x 2.2 in |
| | **Basic Stand**<br>490.38 x 390.6 x 204.11 mm<br>19.31 x 15.38 x 8.04 in |
| **21.5 Shipping Dimensions (Boxed)** | 598 x 248 x 483 mm, 23.55 x 9.77 x 19.02 in |
| **21.5 Shipping Dimensions (Pallet)** | 1200 x 1000 x 2067 mm, 47.24 x 39.37 x 81.38 in |
| **23.8 Pallet Quantity (including Touch, Non-Touch)** | 32 |

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## Features

### UNIT ENVIRONMENT AND OPERATING CONDITIONS[9]

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

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

9. 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.

## PORTS/SLOTS

### Rear I/O Ports
Two (2) USB 2.0 ports
Two (2) USB 3.1 Gen 1 ports
One (1) RJ-45 (network) jack
One (1) HDMI out connector
One (1) Microphone/Headphone Combo Jack
One (1) DC in power

### Bottom I/O Ports
One (1) 3 in 1 Card reader (SD, SDHC, SDXC)

### Internal I/O Ports
One (1) M.2 PCIe x1 2230 (for WLAN)
One (1) M.2 PCIe x4 2280/2230 (for storage)
One (1) SATA storage connector

### Bays
One (1) 3.5" internal storage drive[11]

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## Technical Specifications

### DISPLAYS

**HP 200 G3 All-in-One 21.5-in FHD Display**
54.61 cm (21.5") diagonal FHD anti-glare LED-backlit (1920 x 1080)

| | |
|---|---|
| **Type** | IPS WLED Backlit LCD |
| **Active area (mm)** | 476.064 x 267.786 |
| **Native Resolution (HxV)** | 1920 x 1080 |
| **Aspect ratio** | 16:09 |
| **Pixel pitch (HxV)(mm)** | 0.24795 x 0.24795 |
| **Contrast ratio (typical)** | 1000:1 |
| **Brightness (typical)** | 250nits (cd/m2) |
| **Viewing angle (typical) (HxV)** | 178 ° x 178 ° |
| **Backlight lamp life (to half brightness)** | 30,000 hours minimum |
| **Color support** | Up to 16.7 million colors with the use of FRC technology |
| **Color gamut (typical)** | NTSC 72% |
| **Anti-glare** | Yes |
| **Default color temperature** | Warm (6500K) |

**NOTE**: All performance specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

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## Technical Specifications

### STORAGE AND DRIVES

**HP 500 GB 7.2K SATA 6.0Gb/s 3.5" Hard Disk Drive**

| | |
|---|---|
| Capacity | 500GB |
| Rotational Speed | 7,200 rpm |
| Interface | SATA 6 Gb/s |
| Buffer Size | 32 MB |
| Logical Blocks | 976,773,169 |
| Seek Time | 11 ms (Average) |
| Height | 26.1mm (Max) |
| Width | Media diameter: 3.5 in/8.89 cm<br>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 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

**HP 1 TB 7.2K SATA 6.0Gb/s 3.5" Hard Disk Drive**

| | |
|---|---|
| Capacity | 1TB |
| Rotational Speed | 7,200 rpm |
| Interface | SATA 6 Gb/s |
| Buffer Size | 32 MB |
| Logical Blocks | 1,953,525,169 |
| Seek Time | 13 ms (Average) |
| Height | 26.1mm (Max) |
| Width | Media diameter: 3.5 in/8.89 cm<br>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 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

**HP 2 TB 7.2K SATA 6.0Gb/s 3.5" Hard Disk Drive**

| | |
|---|---|
| Capacity | 2TB |
| Rotational Speed | 7,200 rpm |
| Interface | SATA 6 Gb/s |
| Buffer Size | 64 MB |
| Logical Blocks | 3,907,029,168 |
| Seek Time | 13 ms (Average) |
| Height | 26.1mm (Max) |
| Width | Media diameter: 3.5 in/8.89 cm<br>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 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

