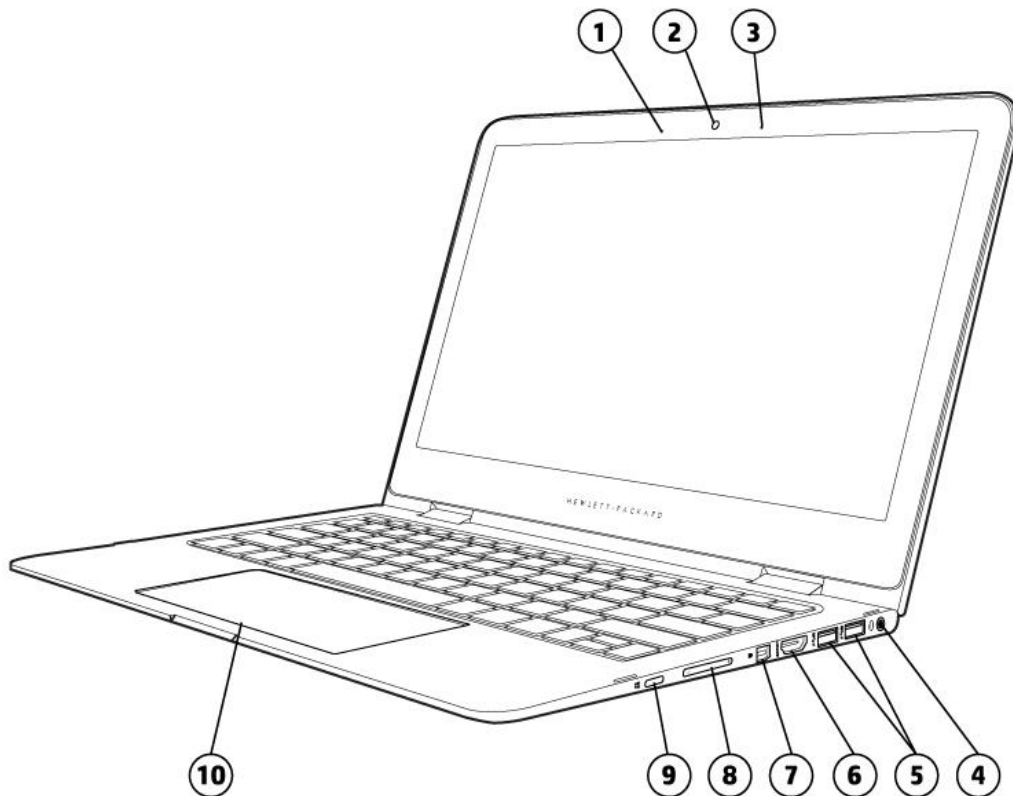


Overview

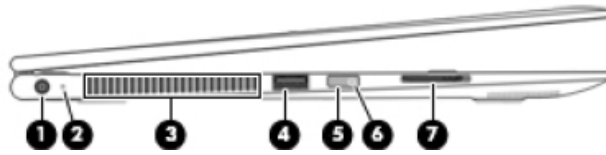
HP Spectre Pro x360 Convertible PC



Front side RIGHT view

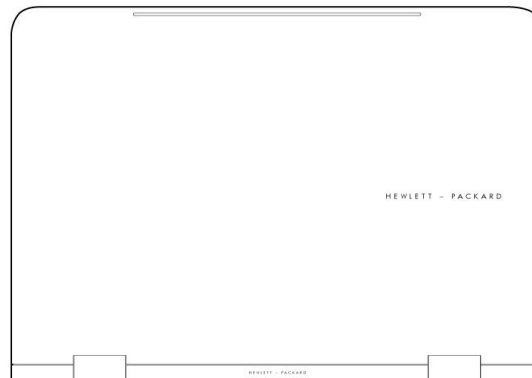
- | | |
|---|---------------------|
| 1. WLAN antennas | 6. HDMI Port |
| 2. Webcam LED | 7. Mini DisplayPort |
| 3. Dual-microphone array | 8. Volume button |
| 4. Audio-out (headphone)/Audio-in (microphone) jack | 9. Windows button |
| 5. USB 3.0 charging ports | 10. TouchPad |

