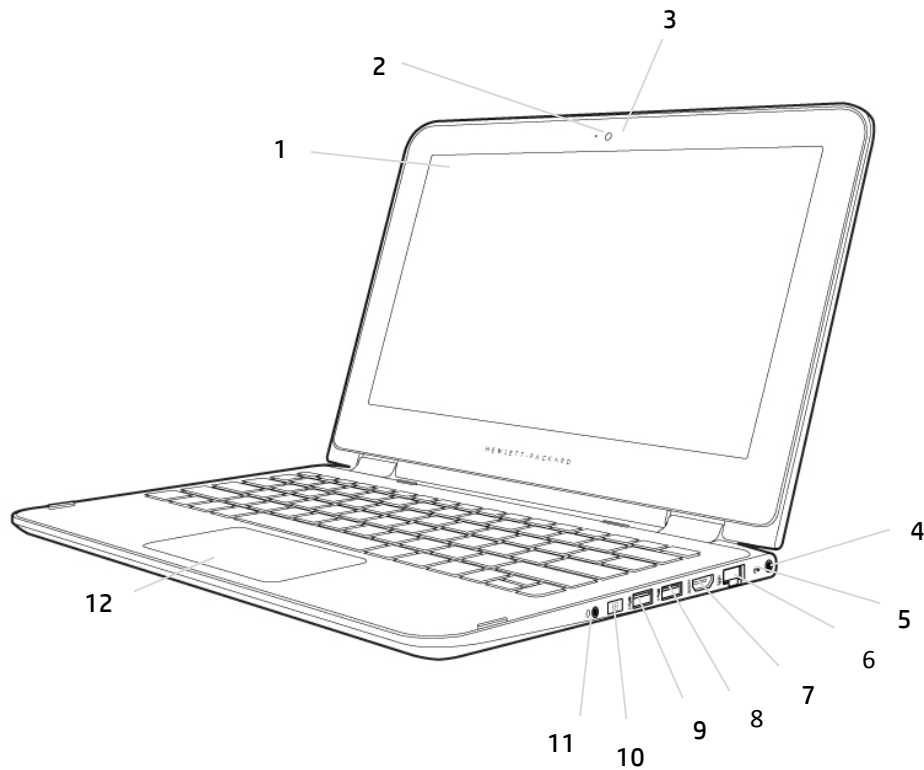


Overview

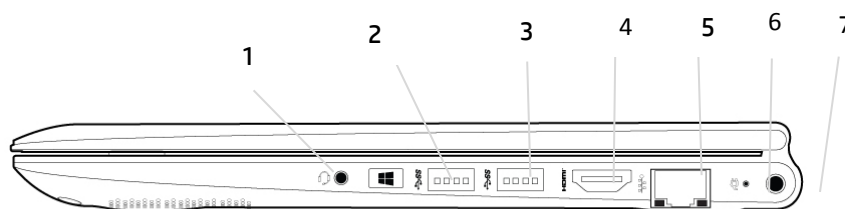
HP x360 310 G2 PC



Front Side

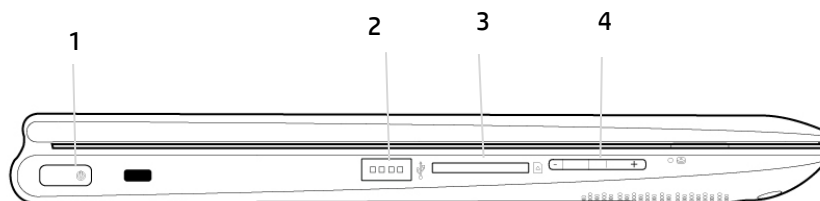
- | | | | |
|----|-------------------------------------|-----|--------------------------------------|
| 1. | 11.6" Diagonal Touch Screen Display | 7. | HDMI |
| 2. | Webcam LED | 8. | USB Port 3.0 |
| 3. | Webcam | 9. | USB Port 3.0 |
| 4. | Power Connector | 10. | Windows logo |
| 5. | Power Connector LED | 11. | Headphone / Microphone in Combo Jack |
| 6. | RJ-45 | 12. | Clickpad |

