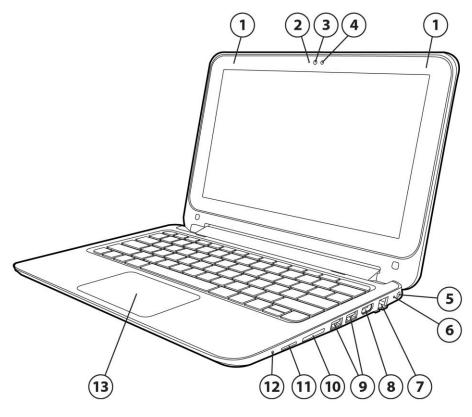
HP x360 310 G1 PC

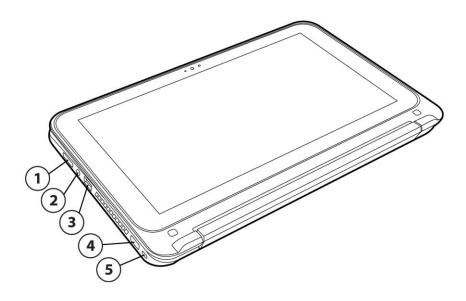


Front,

- WLAN antennas
 Microphone
- 3. HD Webcam
- 4. Webcam LED
- 5. Power connector
- 6. AC Adapter/battery light
- 7. Ethernet port (RJ-45)

Front, Right

- 8. HDMI v1.4 port
- 9. USB 3.0 port (closest to HDMI port) and USB 2.0 port
- 10. Media card reader
- 11. WWAN SIM tray (WWAN configs only)
- 12. HDD activity LED
- 13. Clickpad



1. Volume + / - button

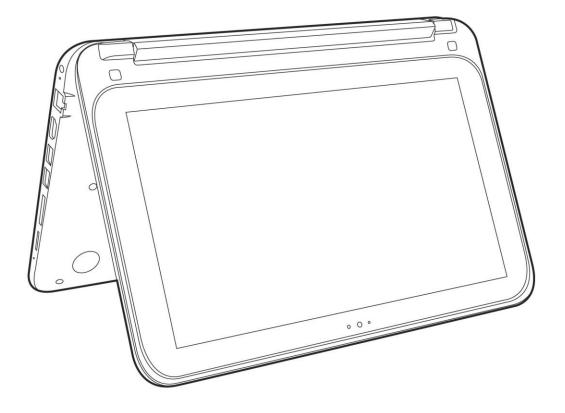
- 2. Combo headphone / mic jack
- 3. USB 2.0 port

Tablet

- 4. Power button
- 5. Security lock slot



Open View



Up View

At A Glance

- 360 Convertible PC combines a super sleek design with key business features and the ability to seamlessly transition between notebook or tablet with one device.
- Windows 8.1 Pro 64 or Windows 8.1 SST 64
- Intel[®] Pentium[™] N3520 processor or Intel Celeron[™] N2820 processor
- Integrated Intel HD Graphics
- 11.6" diagonal HD WLED (1366 x 768) Touchscreen
- Choice of 5400 rpm hard drive (up to 750 GB) or 500 GB Solid State Hybrid drive
- 0.86 inch (21.9 mm) thin profile
- Weight of clamshell starting at 3.08 lbs (1.4 kg)
- HP Beats Audio with integrated stereo speakers, integrated microphone, front facing HP HD Webcam
- 97% scale backlit island-style keyboard
- · Easily hot dock with one of the optional HP port replicators
- 2-cell (29 WHr) prismatic battery
- Clickpad w/ multi-touch gesture support image sensor
- · Security features including a security lock slot and TPM Embedded Security Chip
- · Wireless connectivity:
 - HP hs3210 HSPA+ Mobile Broadband Module
 - o Ralink 802.11 b/g/n (1x1) Bluetooth® 4.0 Combo
 - Qualcomm 802.11b/g/n (1x1) and Bluetooth 4.0 Combo
 - o Realtek 802.11 b/g/n (1x1)
 - o Atheros 802.11 b/g/n (1x1)
- Standard commercial 1 year warranty with upgrade available with HP Care Pack

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



PRODUCT NAME

HP x360 310 G1 PC

OPERATING SYSTEM

Preinstalled Windows 8.1 Pro 64*

Windows 8.1 SST 64* Office Trial 2013**

* Not all features are available in all editions of Windows 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 functionality. See http://www.microsoft.com/

**Select Windows SST systems include Office Home & Student 2013 with full versions of Word, Excel, PowerPoint and One Note and is not available in all regions. Office Home & Student 2013 edition software may not be used for commercial, non-profit or revenue-generating activities.