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## Technical Specifications

**128 GB 2280 M2 SATA Three Layer Cell Solid State Drive**

| | |
|---|---|
| Drive Weight | < 10g |
| Capacity | 128 GB |
| Height | 2.23mm |
| Length | 80mm |
| Width | 22mm |
| Interface | SATA 3.0 (6Gb/s) |
| Maximum Sequential Read | Up to 515MB/s |
| Maximum Sequential Write | Up to 320MB/s |
| Logical Blocks | 250,069,680 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM |

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

**256 GB 2280 M2 SATA Three Layer Cell Solid State Drive**

| | |
|---|---|
| Drive Weight | < 10g |
| Capacity | 256GB |
| Height | 2.23mm |
| Length | 80mm |
| Width | 22mm |
| Interface | SATA 3.0 (6Gb/s) |
| Maximum Sequential Read | Up to 515MB/s |
| Maximum Sequential Write | Up to 450MB/s |
| Logical Blocks | 500,118,192 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | DIPM; TRIM |

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

**128 GB 2280 PCIe NVMe Value Solid State Drive**

| | |
|---|---|
| Drive Weight | < 10g |
| Capacity | 128 GB |
| Height | 2.23mm |
| Length | 80mm |
| Width | 22mm |
| Interface | PCIE Gen3 |
| Maximum Sequential Read | Up to 770MB/s |
| Maximum Sequential Write | Up to 395MB/s |
| Logical Blocks | 250,069,680 |
| Operating Temperature | 0° to 70°C (32° to 158°F) [ambient temp] |
| Features | APST; ASPM L1.2; NVME spec 1.2 |

**NOTE:** For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

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## Technical Specifications

| **256 GB 2280 PCIe NVMe Value Solid State Drive** | Drive Weight | < 10g |
|---|---|---|
| | Capacity | 256 GB |
| | Height | 2.23mm |
| | Length | 80mm |
| | Width | 22mm |
| | Interface | PCIE Gen3 |
| | Maximum Sequential Read | Up to 1570MB/s |
| | Maximum Sequential Write | Up to 540MB/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 50 GB (for Windows 10) of system disk is reserved for the system recovery software.

## HIGH DEFINITION AUDIO

| **Type** | Integrated |
|---|---|
| **HD Audio Codec** | Realtek ALC3247 Audio Codec |
| **Audio I/O Ports** | Rear 3.5mm combo (microphone/headphone) jack (32 Ohm) supporting CTIA style headset Microphone(2K Ohm) |
| **Analog Audio** | Yes |
| **Internal Speaker** | Yes - Stereo Speaker |
| **DAC Sampling Rates** | 44.1 kHz/48 kHz/96 kHz/192 kHz |
| **ADC Sampling Rates** | 44.1 kHz/48 kHz/96 kHz/192 kHz |

**NOTE**: All performance specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

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## Technical Specifications

### INPUT/OUTPUT DEVICES

| HP USB Wired Keyboard | | |
|---|---|---|
| **Physical Characteristics** | Keys | 104, 105 layout (depending upon country) |
| | Dimensions (L x W x H) | 17.04 x 5.55 x 0.52 in (433 x 141 x13.2 mm) |
| | Weight | 1.54 lb (698g) |
| **Electrical** | Operating voltage | 6 VDC, +/-5% |
| | Power consumption | 35mA (All LED on) |
| | System interface | USB Type A plug connector |
| | ESD | Contact Discharge: 8 KV Air Discharge: 15 KV |
| | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | Microsoft® PC 99 - 2001 | Functionally compliant |
| **Mechanical** | Keycaps | Low-profile design |
| | Switch actuation | 60±10g nominal peak force with tactile feedback |
| | Switch life | 11 million keystrokes (Life tester) |
| | Switch type | Contamination-resistant switch membrane |
| | Key-leveling mechanisms | For all double-wide and greater-length keys |
| | Cable length | 7 ft (1.8 m) |
| | Microsoft PC 99 - 2001 | Mechanically compliant |
| **Environmental** | Acoustics | 43-dBA maximum sound pressure level |
| | Operating temperature | 50° to 122° F (10° to 50° C) |
| | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | Operating shock | 40 g, six surfaces |
| | Non-operating shock | 80 g, six surfaces |
| | Operating vibration | 2-g peak acceleration |
| | Non-operating vibration | 4-g peak acceleration |
| | Drop (out of box) | 27 in (66 cm) on carpet, six-drop sequence |
| | Drop (in box) | 31 in (76.2 cm) on concrete, 16-drop sequence |
| | Approvals | UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC |
| | Ergonomic compliance | TUVGS |
| | Kit contents | Keyboard, QSP |
| | Warranty Card | Product Notice |