Overview



Left

- | | | | |
|----|--------------------------|----|---------------------|
| 1. | Headphone/Mic Combo Jack | 5. | RJ-45 |
| 2. | USB Port 3.0 | 6. | Power Connector LED |
| 3. | USB Port 3.0 | 7. | Power Connector |
| 4. | HDMI | | |



Right

- | | | | |
|----|--------------|----|---|
| 1. | Lock Slot | 3. | HP Multi-Format Digital Media Card Reader |
| 2. | USB Port 2.0 | 4. | Volume Control |

Overview

AT A GLANCE

- Windows 10 editions or Windows 8.1 editions
- Choose from Intel® Pentium® or Intel® Celeron® processors
- Intel® HD Graphics
- 11.6" diagonal HD IPS UWVA WLED anti-glare slim (1366 x 768) Touch Screen
- Storage options up to 256 Solid State Drives
- Memory options up to 8 GB
- Full size textured island keyboard
- HDMI port for connecting to high-resolution displays
- HP TrueVision HD Webcam (front-facing) with integrated dual array digital microphones
- Supports a broad range of wireless options
- Weight starting at 3.27 lbs. (1.48 kg)
- Dual Speakers for optimized for high fidelity audio
- Passed MIL STD testing¹

1. MIL STD 810G testing is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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



Features

PRODUCT NAME

HP x360 310 G2 PC

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64¹
Windows 8.1 Pro 64¹
Windows 8.1 SST 64¹
Windows 8.1 Core for Higher Education (ML) 64¹
Windows 8.1 Pro StF MSNA¹
Windows 8.1 Pro StF MSNA EM¹

Web only supported

Windows 8.1 64¹
Windows 10 Home 64¹
Windows 10 Pro 64¹
Windows 10 Enterprise 64¹

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

PROCESSORS

Intel® Pentium® N3700 with Intel® HD Graphics (1.66 GHz, up to 2.4 GHz, 2 MB cache, 4 cores)¹
Intel® Celeron® N3050 with Intel® HD Graphics (1.6 GHz, up to 2.16 GHz, 2 MB cache, 2 cores)¹

1. Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 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.

CHIPSET

Integrated with processor

GRAPHICS

Intel® HD Graphics



Features

DISPLAY

Internal

11.6" diagonal HD¹ IPS UWVA WLED anti-glare slim (1366 x 768) Touch Screen

- Touch solution with flush glass
- Multitouch enabled

External

Up to 32-bit per pixel color depth

HDMI²

1.4b port supports up to 2560x1600 @ 60Hz

1. HD content required to view HD images.
2. HDMI cable sold separately.

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

STORAGE AND DRIVES

Primary Storage Bay

Hard Drives

500 GB 5400rpm 7.2mm Hard Drive (ONLY available with 2-cell battery)

Single Solid State Drive configurations (TLC):

64 GB M.2 SATA Solid State Drive

128 GB M.2 SATA Solid State Drive

256 GB M.2 SATA Solid State Drive

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

MEMORY

Standard

One SODIM slot (customer non-accessible)

Single Channel Support

DDR3L-1600 (Transfer rates up to 1600 MT/s)

4 GB (4 GB x 1)

8 GB (8 GB x 1)

Maximum

8 GB

NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.



Features

NETWORKING/COMMUNICATIONS

Wireless

Realtek 802.11b/g/n (1x1) WiFi and Bluetooth® 4.0 Combo^{1,2}

Intel® Dual Band Wireless-AC 3165 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo^{1,2}

Intel® Dual Band Wireless-AC 7265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.0 Combo^{1,2}

1. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.
2. Sold separately or as an optional feature.