PROCESSOR*

Intel® Pentium® N3520 (2.17 GHz, 2 MB L2 cache, 4 cores)* Intel® Celeron® N2820 (1.86 GHz, 1 MB L2 cache, 2 cores)*

* 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 SoC PCH

GRAPHICS

Integrated:

Intel HD Graphics

• Supports HD playback, streaming, and recording @ 720p 30fps

DISPLAY

Internal

11.6" diagonal HD* WLED (1366 x 768) SVA Touchscreen

- Standard viewing angle flat panel (3.6 mm)
- Support LVDS (co-layout with eDP1.3+PSR)
- Touchscreen, Multi-touch enabled

Externa

Up to 32-bit per pixel color depth

VGA

Port supports resolutions up to 1920x1200 external resolution @ 60 Hz

HDMI*

1.4 port supports up to 1080p, 1920x1080 at 60Hz

* HD content required to view HD images.

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

STORAGE AND DRIVES



Hard Drives

320/500/750 GB 5400 rpm SMART SATA II (7 mm, 7.2 mm for the 750 GB drive)

Hybrid Drives

500 GB SATA Solid State Hybrid Drive

NOTE: For hard drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

MEMORY

DDR3L SDRAM 1600 MHz downgraded to 1333 MHz (Pentium) or 1066MHz (Celeron)

1 SODIMM slot On-board

Standard memory up to 8192 MB

NETWORKING/COMMUNICATIONS

Wireless

Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries as a standard, factory configurable feature only. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.

Broadband Wireless (WWAN)

HP hs3210 HSPA+ Mobile Broadband Module*

Wireless LAN (WLAN)

Ralink 802.11 b/g/n (1x1) Bluetooth® 4.0 Combo* Qualcomm 802.11b/g/n (1x1) and Bluetooth 4.0 Combo* Realtek 802.11 b/g/n (1x1)*

Atheros 802.11 b/g/n (1x1)*

* Wireless access point and internet service required and sold separately. Availability of public wireless access points limited.

AUDIO/MULTIMEDIA

Audio

HP Beats Audio™

Dual speakers (front facing)

Single digital microphone with echo cancellation, noise suppression

Formats: MP3, AAC, AAC+, EAAC+ OGG, MIDI

Headphone/Line-out (Beats supported) and Mic-in (combo)

Webcams (Front)

Integrated HP HD* Webcam**

- HD* format
- 720p
- 2.0MP
- Supports videoconferencing and still image capture
- · High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

^{**} Internet access required.



^{*}HD content required to view HD images.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

97% scale backlit island-style keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, and function keys. US and International key layouts are available.

Pointing Devices

Clickpad with image sensor

Touchpad Requirements: Multi-touch gestures enabled, taps enabled as default, and multi-touch capacitive panel

Buttons

Power, Volume Up, Volume Down, Windows Start/Home

Sensors

Sensor Hub (Accelerometer + Gyroscope + e-Compass), supports Proximity Sensor for SAR certification (WWAN option)

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

Browser and Toolbars

Internet Explorer 10

UI Enhancements

HP Utility Center

Baidu Chinese IME (China only)

Productivity

Buy Office

QuickBooks 30-day Trial (NA only)

7-Zip

E-readers and Document Viewers

Kindle

Windows Essentials

MovieMaker Photo Gallery

SkyDrive

Photos and Videos

Cyberlink YouCam DE (Windows 8.1 only)

SnapFish URLAdobe® Shockwave Player HP Connected Photo powered by Snapfish

Music - HP

HP Connected Music powered by Meridian* (includes UMG for Arabic and India) (NA only) Fingertapps Instruments

* Availability of features varies by country. Streaming services may require a paid subscription. May not be compatible with all music files. Not compatible with DRM tracks. Internet access is required and not included.

Movies

VUDU Movies (NA only) Netflix (NA and LA only)



Comment [SH1]: Software list is from x2 4 will need software list for this product.

Home AV integration / Home Networking

Intel WiDi*

* Integrated Intel Wi-Di feature is available on select configurations only (not included on the Ralink WLAN) 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.

Multimedia Codecs

Dolby MPEG2

Audio Post processing

Beats Audio™

Games - Microsoft

Solitaire Collection (NA only)

Games - HP

Classic Board Games ArcSoft Family Paint

Communication

Skype

Pinger (NA and LA only)

App Stores and Content Purchasing

eBay (not available in China) BestBuy.com (NA only) Costco.com (NA only) Amazon (NA only)

Cloud Storage

Box.net*

HP File Viewer/Connected Drive (US only)

HP Utilities and Support

HP Documentation

Getting Started with Windows 8

HP Registration (Windows 8/8.1 only)

HP Recovery Manager

HP Support Assistant**

HP ePrint Driver**

HP PeakShift (Japan only)

*50 GB Box account available on new 2013 HP Business Desktops, Notebooks, and Tablets. Requires Box registration. Offer available to new Box users only. Offer subject to change without notice. Box app requires Windows 8 or 8.1

** Requires Windows and internet access.

*** Requires an Internet connection to HP web-enabled printer and HP ePrint account registration for details, see www.hpconnected.com.