Overview



Left view

- | | |
|-----------------------------|-----------------------|
| 1. Power Connector | 5. Power button |
| 2. AC adapter/battery light | 6. Power light |
| 3. Vent | 7. Memory Card reader |
| 4. USB 3.0 Port | |



Rear view

Overview

At A Glance

- Innovative x360 hinge - Unique geared hinges offer flexible positioning for work, entertainment, or sharing content
- 13.3-inch diagonal Touchscreen, Multitouch enabled and Active Stylus writing support
- Full-size island style keyboard with Dura-coat
- Touchpad w/ multi-touch gesture support image sensor
- A cool 15.9 mm thin design
- Weight starting at 3.17 lbs (1.44 kg)
- Choose from versions of Windows 10, Windows 8.1 or Windows 7
- 5th Generation Intel® Core™ i7 or i5 Processors with Turbo Boost and optional vPro Technology
- Integrated Intel® HD 5500 Graphics
- Choice of Solid State Drives – MLC or TLC, SED support, up to 512 GB
- Wireless connectivity:
 - Intel® 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.0 Combo
 - Intel® 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo
- HP Long Life 3-cell, 56 WHr Li-ion battery
- Battery life up to 12 hours 30 minutes (Windows 8.1)
- Security includes TPM 1.2 Embedded Security Chip, Microsoft Security Essentials (Windows 7 only), and Microsoft Defender (Windows 8.1 only)
- Standard commercial 1 year warranty, upgrade available to 3 year with the purchase of optional HP Care Pack

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

Features

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64¹
Windows 8.1 Pro 64¹
Windows 8.1 Pro for Education 64¹
Windows 8.1 64¹
Windows 8.1 CH (CPPP) 64¹
Windows 8.1 EM 64¹
Windows 8.1 ML 64¹
Windows 8.1 High-end ML 64¹
Windows 8.1 High-end EM 64¹
Windows 7 Professional 64¹

Web-only Support

Windows 10 Pro 64¹
Windows 10 Home 64¹
Windows 10 Enterprise 64¹
Windows 8 64¹
Windows 8 Professional 64¹
Windows 8 Chinese Market 64¹
Windows 8 Emerging Markets 64¹
Windows 8 Multi-Language 64¹
Windows 8 Professional 64¹
Windows 7 Enterprise 64¹
Windows 7 Enterprise 32¹
Windows 7 Professional 32¹

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. See <http://www.microsoft.com>.

PROCESSOR

Intel® Core™ i7-5600U with Intel HD Graphics 5500
(2.6 GHz, up to 3.2 GHz with Intel Turbo Boost Technology, 4 MB cache, 2 cores)^{1,2}
Intel® Core™ i5-5300U with Intel HD Graphics 5500
(2.3 GHz, up to 2.9 GHz with Intel Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2}
Intel® Core™ i5-5200U with Intel HD Graphics 5500
(2.2 GHz, up to 2.7 GHz with Intel Turbo Boost Technology, 3 MB cache, 2 cores)^{1,2,3}

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. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering 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 <http://www.intel.com/technology/turboboost> for more information.
3. Not available with Intel iAMT. Does not support vPro.

Features

CHIPSET

Chipset integrated with processor

GRAPHICS

Intel® HD* Graphics 5500

DISPLAY

13.3-inch diagonal FHD UWVA WLED BrightView (1920 x 1080) eDP 1.2¹
13.3-inch diagonal QHD UWVA WLED BrightView (2560 x 1440) eDP1.3+PSR¹

- Flush glass design
- Touchscreen, Multitouch enabled and Active Stylus writing support

1. HD content required to view HD images.

External

Up to 32-bit per pixel color depth

HDMI

v1.4b Supporting up to 1920x1200 @ 60Hz

NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.