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## Technical Specifications

| USB Mouse | | |
|---|---|---|
| **Dimensions**<br>(H x L x W) | 4.21 x 2.64 x 1.52 in (107 x 67 x 38.7 mmm) | |
| **Weight** | 0.19lb (90g) | |
| **Environmental** | Operating temperature | 50° to 122°F (10° to 50° C) |
| | Non-operating temperature | -22° to 140°F (-30° to 60° C) |
| | Operating humidity | 10% to 90%<br>(non condensing at ambient) |
| | Non-operating humidity | 20% to 80%<br>(non condensing at ambient) |
| | Operating shock | 50 g, 6 surfaces |
| | Non-operating shock | 80 g, 6 surfaces |
| | Operating vibration | 2 g peak acceleration |
| | Non-operating vibration | 4 g peak acceleration |
| **Electrical** | Operating voltage | 6 VDC ± 5% |
| | Power consumption | 12 mA |
| **Mechanical** | Connector | USB 2.1 |
| | Type | 3D mouse (3 keys and wheel) |
| | Resolution | 800, 1200, 1600 DPI |
| | Sensor | Pixart PAN3606DL |
| | Tracking speed | 31 inch/sec (max) |
| | Tracking acceleration | 8G(max), 1G=9.8m/s3 |
| | Cable length | 7 ft (1.8 m) |
| | Color | Jack Black |
| | Regulatory Approvals | UL, FCC, CE Mark, TUV GS, VCCI, BSMI, C-Tick, KC |

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## Technical Specifications

### NETWORKING/COMMUNICATIONS

| **Realtek® RTL8111HSH-CG Gigabit Ethernet Controller** | Ethernet Features | 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)<br>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)<br>1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)<br>Auto-Negotiation (Automatic Speed Selection)<br>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s<br>IEEE 802.1p QoS (Quality of Service) Support<br>IEEE 802.1q VLAN support<br>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)<br>IEEE 802.3az EEE (Energy Efficient Ethernet)<br>Jumbo Frame 9K<br>Auto MDI/MDIX Crossover cable detection |
|---|---|---|
| | Power Management | ACPI compliant – multiple power modes<br>Situation-sensitive features reduce power consumption<br>Advanced link down power saving for reducing link down power consumption |
| | Performance Features | TCP/IP/UDP Checksum Offload (configurable)<br>Protocol Offload (ARP & NS)<br>Large send offload and Giant send offload<br>Receiving Side Scaling |
| | Manageability | Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)<br>PXE 2.1 Remote Boot<br>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))<br>Comprehensive diagnostic and configuration software suite<br>Virtual Cable Doctor for Ethernet cable status |
| | Interface | PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ |
| | NIC Device Driver Name | PCIe GBE Ethernet Family Controller |