Standard

McAfee LiveSafe subscription (30 Day Subscription)*

HP SimplePass

Security Lock Slot

TPM Embedded Security Chip

* Internet access required. First 30 days included. Subscription required for live updates afterwards.



Optional

Security Lock

For more information on HP security solutions refer to: http://www.hp.com/go/security.

POWER

Power Supply

External HP 45W Slim Smart AC Adapter*
External 65W EM Smart AC Adapter (PRC, India only)
Power cord included is 3.3-foot (1.0 meter)
*AC adapter uses a 90 degree 4.5mm DC plug

Primary Battery

HP 2-cell prismatic (29 WHr)

Battery Life

HP 2-cell prismatic (29 WHr)

Up to TBD Hours

System Standby Time

Up to TBD hours

ENVIRONMENTAL

Low halogen*
RFID support
WEEE compliant (Waste Electric and Electronic Equipment)
ROHS 2 Compliant
MSH/OBL compliant
E-Standby compliant
DLNA certification
Anti-theft**
California Battery Charger Energy Efficiency compliant
Skype Acceptance Test
China CEL label

- * External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.
- * Intel AT security requires a separately purchased Absolute Computrace service subscription and must be activated and configured. Check with Absolute for availability in your country. Intel and HP assume no liability for lost or stolen data and/or systems or any other damages resulting therefrom. See http://www.intel.com/technology/anti-theft/

NOTE: 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.

WEIGHTS & DIMENSIONS

Weigh

Starting at 3.08 lbs (1.4 kg) (weight will vary by configuration)

Dimensions (w x d x h)

12.13 x 8.47 x 0.86 in (308 x 215.1 x 21.9 mm)

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

PORTS/SLOTS



Ports

USB 3.0 - One (right) USB 2.0 - Two (one right, one left) HDMI v1.4 – One VGA - One Stereo headphone-out/mic-in combo jack - One RJ-45 (Ethernet) - One AC adapter Smart Pin plug (4.5mm barrel) - One

Expansion Slots

HP Multi-Format Digital Media Card Reader Supports SD/SDHC/SDXC

SERVICE AND SUPPORT

HP Services offers a 1 year standard commercial warranty; 1 year limited warranty on primary battery. On-site service and optional* HP Care Pack Services** are available to extend your protection beyond the standard warranty. For more details visit: http://www.hp.com/go/cpc.



^{*}Sold separately or as an optional feature.

** 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. Consult the HP Customer Support Center for details. http://www.hp.com/go/cpc.

SYSTEM UNIT

Stand-Alone Power Requirements (AC

Nominal Operating Voltage

19.5 V

Power)

Average Operating

TBD W

Power

Max Operating Power < 45 W

Temperature Operating

32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)

-4° to 140° F (-20° to 60° C) Non-operating

Relative Humidity Operating 10% to 90%, non-condensing

Non-operating 5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature

> Operating 40 G, 2 ms, half-sine Non-operating 200 G, 2 ms, half-sine

Random Vibration Operating 0.75 grms

Japan VCCI

GOST

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)

> > Yes

Yes

Planned Industry Standard Certifications

Shock

CSA Yes **FCC Compliance** Yes

ENERGY STAR® TBD models* TBD** **EPEAT ICES** Yes Australia / **NZ A-Tick Compliance** Yes

Compliance KC Yes **BSMI** Yes **CE Marking** Yes Compliance **BNCI or BELUS** Yes CIT Yes

Saudi Arabian Yes Compliance (ICCP) **SABS** Yes

UKRSERTCOMPUTER Yes

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



^{*} Configurations of the HP x360 310 G1 PC that are ENERGY STAR qualified are identified as HP x360 310 G1 PC on HP websites and on www.energystar.gov.

^{**} EPEAT® registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country.