STORAGE AND DRIVES

Internal Storage Device

Solid State Drives

128 GB SSD 2280 DS TLC / SATA
256 GB SSD 2280 DS TLC / SATA
256 GB SSD 2280 DS MLC / SATA-3 Self-Encrypting Drive
512 GB SSD 2280 DS TLC / SATA
128 GB SSD 2280 DS MLC / SATA-3
512 GB SSD 2280 DS MLC / SATA-3

NOTE:

For storage, GB = 1 billion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 8.1) is reserved for system recovery software.

MEMORY

Standard

LPDDR3-1600 (Transfer rates up to 1600 MT/s)
Dual Channel Support
Memory soldered down

Supports

4096 MB (128Mx2x32 x 4PCs) - 1600 MT/s¹
8192 MB (256Mx4x16 x 4PCs) - 1600 MT/s¹

Features

Maximum

8 GB

1. Memory soldered down. Internal component upgrades to memory are not available after factory configuration.

NETWORKING/COMMUNICATIONS

Wireless LAN (WLAN)¹

Intel® 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.0 Combo

Intel® 802.11a/b/g/n (2x2) and Bluetooth® 4.0 Combo

1. 802.11 wireless is an optional add-on feature and requires wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.

Communications

Miracast support

AUDIO/MULTIMEDIA

Audio

I2S/I2C Audio for Windows 8.1

HD Audio for Windows 7

Premium Audio

Dual Speakers

Webcam

HP TrueVision Full HD* camera

Fixed (no tilt) + activity LED

1 Piece

USB 3.0

M-JPEG

Wide FOV(88 degree)

1920 x 1080 by 30 frames per second

Dual array Digital Microphones

With appropriate software - beam forming, echo cancellation, noise suppression

*HD content required to view HD images.

KEYBOARDS/POINTING DEVICES/BUTTONS

Full-size island style keyboard

Backlit island-style Keyboard (Dura-coat, Silver color)

Pointing Device

Touchpad with image sensors

Multitouch gestures enabled

Support Win8 Modern Trackpad Gestures

Taps enabled as default

Features

Chassis Buttons

Power
Volume Up/Down
MS Start
LED Indicators

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

HP Value Add Software

HP Touchpoint Manager¹
HP Wireless Hotspot²
HP Support Assistant
HP ePrint³

Multimedia

Cyberlink PowerDVD/Power Media Player 12

Collaboration

Skype RTC Insertion⁴
mysms-Metro (Windows 8.1 only)

Third Party

Buy Office
Adobe® Shockwave Player
Foxit PhantomPDF Express for HP

Photos and Videos

Intel® Wireless Display (WiDi)⁵
Intel® WiDi Pro
Cyberlink Youcam (Windows 7 only)
HP PageLift

Security

Microsoft Security Essentials (Windows 7 only)⁶
Microsoft Defender (Windows 8.1 only)⁷
MS BitLocker
Intel® Anti-Theft-p Ready support
HP SmartPass support
TPM 1.2

1. HP Touchpoint Manager supports Android™, iOS and Windows operating systems and PCs, notebooks, tablets and smartphones from various manufacturers. Not available in all countries see www.hp.com/touchpoint for availability information. Touchpoint Manager require purchase of a subscription. Out-of-band HP only Wipe, Lock, Unlock and reporting of BIOS boot error codes is planned to be available on select HP EliteBooks and tablets and requires Intel® vPro™ technology and functions in S3/Sleep, S4/Hibernate and S5/Soft Off power states.
2. The HP Wireless Hotspot application requires an active internet connection and separately purchased data plan. While HP wireless hotspot is active, on-device applications will continue to work and will use the same data plan as the wireless hotspot. Wireless hotspot data usage may incur additional charges. Check with your service provider for plan details. Requires Windows 8.1 or HP Connection Manager for Windows 7.
3. Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/businessmobileprinting).
4. Skype is not offered in China.

Features

5. Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, TV or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, TV or computer monitor via a standard HDMI cable, also sold separately.
6. Requires Windows 7. Opt in and internet connection required for updates.
7. Requires Windows 8. Opt in and internet connection required for updates.