Intel® WiDi5.1 support

Compatible with Miracast-certified devices

Communications

Integrated Ethernet 10/100/1000 (Gigabit) NIC

AUDIO/MULTIMEDIA

Audio

Bang & Olufsen audio

Dual speakers

Headphone / Microphone in Combo Jack

Dual digital microphone

Webcam¹

HP TrueVision HD² camera

- Fixed (no tilt) + activity LED
- 1280 x 720 by 30 frames per second
- Dual array Digital Microphones w/ appropriate software - beam forming, echo cancellation, noise suppression

1. Internet access required.
2. HD content required to view HD images.

KEYBOARDS/POINTING DEVICES

Keyboard

Full-sized textured Ash Silver island-style keyboard

Clickpad

Multitouch gestures enabled

Support Win8 Modern Trackpad Gestures

Taps enabled as default

Stylus writing support



Features

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

Buy Office

HP Touchpoint Manager¹

HP ePrint²

HP Wireless Hotspot³

Adobe® Shockwave Player

HP SchoolPack (Only supported in Windows 10)

Security

Security lock slot (Lock sold separately.)

TPM 2.0 Embedded Security Chip

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 requires 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 requires an Internet connection, Intel® vPro™ technology and functions in S3/Sleep, S4/Hibernate and S5/Soft Off power states. SATA drives are wiped. The remote wipe of Self Encrypting Drives that have hardware encryption active is not supported.
2. 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 www.hp.com/go/businessmobileprinting).
3. The 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 plan for details.

POWER

Power Supply

HP 45 W Smart AC Adapter

Primary Battery

HP 2-cell battery - 32 WHr Li-ion

HP 3-cell battery - 48Whr Li-ion

Supports battery fast charge

Length power cord 1 meter or 1.8 meter

Battery life

TBD

System Standby Time

TBD

WEIGHTS & DIMENSIONS

Weight

Starting at 3.27 lbs. (1.48 kg)

Dimensions (w x d x h)

12.05 x 8.19 x 0.89 in



Features

30.6 x 20.8 x 2.25 cm

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

PORTS/SLOTS

Ports

2 USB 3.0
1 USB 2.0
1 HDMI
1 RJ-45
1 AC power

HP Multi-Format Digital Media Reader

Support SD/SDHC/SDXC
Push-Push Insertion/Removal

Note: All cables are sold separately.

SERVICE AND SUPPORT

HP 1 year limited warranty. 1 year limited warranty on primary battery. On-site service and optional extended service contracts are also available. Optional¹ HP Services² are extended service contracts which go beyond your standard limited warranties. For more details visit: <http://www.hp.com/go/lookuptool>.

1. Sold separately or as an optional feature.
2. 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. 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. 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>.



Technical Specifications

NETWORKING/COMMUNICATIONS

Realtek 802.11b/g/n (1x1) WiFi and Bluetooth® 4.0 Combo

Wireless LAN Standards	<p>IEEE 802.11b IEEE 802.11g IEEE 802.11n</p>
Interoperability	Wi-Fi certified
Frequency Band	<p>802.11b/g/n</p> <ul style="list-style-type: none"> • 2.402 – 2.482 GHz <p>Note: The FCC has declared as of September 1, 2014 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.</p>
Data Rates	<p>802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: MCS 0 ~ MCS 07, (20MHz)</p>
Modulation	<p>Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,</p>
Security¹	<ul style="list-style-type: none"> • IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • WAPI
Network Architecture Models	<p>Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)</p>
Roaming	IEEE 802.11 compliant roaming between 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 • 802.11n HT20(5GHz) : +12dBm minimum



Technical Specifications

	<ul style="list-style-type: none">802.11n HT40(5GHz) : +12dBm 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 Sensitivity³	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm 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 antennas for 2.4GHz are provided to the card to support WLAN and Bluetooth communications. (Support Dual antenna or Single antenna, depend on platform requirement)
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%



Technical Specifications

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+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		