DISPLAYS

11.6-inch diagonal WLED HD (1366 x 768)

Active Area 9.88 x 5.67 in (25.61 x 14.40 cm) Dimensions (W x H) 11.53 x 6.49 in (29.3 x 16.5 cm)

Diagonal Size 11.6 in (29.46 cm) **Contrast Ratio** 300:1 (typical) Refresh Rate 60 Hz

Brightness 200 nit (typical)

Backlight

Pixel Resolution Format 1366 x 768 **RGB Stripe**

Configuration

Viewing Angle 40/40/15/30 (Left/Right/Down/Up) (typical)

STORAGE AND DRIVES I don't see the 500GB hybrid drive here

750 GB* 5400 rpm **SATA Hard Drive**

Drive Weight 0.22 lb (101 g) Capacity 750 GB

Height 0.37 in (9.5 mm) Width 2.75 in (70 mm)

Interface ATA-8, SATA 2.6, 3.0 Gb/s, NCQ

Transfer Rate Synchronous 300 MB/s (Drive Capability)

(maximum)

Seek Time Single Track 3 ms (typical reads, including Average 13 ms settling) 24 ms Maximum

Rotational Speed 5400 rpm Logical Blocks 1,465,149,168

Operating Temperature 32° to 140° F (0° to 60° C) [case temp]

Features **ATA Security**

500 GB* 5400 rpm **SATA Hard Drive**

Drive Weight 0.22 lb (101 g) Capacity 500 GB Height 0.37 in (9.5 mm) Width 2.75 in (70 mm)

Interface ATA-8, SATA 2.6, 3.0 Gb/s, NCQ

Transfer Rate Synchronous 150 MB/s (Drive Capability)

(maximum)

Seek Time Single Track 3 ms (typical reads, including 13 ms **Average** settling) Maximum 24 ms

Rotational Speed 5400 rpm Logical Blocks 976,773,168

Operating Temperature 32° to 140° F (0° to 60° C) [case temp]

Features ATA Security

320 GB* 5400 rpm SATA Hard Drive

 Drive Weight
 0.22 lb (101 g)

 Capacity
 320 GB

 Height
 0.37 in (9.5 mm)

 Width
 2.75 in (70 mm)

Interface ATA-8, SATA 2.6, 3.0 Gb/s, NCQ

Transfer Rate Synchronous (maximum) 150 MB/s (Drive Capability)

 Seek Time
 Single Track
 3 ms

 (typical reads, including settling)
 Average
 13 ms

 Maximum
 24 ms

Rotational Speed 5400 rpm **Logical Blocks** 625,142,448

Operating Temperature 32° to 140° F (0° to 60° C) [case temp]

Features ATA Security

NETWORKING/COMMUNICATIONS

Integrated Realtek 10/100/1000 NIC

(/1000 to be confirmed)

Ethernet Features

10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses

13-14)

100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3

clauses 21-30)

1000 Mbit/s operation (100BASE-T; IEEE 802.3ab; IEEE 802.3

clauses 21-30) (Support in RTL8161FH-CG only) Auto-Negotiation (Automatic Speed Selection)

Full Duplex Operation at all Speeds, Half Duplex operation at 10

and 100 Mbit/s

IEEE 802.1p QoS (Quality of Service) Support

IEEE 802.1q VLAN support

IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable

Power Management ACPI compliant - multiple power modes

Situation-sensitive features reduce power consumption

Advanced link down power saving for reducing link down power

consumption

Performance Features TCP/IP/UDP Checksum Offload (configurable)

Large send offload and Giant send offload

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)

PXE 2.1 Remote Boot

Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB

(802.3x, clause 30))

Comprehensive diagnostic and configuration software suite

Virtual Cable Doctor for Ethernet cable status

Interface PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ

^{*} For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

Comment [SH2]: Will need to verify these

Technical Specifications

NIC Device Driver Name Realtek PCIe FE Ethernet Family Controller

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HP hs3210 HSPA+ **Mobile Broadband** Module *

Technology/Operating CDMA/1xRTT/EvDO: 800MHz (Cell), 1900MHz (PCS)

GSM/GPRS/EDGE: 850MHz (Cell), 900MHz (EGSM), 1800MHz

(DCS), 1900MHz (PCS)

UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), 900MHz (UTRA FDD Band VIII), 850

MHz (UTRA FDD Band V) LTE: 700 MHz (Verizon, Band XIII)

Mobile Operator

Wireless Protocol Standards

Verizon (US only) GSM/GPRS/EDGE: Class B, Multi-slot class 10 operation, coding

schemes CS1 - CS4 and MSC1 - MSC9.

CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-856,

UMTS/WCDMA: Release 99 and Release 7 LTE: Power Class III as per 3GPP TS 36.101

Wireless Parametric

Standards

Complies with 3GPP specifications Release 8 for LTE

Maximum Data Rates EvDO (Revision A) - 3.1 Mbps (Download), 1.8 Mbps (Upload)

WCDMA (DC-HSPA+) - 42Mbps (Download)

LTE (Category 3) - 100 Mbps (Download), 50Mbps (Upload)

GPS Standalone, Assisted, XTRA **GPS Bands** 1575.42 MHz (± 1.023 MHz)

Maximum Output Power

GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+0.7/-2.3) LTE: +23 dBm (+2.7 dBm/-1.7 dBm) 1xRTT/EvDO: +24 dBm (+0.5 dBm/-1.5 dBm)

Maximum Power Consumption

2700mA (peak)

Power Consumption,

Sleep Mode

10 mA

Power Management

USB selective suspend

Integrated notebook wireless button

Antenna Type Dual high efficiency 6 band antennae with spatial diversity, mounted in

the display enclosure

Form Factor PCI-Express MiniCard, USB 2.0 interface Weight

Dimensions (Length x Width x Thickness)

2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)

Voltage, Operating

3.3v +/- 9%

Temperature. Operating (from -4° to 149° F (-20° to 65° C)

TIA/EIA/IS-98-D) Temperature, Nonoperating, 96 hours

-40° to 185° F (-40° to 85° C)

(from MIL-STD 202 Method 108) **Humidity, Non-**

85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)

operating **LED Activity**

LED Off - Radio Off;

Solid LED On - Radio On

* Mobile Broadband is an optional feature sold separately or as an add on feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors.

Atheros 802.11b/g/n WiFi Adapter*, **
 Wireless LAN
 IEEE 802.11b

 Standards
 IEEE 802.11g

 IEEE 802.11n

Interoperability Wi-Fi certified

Cisco Compatible Extensions Program compliant with Microsoft Win7,

(details at: http://www.hp.com/go/notebooks/WLAN)

Frequency Band 2.402 - 2.482 GHz

Data Rates 802.11b: 1, 2, 5.5, 11 Mbps

802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11n150Mbps for MCS7

Frequency Support

20 MHz: 2.4 GHz bands

Modulation

Direct Sequence Spread Spectrum

DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM

Security¹

Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC,

PEAP-MSCHAPv2, LEAP, EAP-FAST.

Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows 7only.

Sub-channels Multinational support with frequency bands and channels compliant to

local regulations.

Media Access Protocol CSMA/CA (Collision Avoidance) with ACK

Network Architecture

Ad-hoc (Peer to Peer)

Models

Infrastructure (Access Point Required)

Roaming IEEE 802.11 compliant roaming between access points

Output Power² 13.5 dBm, minimum

Power Consumption Idle associated: 250 mW avg (CLKREQ enabled)

Idle unassociated: 100 mW avg Transmit/Receive channel: 2.0 /1.6 W

Power Management ACPI compliant power management

802.11 compliant power saving mode

Receiver Sensitivity³ 11b:-88dBm@11Mbps,

11g:-74 dBm@54Mbps, 11n:-70dBm@72.Mbps.

Antenna type High efficiency dual antenna with spatial diversity, usually mounted in

the display enclosure

Form Factor PCI-Express Half-MiniCard

Weight 4 g

Dimensions 3.3 x 26.65 x 29.85 mm

Operating Voltage 3.3v +/- 9%

Temperature Operating -10° to 70° C

Non-operating -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)

Amber LED on-Radio OFF; White LED on-Radio ON

LED Activity

Amber LED on-Radio OFF; White LED on-Radio ON

Check latest software/driver release for updates on supported security features.

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 (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

NOTE: 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 and Win7.

Qualcomm 802.11b/g/n Wireless LAN

Bluetooth 4.0 Combo Card*

Wireless LAN IEEE 802.11b Standards IEEE 802.11g

IEEE 802.11n

Interoperability Wi-Fi certified

Cisco Compatible Extensions Program compliant with Microsoft

Windows7 (details at: http://www.hp.com/go/notebooks/WLAN)

Frequency Band 2.402 - 2.482 GHz

Data Rates 802.11b: 1, 2, 5.5, 11 Mbps

802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11n: 150Mbps for MCS7

Modulation Direct Sequence Spread Spectrum

DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM

Security¹ Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated

AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC,

PEAP-MSCHAPv2, LEAP, EAP-FAST. WAPI

Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows Vista and XP

only.

Sub-channels Multinational support with frequency bands and channels compliant to

local regulations.

Media Access Protocol CSMA/CA (Collision Avoidance) with ACK

Network Architecture Ad-hoc (Peer to Peer)

Models Infrastructure (Access Point Required)

Roaming IEEE 802.11 compliant roaming between access points

Output Power

(for CCK)²

13.5dBm, minimum

Power Consumption Idle associated: 250 mW

Idle unassociated: 150 mW Transmit: 2.0 W (max)

^{*} Wireless access point and internet service required. Availability of public wireless access points limited.