POWER

Power Supply

HP 45W Smart AC Adapter
HP 45W Smart AC 2-prong Adapter (Japan only)
HP 65W EM Smart AC Adapter (India only)

5.90 feet (1.8 m) length AC and DC power cords

Battery

HP Long Life 3-cell, 56 WHr Li-ion

Battery Life

Up to 12 hours 30 minutes¹

1. Windows 8 MM12 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Weight

Starting at 3.17 lbs (1.44 kg)
(QHD Display + 3 cell battery + single mSATA)

Starting at 3.26 lbs (1.48 kg)
(FHD Display+ 3 cell battery + single mSATA)

Dimensions (w x d x h)

12.79 x 8.58 x .61 in
325 x 218 x 15.4 mm (Front)

NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components.

PORTS/SLOTS

- 3 USB 3.0 Ports (2 at left; 1 at right)
- 1 mini DisplayPort 1.2
- 1 HDMI (Cable not included)
- 1 Headphone output & Microphone input combo jack
- 1 AC power adapter plug

EXPANSION SLOTS

Features

HP Multi-Format Digital Media Card Reader
Support SD/SDHC/SDXC
Push-Push Insertion/Removal

INTERNAL CARD EXPANSION

One NGFF Slot (2230) for WLAN
One NGFF Slot (2280) for SSD

COUNTRY OF ORIGIN

China

ENVIRONMENTAL

TBD

SERVICE AND SUPPORT

HP Services offers a 1-year limited warranty option depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>. *Sold separately or as an optional feature.

** Service levels and response times for HP Care Services 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

Technical Specifications

System Unit

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5 V
	Average Operating Power	31.54 W
	Max Operating Power	45W
Temperature	Operating	32° to 95° F (0° to 35° C) 41° to 95° F (5° to 35° C)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C)
Shock	Operating	40 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
Random Vibration	Operating	0.75 grms
	Non-operating	1.50 grms
Altitude (unpressurized)	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
Planned Industry Standard Certifications	UL	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR®	Yes
	EPEAT	Gold for US; others for Silver
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KC	No
	BSMI	No
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

NOTE:
Configurations of the HP Spectre Pro x360 Convertible PC that are ENERGY STAR qualified are identified as HP Spectre Pro x360 Convertible PC ENERGY STAR on HP websites and on www.energystar.gov.
EPEAT registration varies by country. See www.epeat.net for registration status by country.
EPEAT status listed above applies to U.S.

For accessibility information on HP products, please visit: <http://www.hp.com/accessibility>.

Technical Specifications

DISPLAYS

13.3-inch diagonal FHD UWVA WLED BrightView (1920 x 1080) eDP 1.2	Outline Dimensions (W x H x D)	305.65mm x 188.32mm x 2.85mm (Max; w/o bracket)	
	Active Area	293.86mm x 165.34mm	
	Weight	260g	
	Diagonal Size	13.3 inch	
	Touch enabled	Yes	
	Contrast Ratio	800 typ.	
	Refresh Rate	60Hz	
	Brightness	350nits typ. (w/o touch)	
	Pixel Resolution	Format	FHD
		Configuration	1920 x 1080
	Interface	eDP	
	LCD Mode	LED	
	PPI	166	
	Viewing Angle	85/85/85/85	

13.3-inch diagonal QHD UWVA WLED BrightView (2560 x 1440) eDP1.3+PSR1	Outline Dimensions (W x H x D)	306.8mm x 189.2mm x 2.6mm (Max; w/o bracket)	
	Active Area	293.376mm x 165.024mm	
	Weight	235g	
	Diagonal Size	13.3 inch	
	Touch enabled	Yes	
	Contrast Ratio	700 typ.	
	Refresh Rate	60Hz	
	Brightness	340nits typ. (w/o touch)	
	Pixel Resolution	Format	QHD
		Configuration	2560 x 1440
	Interface	eDP	
	LCD Mode	LED	
	PPI	221	
	Viewing Angle	85/85/85/85	