# Technical Specifications

## WLAN

| | | |
|---|---|---|
| **Realtek® RTL8821CE 802.11AC 1x1 Wi-Fi M.2 Card** | **Wireless LAN Standards** | IEEE 802.11a<br>IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n<br>IEEE 802.11ac |
| | **Interoperability** | Wi-Fi certified |
| | **Frequency Band** | 802.11b/g/n<br>• 2.402 – 2.482 GHz<br>802.11a/n<br>• 4.9 – 4.95 GHz (Japan)<br>• 5.15 – 5.25 GHz<br>• 5.25 – 5.35 GHz<br>• 5.47 – 5.725 GHz<br>• 5.825 – 5.850 GHz |
| | **Data Rates** | • 802.11b: 1, 2, 5.5, 11 Mbps<br>• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)<br>• 802.11ac : MCS0 ~ MCS9, (1SS and 2SS) (20MHz, 40MHz, and 80MHz) |
| | **Modulation** | Direct Sequence Spread Spectrum<br>BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM |
| | **Security[1]** | • IEEE and Wi-Fi compliant 64 / 128 bit WEP encryption for a/b/g mode only<br>• AES-CCMP: 128 bit in hardware<br>• 802.1x authentication<br>• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.<br>• WPA2 certification<br>• IEEE 802.11i<br>• Cisco Certified Extensions, all versions through CCX4 and CCX Lite<br>• WAPI |
| | **Network Architecture Models** | Ad-hoc (Peer to Peer)<br>Infrastructure (Access Point Required) |
| | **Roaming** | IEEE 802.11 compliant roaming between access points |
| | **Output Power[2]** | • 802.11b : +14dBm minimum<br>• 802.11g : +12dBm minimum<br>• 802.11a : +12dBm minimum<br>• 802.11n HT20(2.4GHz) : +12dBm minimum<br>• 802.11n HT40(2.4GHz) : +12dBm minimum<br>• 802.11n HT20(5GHz) : +10dBm minimum<br>• 802.11n HT40(5GHz) : +10dBm minimum<br>• 802.11ac VHT80M(5GHz) : +10dBm minimum |
| | **Power Consumption** | • Transmit mode2.0 W<br>• Receive mode1.6 W<br>• Idle mode (PSP)180 mW(WLAN Associated)<br>• Idle mode50 mW(WLAN unassociated) |

Not all configuration components are available in all regions/countries.
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## Technical Specifications

- Connected Standby 10mW
- Radio disabled8 mW

| | |
|---|---|
| **Power Management** | ACPI and PCI Express compliant power management<br>802.11 compliant power saving mode |
| **Receiver Sensitivity[3]** | 802.11b, 1Mbps: -93.5dBm maximum<br>802.11b, 11Mbps: -84dBm maximum<br>802.11a/g, 6Mbps: -86dBm maximum<br>802.11a/g, 54Mbps: -72dBm maximum<br>802.11n, MCS07: -67dBm maximum<br>802.11n, MCS15: -64dBm maximum<br>802.11ac, MCS0: -84dBm maximum<br>802.11ac, MCS9: -59dBm maximum |
| **Antenna type** | High efficiency antenna.<br>One embedded dual band 2.4/5 GHz antenna is provided to the card to support WLAN communications |
| **Form Factor** | PCI-Express M.2 MiniCard |
| **Dimensions** | Type 2230: 2.3 x 22.0 x 30.0 mm |
| **Weight** | Type 2230: 2.8g |
| **Operating Voltage** | 3.3v +/- 9% |
| **Temperature** | Operating 14° to 158° F (−10° to 70° C)<br>Non-operating −40° to 176° F (−40° to 80° C) |
| **Humidity** | Operating 10% to 90% (non-condensing)<br>Non-operating 5% to 95% (non-condensing) |
| **Altitude** | Operating 0 to 10,000 ft (3,048 m)<br>Non-operating 0 to 50,000 ft (15,240 m) |
| **LED Activity** | LED Amber – Radio OFF; LED White – Radio ON |

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Not all configuration components are available in all regions/countries.
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## Technical Specifications