^{**} Sold separately or as an optional add-on feature.

Receive: 2.0 W (max)

Power Management ACPI compliant power management

802.11 compliant power saving mode

11b:-88dBm@11Mbps, Receiver Sensitivity³

11g:-74 dBm@54Mbps. 11n:-70dBm@72.Mbps.

High efficiency dual antenna with spatial diversity, mounted in the Antenna type

display enclosure

Form Factor PCI-Express Half-MiniCard v1.2

Weight

Dimensions 3.3 x 26.65 x 29.85 mm

Operating Voltage 3.3v +/- 10%

Temperature Operating 14° to 149° F (-10° to 65° C)

-40° to 176° F (-40° to 80° C) Non-operating

Humidity Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)

0 to 10,000 ft (3,048 m) Operating

Altitude Non-operating 0 to 50,000 ft (15,240 m)

LED Off - Radio OFF; Solid LED On - RadioON

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 (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

NOTE: 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 and Windows 7.

Bluetooth Specification

V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0

Number of Available

Channels

LED Activity

79 (1 MHz) available channels

Data Rates and 3 Mbps data rate; throughput up to 2.17 Mbps

Throughput 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 -6 dBm to 4 dBm (Bluetooth Class II)

Receiver Sensitivity Better than -80 dBM at 0.1 % raw bit error rate

Power Consumption Peak (Tx) 330 mW

Peak (Rx) 230 mW Sleep <17 mW

Antenna Internally integrated within module

Range Up to 33 ft (10 m) **Electrical Interface** USB 2.0 compliant

Microsoft Windows Plug and Play compliant

Bluetooth Software Supported

Broadcom Bluetooth for Windows Microsoft Windows Bluetooth Software

Link Topology

Point to Point, Multipoint Pico Nets up to 7 slaves

Full support of Bluetooth Security Provisions Security

Power Management Microsoft Windows ACPI, and USB Bus Support

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

ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark

Bluetooth Profiles

Supported

Generic Access Profile (GAP)

Service Discovery Application Profile (SDAP)

Serial Port Profile (SPP)

Dial_Up Networking Profile (DUN) Generic Object Exchange Profile (GOEP)

Object Push Profile (OPP) File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) Personal Area Networking Profile (PAN) Human Interface Device Profile (HID)

Generic Audio/Video Distribution Profile (GAVDP) Advanced Audio/Video Distribution Profile (A2DP)

FAX Profile (FAX)

Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Basic Printing Profile (BPP) VDP (Video Distribution Profile)

AVRCP (Audio Video Remote Control Profile)

Realtek RTL8188EE 802.11 b/g/n (1x1)

Wireless LAN IEEE 802.11b **Standards** IEEE 802.11g IEEE 802.11n Wi-Fi certified Interoperability Frequency Band 2.402 - 2.482 GHz **Data Rates**

802.11b: 1, 2, 5.5, 11 Mbps

802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11n: card will support rates for NSS=1 for RX and TX for 20 MHz

channels. Short and long guard interval will be supported.

Modulation Direct Sequence Spread Spectrum

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

Security¹ IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode

AES-CCMP: 128 bit in hardware 802.1x authentication types WPA,

WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.

WPA2 certification IEEE 802.11i

Cisco Certified Extensions, all versions through V5

WAPI

Network Architecture

Ad-hoc (Peer to Peer)

Models Infrastructure (Access Point Required)

^{*} Wireless access point and internet service required. Availability of public wireless access points limited.

<sup>.
**</sup> Sold separately or as an optional add-on feature.

Roaming IEEE 802.11 compliant roaming between access points

Output2 13.5 dBm, nominal

Power Consumption Transmit: 2.0 W (max)

Receive: 1.6 W (max)

Associated to Access Point, Idle: 250 mW nominal

Wireless Button Off: 100 mW nominal Radio disabled: 75 mW nominal

Power Management ACPI compliant power management 802.11 compliant power saving mode

Receiver Sensitivity³ 802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -

88 dBm (11 Mbps)

802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm

(48 Mbps), -74 dBm (54 Mbps)

802.11n:-70dBm (72.2 Mbps)

Antenna Connections High efficiency antenna with spatial diversity, mounted in the display

enclosure

Form Factor PCI-Express Half-MiniCard

Dimensions 0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)

Operating Voltage 3.3v +/- 9%

Humidity

Temperature Operating 14° to 158° F (-10° to 70° C)

Non-operating -40° to 176° F (-40° to 80° C)

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 Off - Radio OFF; Solid LED On - Radio ON

 ${\it 1. Check\ latest\ software/driver\ release\ for\ updates\ on\ supported\ security\ features.}$

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).