NETWORKING/COMMUNICATIONS

Intel® 802.11 2x2ac + Bluetooth 4.0 Combo

Wireless LAN Standards	IEEE 802.11a
	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n
	IEEE 802.11ac

Technical Specifications

Interoperability Frequency Band

Wi-Fi certified
802.11b/g/n

- 2.402 – 2.482 GHz

Note:

The FCC has declared as of January 1, 2015 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

802.11a

- 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

Note:

Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)

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, and 80MHz)

Modulation

Direct Sequence Spread Spectrum

BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM

Security¹

- IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only
- AES-CCMP: 128 bit in hardware
- 802.1x authentication
- WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
- WPA2 certification
- IEEE 802.11i
- Cisco Certified Extensions, all versions through CCX4 and CCX Lite
- WAPI

Network Architecture Models Roaming Output Power²

Ad-hoc (Peer to Peer)

Infrastructure (Access Point Required)

IEEE 802.11 compliant roaming between access points

- 802.11b : +16dBm minimum
- 802.11g : +14dBm minimum
- 802.11a : +14dBm minimum
- 802.11n HT20(2.4GHz) : +13dBm minimum
- 802.11n HT40(2.4GHz) : +13dBm minimum
- 802.11n HT20(5GHz) : +12dBm minimum

Technical Specifications

	<ul style="list-style-type: none"> 802.11n HT40(5GHz) : +12dBm minimum 802.11ac 80MHz(5GHz) : +11dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW
Power Management	ACPI and PCI Express compliant power management
Receiver Sensitivity³	802.11 compliant power saving mode 802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
Weight	Type 2230 : 2.8g Or Type 1630 : 2g
Operating Voltage	3.3v +/- 9%
Temperature	Operating 14° to 158° F (-10° to 70° C) Non-operating -40° to 176° F (-40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON
	<ol style="list-style-type: none"> Check latest software/driver release for updates on supported security features. Maximum output power may vary by country according to local regulations. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology	
Bluetooth Specification	4.0+EDR Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
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.

Technical Specifications

Receiver Sensitivity

Modulation	0.01% BER	0.001% BER
GFSK	-80 dBm	-70 dBm
$\pi/4$ -DQPSK	-80 dBm	-70 dBm
8DPSK	-80 dBm	-70 dBm

Power Consumption

Peak (Tx) 330 mW
 Peak (Rx) 230 mW
 Selective Suspend 17 mW

Range

Up to 33 ft (10 m)

Electrical Interface

USB 2.0 compliant

Bluetooth Software Supported Link Topology

Microsoft Windows Bluetooth Software

Electrical Interface

Point to Point, Multipoint Pico Nets up to 7 slaves

Bluetooth Software Supported Security

Full support of Bluetooth Security Provisions

Power Management

Microsoft Windows ACPI, and USB Bus Support

Power Management

Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff

Certifications

All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249

Security

Certifications

Bluetooth Profiles Supported

Power Management

Certifications

ETS 300 328, ETS 300 826
 Low Voltage Directive IEC950
 UL, CSA, and CE Mark
 Serial Port Profile (SPP)¹
 Service Discovery Application Profile (SDAP)
 Dial-Up Networking (DUN)^{1,2}
 Generic Object Exchange Profile (GOEP)^{1,2}
 Object Push Profile (OPP)^{1,2}
 File Transfer Profile (FTP)
 Synchronization Profile (SYNC)
 Hard Copy Cable Replacement (HCRP)^{1,2}
 Personal Area Networking Profile (PAN)^{1,2}
 Human Interface Device Profile (HID)^{1,2}
 FAX Profile (FAX)
 Basic Imaging Profile (BIP)²
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

Certifications

Bluetooth Profiles Supported

Intel® 802.11 2x2 a/b/g/n + Bluetooth 4.0 Combo

Wireless LAN Standards

IEEE 802.11b
 IEEE 802.11g
 IEEE 802.11n

Interoperability

Wi-Fi certified

Frequency Band

802.11b/g/n
 • 2.402 – 2.482 GHz

Note:

The FCC has declared as of January 1, 2015 products that utilize passive

Technical Specifications

	scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
Antenna Structure	2 transmit; 2 receive (2x2)
Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM
Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between band Access Points
Output Power²	<ul style="list-style-type: none"> • 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11n HT20(2.4GHz) : +13dBm minimum • 802.11n HT40(2.4GHz) : +13dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 60 mW (WLAN unassociated) Radio disabled: 30 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity⁴	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -86dBm maximum 802.11a, 54Mbps : -72dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm 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 and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm

Technical Specifications

Weight	Type 2230 : 2.8g Or Type 1630 : 2g	
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	

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. In Power Save Polling mode and on battery power.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

Bluetooth Specification	4.0+EDR Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
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.

Receiver Sensitivity			
	Modulation	0.01% BER	0.001% BER
	GFSK	-80 dBm	-70 dBm
	$\pi/4$ -DQPSK	-80 dBm	-70 dBm
	8DPSK	-80 dBm	-70 dBm

Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported Link Topology	Microsoft Windows Bluetooth Software
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves
Bluetooth Software Supported Security	Full support of Bluetooth Security Provisions
Power Management	Microsoft Windows ACPI, and USB Bus Support
Power Management Certifications	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Security Certifications	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Bluetooth Profiles Supported	
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950

Technical Specifications

Certifications Bluetooth Profiles Supported

UL, CSA, and CE Mark
 Serial Port Profile (SPP)¹
 Service Discovery Application Profile (SDAP)
 Dial-Up Networking (DUN)^{1,2}
 Generic Object Exchange Profile (GOEP)^{1,2}
 Object Push Profile (OPP)^{1,2}
 File Transfer Profile (FTP)
 Synchronization Profile (SYNC)
 Hard Copy Cable Replacement (HCRP)^{1,2}
 Personal Area Networking Profile (PAN)^{1,2}
 Human Interface Device Profile (HID)^{1,2}
 FAX Profile (FAX)
 Basic Imaging Profile (BIP)²
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

AUDIO/MULTIMEDIA

Hardware	Implementation	I2S /HD Audio
	Function Key Volume Controls	up, down and mute function keys
	Full Duplex	yes
	Microphone In	stereo (combo jack)
	Headphone/Line Out	stereo (combo jack)
	Integrated Microphone	yes
Audio Output Quality	Frequency Response	20~22kHz
	Signal to Noise Ratio	102 dB FSA (DAC)
	Total Harmonic Distortion	-88 dB FSA (DAC)
	Noise Floor	
	Play/Record Sampling Rate(s)	support 44.1k/48k/96k/192kHz sample rate
		DAC
	ADC	24bits
Internal Stereo Speaker	Power Rating	2W
	Impedance	4 ohm

POWER

Technical Specifications

HP 45W Smart AC Adapter

Dimensions	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)	
Weight	0.386 lb (175g) max	
	90 to 265 VAC	
Input	Input Efficiency	87.74% at 115Vac and 88.4% at 230Vac
	Input frequency range	47 to 63 Hz
	Input AC current	1.4 A at 90 VAC
	Output power	45W
	DC output	19.5V
Output	Hold-up time	5 msec at 115 VAC input
	Output current limit	<8.0A
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
Connector	3 pin/grounded, mates with interchangeable cords	
	Operating temperature	32° to 95° F (0° to 35° C)
	Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
Environmental Design	Altitude	0 to 16,400 ft (0 to 5,000 m)
	Humidity	20% to 95%
	Storage Humidity	10% to 95%
EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.	