Technical Specifications

Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves
Bluetooth Software Supported	Full support of Bluetooth Security Provisions
Security	
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	
Security	All necessary regulatory approvals for supported countries, including:
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Bluetooth Profiles Supported	
Power Management	ETS 300 328, ETS 300 826
Certifications	Low Voltage Directive IEC950 UL, CSA, and CE Mark
Certifications	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)



Technical Specifications

Intel® Dual Band Wireless-AC 3165 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.0 Combo

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n <ul style="list-style-type: none">• 2.402 – 2.482 GHz Note: <p>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.</p> 802.11a/n <ul style="list-style-type: none">• 4.9 – 4.95 GHz (Japan)• 5.15 – 5.25 GHz• 5.25 – 5.35 GHz• 5.47 – 5.725 GHz• 5.825 – 5.850 GHz Note: <p>Indonesia only supports 5.725 - 5.825 GHz (CH149 - CH161)</p>
Data Rates	<ul style="list-style-type: none">• 802.11b: 1, 2, 5.5, 11 Mbps• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)• 802.11ac: MCS0 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-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



Technical Specifications

	<ul style="list-style-type: none">• 802.1x authentication• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.• WPA2 certification• IEEE 802.11i• Cisco Certified Extensions, all versions through CCX4 and CCX Lite• WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	<ul style="list-style-type: none">• 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• 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 802.11 compliant power saving mode
Receiver Sensitivity³	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



Technical Specifications

	802.11n, MCS15 : -66dBm maximum
	802.11ac, 1SS, MCS-0 : -86dBm maximum
	802.11ac, 1SS, MCS-9 : -61 dBm 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

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

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology



Technical Specifications

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	Microsoft Windows Bluetooth Software		
Link Topology			
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves		
Bluetooth Software Supported	Full support of Bluetooth Security Provisions		
Security			
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			



Technical Specifications

Security	All necessary regulatory approvals for supported countries, including:
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Bluetooth Profiles Supported	
Power Management	ETS 300 328, ETS 300 826
Certifications	Low Voltage Directive IEC950 UL, CSA, and CE Mark
Certifications	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)
Bluetooth Profiles Supported	

Intel® Dual Band Wireless-AC 7265 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.0 Combo

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac
Interoperability	Wi-Fi certified
Frequency Band	802.11b/g/n



Technical Specifications

- 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

Ad-hoc (Peer to Peer)
Infrastructure (Access Point Required)

Roaming

IEEE 802.11 compliant roaming between access points

Output Power²

- 802.11b : +16dBm minimum
- 802.11g : +14dBm minimum



Technical Specifications

	<ul style="list-style-type: none">• 802.11a : +14dBm minimum• 802.11n HT20(2.4GHz) : +13dBm minimum• 802.11n HT40(2.4GHz) : +13dBm minimum• 802.11n HT20(5GHz) : +12dBm minimum• 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 802.11 compliant power saving mode
Receiver Sensitivity³	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 : -61 dBm 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



Technical Specifications

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	

4. Check latest software/driver release for updates on supported security features.
5. Maximum output power may vary by country according to local regulations.
6. 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	Microsoft Windows Bluetooth Software		
Link Topology			
Electrical Interface	Point to Point, Multipoint Pico Nets up to 7 slaves		
Bluetooth Software Supported	Full support of Bluetooth Security Provisions		
Security			
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			
Security	All necessary regulatory approvals for supported countries, including:		
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249		
Bluetooth Profiles Supported			
Power Management	ETS 300 328, ETS 300 826		
Certifications	Low Voltage Directive IEC950		
Certifications	UL, CSA, and CE Mark		
Bluetooth Profiles Supported	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}		



Technical Specifications

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)

**HP 3-cell battery
 48 Whr Li-ion**

Dimensions
Weight
Cells/Type

W 39.68 x L 214.56 x H 21.19 (± 0.2mm)
 TBD
 3-cell Lithium-Ion

ENVIRONMENTAL

**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.

**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)	7.17 W	7.08 W	7.08 W
Normal Operation (Long idle)	4.16 W	4.54 W	4.29 W
Sleep	0.42 W	0.63 W	0.42 W
Off	0.40 W	0.58 W	0.39 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