Ralink RT3290LE 802.11 b/g/n (1x1) Bluetooth 4.0 Combo *. ** Wireless LAN IEEE 802.11b Standards IEEE 802.11g

IEEE 802.11n Wi-Fi certified

Interoperability Wi-Fi certified

Cisco Compatible Extensions Program compliant with Microsoft Windows7

(details at: http://www.hp.com/go/notebooks/WLAN)

Frequency Band 2.402 – 2.482 GHz

Data Rates 802.11b: 1, 2, 5.5, 11 Mbps

802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11n: card will support rates for NSS=1 for RX and TX for 20 MHz

channels. Short and long guard intervals shall be supported

Modulation Direct Sequence Spread Spectrum

DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM

Security¹

Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-

MSCHAPv2, LEAP, EAP-FAST. WAPI

Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 5) with Microsoft Windows Vista and XP only.

Sub-channels Multinational support with frequency bands and channels compliant to local

regulations.

Media Access

CSMA/CA (Collision Avoidance) with ACK

Protocol

Network Ad-hoc (Peer to Peer)

Architecture Infrastructure (Access Point Required)

Models Roaming

IEEE 802.11 compliant roaming between access points

Output Power (for

CCK)²

13.5dBm, minimum

Power Idle associated: 250 mW
Consumption Idle unassociated: 150 mW

Transmit: 2.0 W (max) Receive: 2.0 W (max)

Power ACPI compliant power management 802.11 compliant power saving mode

Receiver 72.2 Mbps: -70 dBm; 54 Mbps: -74 dBm; 11 Mbps: -88 dBm; 1 Mbps: -95

Sensitivity³ dBm

Antenna type High efficiency dual antenna with spatial diversity, mounted in the display

enclosure

Form Factor PCI-Express Half-MiniCard

Weight 6 g

Humidity

Altitude

Dimensions 3.3 x 26.65 x 29.85 mm

Operating Voltage 3.3v +/- 10% Temperature Operating

Operating 14° to 149° F (-10° to 65° C) Non-operating -40° to 176° F (-40° to 80° C)

Operating -40° to 176° F (-40° to 80° C)

10% to 90% (non-condensing)

Non-operating 5% to 95% (non-condensing)

Operating 0 to 10,000 ft (3,048 m)

Non-operating 0 to 50,000 ft (15,240 m)

LED Activity LED Off – Radio OFF; Solid LED On – RadioON

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 (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

NOTE: 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 and Win7.



Bluetooth Specification

V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0

Number of 79 (1 MHz) available channels

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 -6 dBm to 4 dBm (Bluetooth Class II)

Receiver Sensitivity Better than -80 dBM at 0.1 % raw bit error rate

Power

Peak (Tx) 330 mW

Consumption Peak (Rx) 230 mW

Sleep <17 mW

Antenna Internally integrated within module

Range Up to 33 ft (10 m)
Electrical Interface USB 2.0 compliant

Microsoft Windows Plug and Play compliant

Bluetooth Software Broadcom Bluetooth for Windows Supported Microsoft Windows Bluetooth Software

Link Topology Point to Point, Multipoint Pico Nets up to 7 slaves

Security Full support of Bluetooth Security Provisions

Power Microsoft Windows ACPI, and USB Bus Support

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

ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark

Bluetooth Profiles

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Hard Copy Cable Replacement (HCRP)
Personal Area Networking Profile (PAN)
Human Interface Device Profile (HID)

Generic Audio/Video Distribution Profile (GAVDP) Advanced Audio/Video Distribution Profile (A2DP)

FAX Profile (FAX)
Basic Imaging Profile (BIP)
Headset Profile (HSP)
Hands Free Profile (HFP)
Basic Printing Profile (BPP)
VDP (Video Distribution Profile)

AVRCP (Audio Video Remote Control Profile)

- * Wireless access point and internet service required. Availability of public wireless access points limited.
- ** Sold separately or as an optional add-on feature.