HP 65W EM Smart AC Adapter

Dimensions	4.98 x 1.97 x 1.18 in (12.65 x 5.0 x 3.0 cm)	
Weight	0.62 lb (290g) max	
	90 to 265 VAC	
Input	Input Efficiency	87% min at 115 VAC
	Input frequency range	47 to 63 Hz
	Input AC current	1.7 A at 90 VAC
	Output power	65W
	DC output	19.5V
Output	Hold-up time	5 msec at 115 VAC input
	Output current limit	<11.0A
	Over voltage protection	< 29V max automatic shutdown
	Over short protection	Auto-recovery and no damage
Connector	3 pin/grounded, mates with interchangeable cords	
Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)

Technical Specifications

Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
Altitude	0 to 16,400 ft (0 to 5,000 m)
Humidity	20% to 95%
Storage Humidity	10% to 95%

EMI and Safety Certifications

CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.

HP Long Life 3-cell, 56 WHr Li-ion

Dimensions (H x W x L)	5.60*146.80*291.80
Weight	230g
Cells/Type	3-cells/Lithium-Ion Polymer
	11.4v
Energy	4.96Ah
	56Wh
	Operating (Charging) 32° to 113° F (0° to 45° C)
Temperature	Operating (Discharging) 14° to 122° F (-10° to 60° C)
	Non-operating -4° to 122° F (-20° to 60° C)
Battery	
Re-Charge Time	<3 hours
Fuel Gauge LED	No
Warranty	1000 cycles

Options and Accessories (sold separately and availability may vary by country)

Type	Description	Part #
Carrying Cases	HP Executive Leather Messenger	K0A31AA
	HP Business Slim Top Load	H5M91AA
	HP Slim Ultrabook Messenger	F3W14AA
	HP Slim Ultrabook Top Load	F3W15AA
Docking	HP Adjustable Display Stand	AW663AA#xxx
	HP USB 3.0 Port Replicator	H1L08AA#xxx
Input/Output	HP 3001pr USB 3 Port Replicator	F3S42AA
	HP Wireless Mobile Mouse	H2L63AA
	HP 3-button USB Laser Mouse	H4B81AA
	HP X4000b Bluetooth Mouse	H3T50AA#xxx
	HP USB Travel Mouse	G1K28AA
	HP Stylish Wireless KB/Mouse	H4B79AA
	Pen	K8P73AA
	HDMI to VGA Adapter	H4F02AA
	HP HDMI to DVI Adapter	F5A28AA
	HP 45W Smart AC Adapter (4.5mm) (PL MP only)	H6Y88AA#xxx
Adapters	HP 65W Smart AC Adapter (4.5mm)	H6Y89AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP EliteDisplay S231d 23-inch LEB Backlit Monitor	F3J72AA
Monitors	HP EliteDisplay S240ml 23.8-inch MHL Monitor	F4M47AA
	HP S140u 14-inch USB Monitor	G8R65AA/T

Summary of Changes

Date of change	Version History		Description of change
March 3, 2015	V1 to V2	Added	256 GB SSD 2280 DS MLC / SATA-3 SED
March 5, 2015	V2 to V3	Updated	Memory DDRL units from Mhz to MT/s on page 5
March 19, 2015	V3 to V4	Updated	Added Pro in name Added Web support operating systems Updated storage section Updated memory section Updated weight Updated Audio Updated battery times
March 19, 2015		Added	Detailed specs for Display page 10 Detailed specs for Audio/Media page 16 Detailed specs for Power/Battery page 17
March 24, 2015	V4 to V5	Updated	Updated overview with 3 year warranty option page 3 Updated battery life page 3 and 8 Removed Windows 8.1 Single Language page 4 Added Detailed specs for the System Unit page 10 HP 45W Smart AC Adapter page 18 HP 65W EM Smart AC Adapter page 18 and 19
June 11, 2015	V5 to V6	Added	Windows 8 Professional 64 under Web only support
July 22, 2015	V6 to V7	Updated	Overview with Windows 10 page 3 and OS section with Windows 10 page 4
July 31, 2015	V7 to V8	Updated	OS section with additional Windows 8 and Windows 8.1 page 4
November 10, 2015	V8 to V9	Added	Added Pen page 21
March 16, 2016	V9 to V10	Updated	Software section

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