Technical Specifications

U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 60Hz
Normal Operation (Short idle)	25 BTU/hr	24 BTU/hr	24 BTU/hr
Normal Operation (Long idle)	14 BTU/hr	16 BTU/hr	15 BTU/hr
Sleep	1 BTU/hr	2 BTU/hr	1 BTU/hr
Off	1 BTU/hr	2 BTU/hr	1 BTU/hr

*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	2.8	22
Fixed Disk – Random writes	2.7	21

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:

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD

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

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

Batteries used in the product do not contain:
 Mercury greater the 1ppm by weight
 Cadmium greater than 20ppm by weight

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



Technical Specifications

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 contains 0% post-consumer recycled plastic (by wt.)
- This product is 97% recycle-able when properly disposed of at end of life.

Packaging Materials	External:	PAPER/Corrugated	329.5 g
	Internal:	PLASTIC/Polyethylene low density	14.5 g
		PLASTIC/EPE-Expanded Polyethylene	38 g
		PLASTIC/Polypropylene	3.2 g

The plastic packaging material contains at least 30% recycled content.

The corrugated paper packaging materials contains at least 30% recycled content.

Material Usage

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

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



Technical Specifications

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

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

**Hewlett-Packard
Corporate
Environmental
Information**

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

Global Citizenship Report

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

Eco-label certifications

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

ISO 14001 certificates:

http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf

and

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

COUNTRY OF ORIGIN

China



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

Type	Description	Part number
Case	HP Essential Top Load Case (up to 15.6")	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Slim Ultrabook Messenger	F3W14AA
	HP Slim Ultrabook Top Load	F3W15AA
	HP Slim Ultrabook Backpack	F3W16AA
Docking	HP 3001pr USB 3 Port Replicator	F3S42AA
	HP Universal Port Replicator	E6D70AA
Input/Output	USB Stylish Keyboard & Mouse Bundle	H4B80AA
	Conferencing Keyboard	K8P74AA
	HP 3-Button Laser Mouse	H4B81AA
	HP Wireless Optical Mouse LTNA	K7S53AA#ABM
	HP 2.4GHz Wireless Mouse	LOZ84AA
	Wireless keyboard and mouse	G1K29AA
	HP Speaker Phone	K7V16AA
	HP Wired Headset	K7V17AA
	HP External USB Optical Drive	F2B56AA
	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
Adapters	65W Smart AC Adapter	H6Y89AA
	HP UltraSlim Keyed Cable Lock	H4D73AA
Security	20 Notebook Managed Charging Cart	QL489AA
	20 Notebook Charging Cart	QL488AA
	30 Notebook Managed Charging Cart	QL490AA
Health Care/ Education	30 Notebook Charging Cart	H4F31AA
	HP ProDisplay P242va 24-inch LED Backlit Monitor	K7X32AA
Displays	HP EliteDisplay S270c 27-inch Curved Monitor	K1M38AA
	HP S140u 14-inch USB Monitor	G8R65AA/T



Summary of Changes

Date of change	Version History	Description of change
June 25, 2015	Version 1 to 2	Added Bang & Olufsen audio, 64 & 500 SSD, Ash silver color to keyboard. Removed spill resistant from keyboard
July 31, 2015	V2 to v3	Updated Operating systems with Windows 10 page 3 and other Windows 8.1 page 4
February 19, 2016	V3 to v4	Passed MIL STD testing and footnote page 3 Added HP Touchpoint Manager; HP ePrint; HP Wireless Hotspot; Adobe® Shockwave Player, and HP School Pack and footnotes page 7
July 25, 2016	V4 to v5	Environmental updates

Copyright © 2016 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Intel, Core, Pentium and Celeron are registered trademarks or trademarks of Intel Corporation in the U.S. and/or other countries. Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. ENERGY STAR is a registered trademark mark owned by the U.S. Environmental Protection Agency. Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation.