AUDIO/MULTIMEDIA

Hardware Implementation IDT92HD99 High Definition CODEC Function Key Volume Volume up, volume down, and mute

Controls

Full Duplex Yes
Microphone In Stereo
Headphone/Line Out Stereo

Integrated Microphone Yes, dual digital microphone array

Audio Output Quality Frequency Response 20 Hz - 20 kHz

Signal to Noise Ratio >85 dB
Total Harmonic 0.01%

Distortion

Noise Floor -110 dB
Play/Record Sampling 8 kHz - 48kHz

Rate(s)

DAC 16, 20 or 24-bit
ADC 16 or 20-bit
Power Rating 2 Watts

Internal Stereo Speaker Power Rating 2 Watts Impedance 4 ohms

Power

HP 45W Smart AC Adapter

Dimensions 3.78 x 1.95 x 0.88 in (9.6 x 4.95 x 2.24 cm)

Input 90 to 265 VAC

Input Efficiency 87% min at 115 VAC

Input frequency range 47 to 63 Hz

Input AC current 1.4 A at 90 VAC and maximum load

Output Output power 45W

DC output 19.5V

Hold-up time 5 msec at 115 VAC input

Output current limit <8A, Over voltage protection- 29V max

automatic shutdown

Connector 3 pin/grounded, mates with interchangeable cords **Environmental Design Operating** 32° to 95° F (0° to 35° C)

temperature

Non-operating -4° to 121° F (-20° to 85° C)

(storage) temperature

Altitude 0 to 16,405 ft (0 to 5,000 m)

Humidity0% to 95%Storage Humidity0% 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; Reliability failure rate of less than 0.1% annually within the first three years of operation.

HP 65W Slim Smart AC Dimensions (H \times W \times

Adapter EM

126.0 x 50.0 x 30.0 mm

Input

90 to 265 VAC

Input Efficiency

87% min at 115 VAC/230VAC

Input frequency range 47 to 63 Hz

Input AC current

1.7 A at 90 VAC and maximum load

Output

Output power 65W DC output 19.5V

Hold-up time 5 msec at 115 VAC input

<11A, Over voltage protection- 29V max Output current limit

automatic shutdown

Connector **Environmental Design**

3 pin/grounded, mates with 7.4mm barrel type Smart ID DC connector

Operating

temperature

32° to 95° F (0° to 35° C)

Non-operating (storage) temperature

-4° to 121° F (-20° to 85° C)

Altitude 0 to 16,405 ft (0 to 5,000 m)

Humidity 0% to 95% **Storage Humidity** 0% 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; Reliability failure rate of less than 0.1% annually within the first three years of

operation.

COUNTRY OF ORIGIN

China



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

Туре	Description	Part #	
Cases	HP Slim Ultrabook Messenger (up to 15.6" x .88"/22/5mm)	F3W14AA	
	HP Slim Ultrabook Top Load (up to 15.6" x .88"/22/5mm)	F3W15AA	
	HP Slim Ultrabook Backpack (up to 15.6" x .88"/22/5mm)	F3W16AA	
Docking	HP Universal Port Replicator (in testing)	E6D70AA#xxx	
	HP 3001pr USB 3 Port Replicator	F3S42AA	
	HP Display and Notebook Stand II	E8G00AA#xxx	
	HP Dual Hinge II Notebook Stand	E8F99AA#xxx	
Input/Output	HP Touch To Pair Mouse	H6E52AA	
	HP Stylish Wireless KB/Mouse	H4B79AA	
	HP 2.4GHz Keyboard and Mouse (Dachshund)	G1K29AA	
	HDMI to VGA Adapter	H4F02AA	
	HP HDMI to DVI Adapter	F5A28AA	
Memory	HP 2GB DDR3L-1600 1.35V SODIMM	H6Y73AA#XXX	
	HP 4GB DDR3L-1600 1.35V SODIMM	H6Y75AA#XXX	
	HP 8GB DDR3L-1600 1.35V SODIMM	H6Y77AA#XXX	
Adapters	HP 65W Smart AC Adapter	ED494AA#xxx	
	HP 65W Smart AC Adapter (4.5mm)	H6Y89AA#xxx	
	HP 90W Smart AC Adapter	ED495AA#xxx	
	HP 90W Smart AC Adapter (4.5mm)	H6Y90AA#xxx	
Security	HP Keyed Cable Lock	BV411AA	
	HP UltraSlim Keyed Cable Lock	H4D73AA	
	HP USB Smart Card Reader	F6V67AA	
Storage - External Storage	HP External USB Optical Drive	F2B56AA	
Monitors	HP U160 15.6-inch LED Backlit Monitor	C4M77AA or D4T56AA#xxx (check region for which sku is available)	
	HP EliteDisplay E271i 27-inch IPS LED Monitor	D7Z72AA/A8/AS/AT	
	HP EliteDisplay E231 23-inch LED Monitor	C9V75AA/A8/AS/AT	
	HP EliteDisplay E201 20-inch LED Monitor	C9V73AA/A8/AS/AT	
	HP ProDisplay P221 21.5" LED Monitor	C9E49AA/A8/AS/AT	
	HP ProDisplay P201 20" LED Monitor	C9F26AA/A8/AS/AT	

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QuickSpecs

HP x360 310 G1 PC

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