QuickSpecs

Overview

HP Pro x2 410 G1 PC
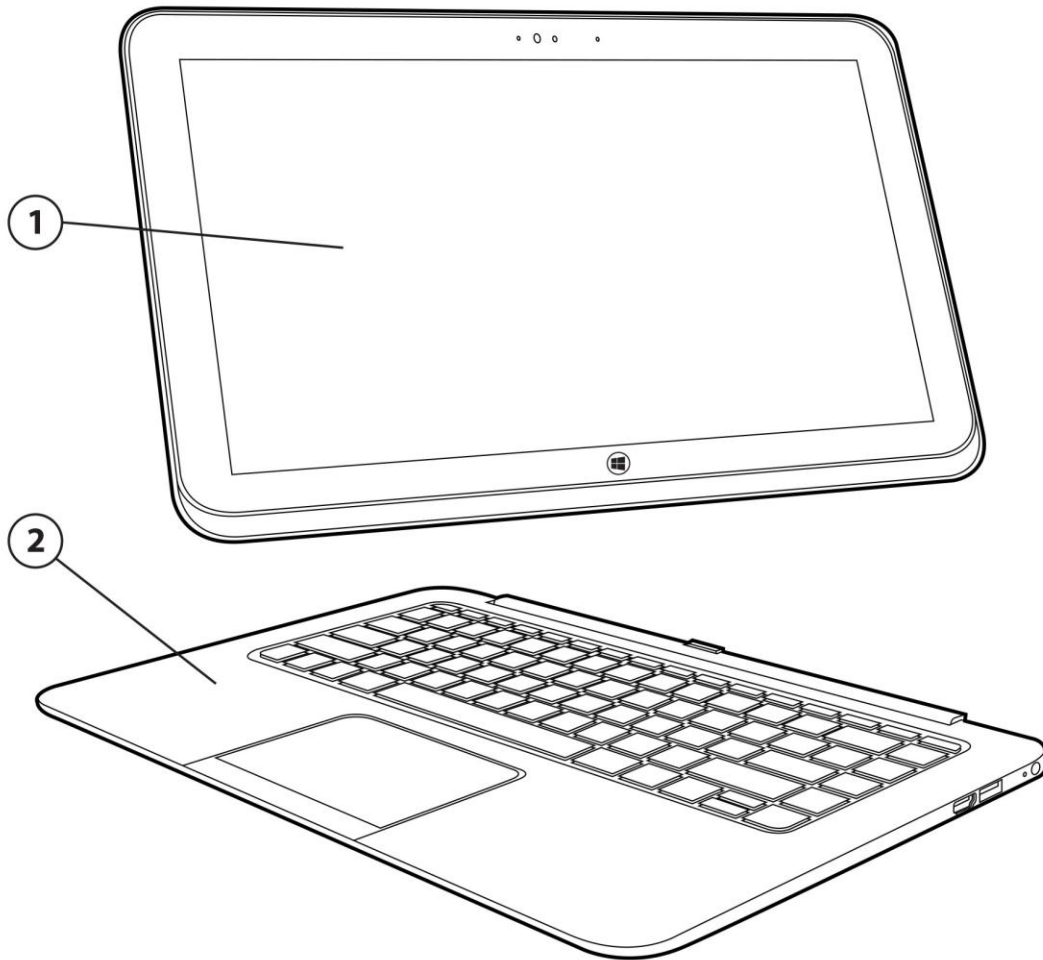
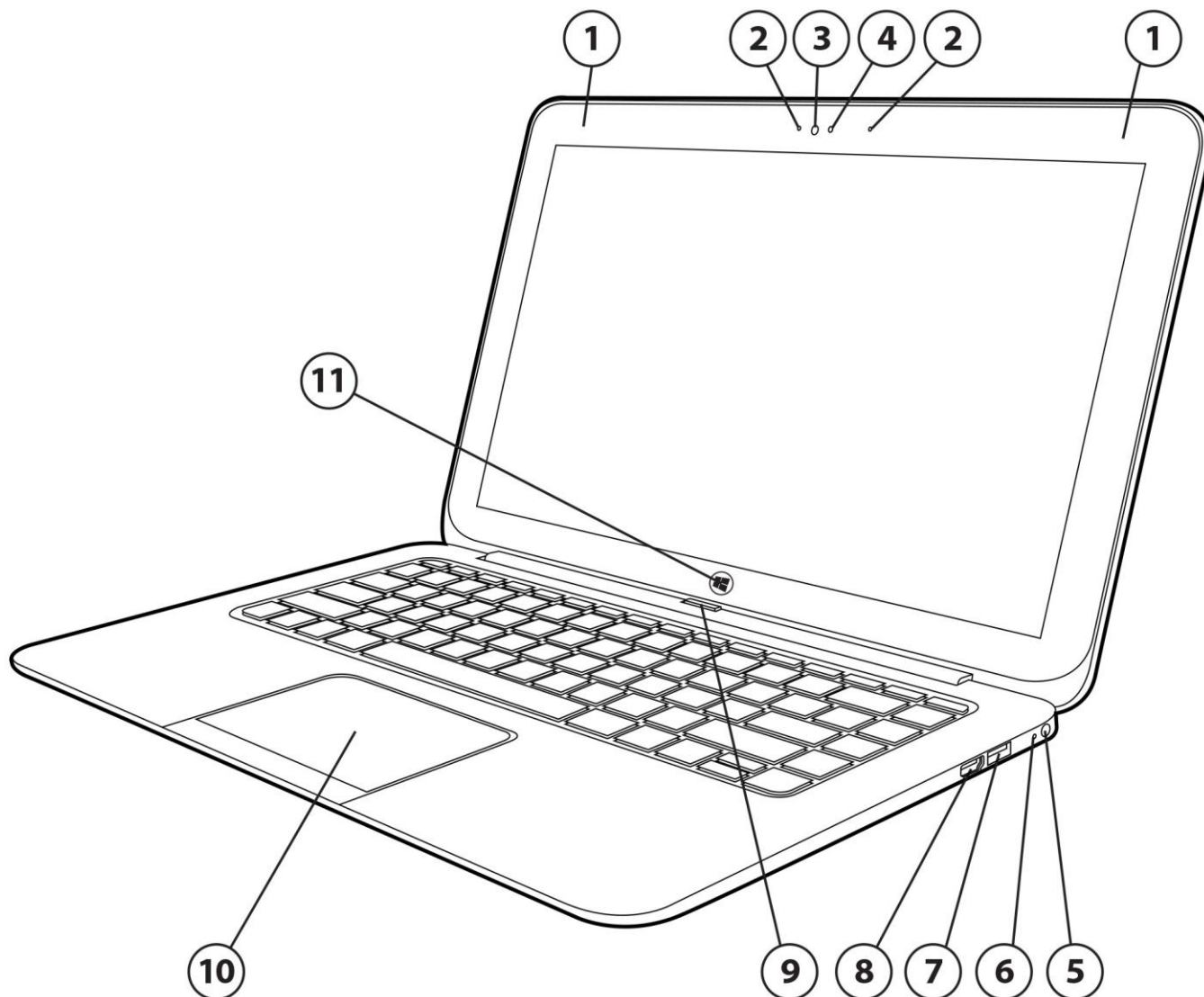