### POWER

| | |
|---|---|
| **Efficiency** | 65W EPS, 89% average efficiency at 115V & 230Vac (Level VI) |
| **Operating Voltage Range** | 90Vac~264Vac |
| **Rated Voltage Range** | 100Vac~240Vac |
| **Rated Line Frequency** | 50HZ~60HZ |
| **Operating Line Frequency** | 47HZ~63HZ |
| **Rated Input Current** | 65W≦1.6A |
| **Rated Input Current with Energy Efficient\* Power Supply** | 65W≦1.6A |
| **DC Output** | +19.5V |
| **Current Leakage (NFPA 99: 2102)** | Less than 500 microamps of leakage current at 120 Vac with the ground wire disconnected, as required for Non-Patient Electrical Appliances and Equipment used in a patient care facility or that contact patients in normal use. Per section 10.3.5.1.<br>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. |
| **External Power Adapter** | External power supply |
| **Dimensions** | 65W: 113.5mm x 55mm x 30mm |

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## Technical Specifications

### ENVIRONMENTAL & INDUSTRY

**Eco-Label Certifications & declarations**

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:
- IT ECO declaration
- US ENERGY STAR®
- EPEAT®: Gold registered in the United States. See http://www.epeat.net for registration status in your country. Search keyword *generator* on HP's 3rd party option store for solar energy accessory at http://www.hp.com/go/options.
- TCO Certified Edge

**System Configuration**

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

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

| | 115VAC, 60Hz | 230VAC, 50Hz | 100VAC, 50Hz |
|---|---|---|---|
| Normal Operation (Short idle) | 19.076 | 19.109 | 18.911 |
| Normal Operation (Long idle) | 7.123 | 7.146 | 7.074 |
| Sleep | 0.468 | 0.503 | 0.46 |
| Off | 0.302 | 0.348 | 0.292 |

**NOTE:** Energy efficiency data listed is for an ENERGY STAR® certified 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® certified 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. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options

| **Heat Dissipation*** | 115VAC, 60Hz | 230VAC, 50Hz | 100VAC, 50Hz |
|---|---|---|---|
| Normal Operation (Short idle) | 65.04916 | 65.16169 | 64.48651 |
| Normal Operation (Long idle) | 24.28943 | 24.36786 | 24.12234 |
| Sleep | 1.59588 | 1.71523 | 1.5686 |
| Off | 1.02982 | 1.18668 | 0.99572 |

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

| **Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)** | Sound Power ($L_{WAd}$, bels) | Sound Pressure ($L_{pAm}$, decibels) |
|---|---|---|
| Typically Configured – Idle | 2.3 | 3.2 |
| Fixed Disk – Random writes | 2.3 | 3.3 |

**Longevity and Upgrading**

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

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

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## Technical Specifications

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

Batteries used in the product do not contain:
- Mercury greater the1ppm by weight
- Cadmium greater than 20ppm by weight

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

**Additional Information**

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT®) standard at the Gold level, see http://www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 38.3% post-consumer recycled plastic (by wt.)
- This product is 95.8% recycle-able when properly disposed of at end of life.

**Packaging Materials**

| **External:** | PAPER/Corrugated | 1369 |
|---|---|---|
| **Internal:** | PLASTIC/EPS (Expanded Polyethylene) | 349 |
| | PLASTIC/Polyethylene low density | 50 |

The plastic packaging material contains at least 100% recycled content.

The corrugated paper packaging materials contains at least 80% recycled content.

**Material Usage**

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

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

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**Packaging Usage**

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

**End-of-life Management and Recycling**

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

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

**HP, Inc. Corporate Environmental Information**

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

Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Eco-label certifications
http://www8.hp.com/us/en/hp-information/environment/ecolabels.html
ISO 14001 certifications:
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842
and
http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

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## Technical Specifications

### Summary of Changes

| Date of change: | Version History: | | Description of change: |
|---|---|---|---|
| | V1 to V2 | | |
| | | | |
| | | | |

Not all configuration components are available in all regions/countries.
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