Separate Tablet and Base

1. 11.6" Tablet
2. Base
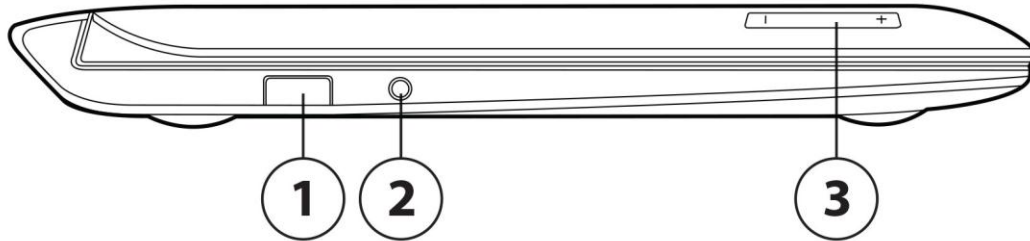
Overview

Front, Right

1. WLAN antennas
2. Dual-microphone array
3. 1080p FHD Webcam
4. Webcam LED
5. Power connector
6. AC Adapter/battery light

7. USB 3.0 port
8. HDMI v1.4a port
9. Button to detach tablet from base
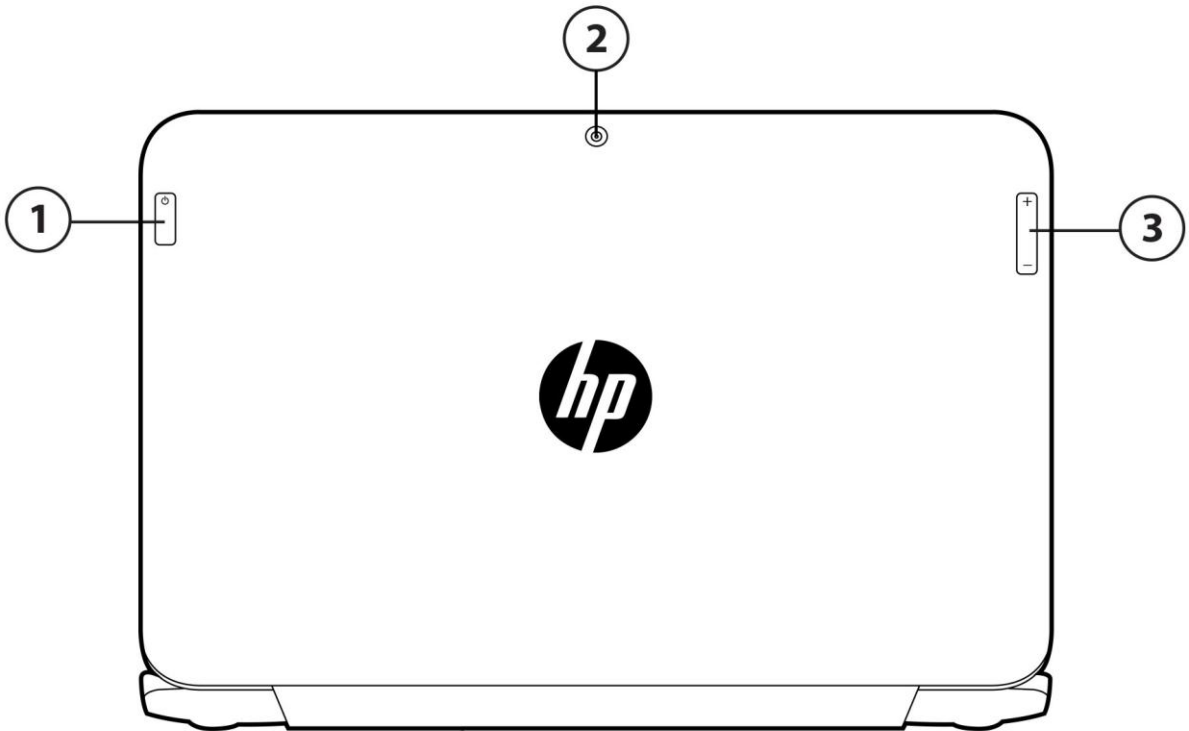10. Clickpad
11. Windows home button

Overview

Left

1. USB 2.0 port
2. Stereo headphone-out/mic-in combo jack

3. Volume +/- button

Overview

Rear

1. Power button
2. 1080p FHD Webcam
3. Volume +/- button

Overview
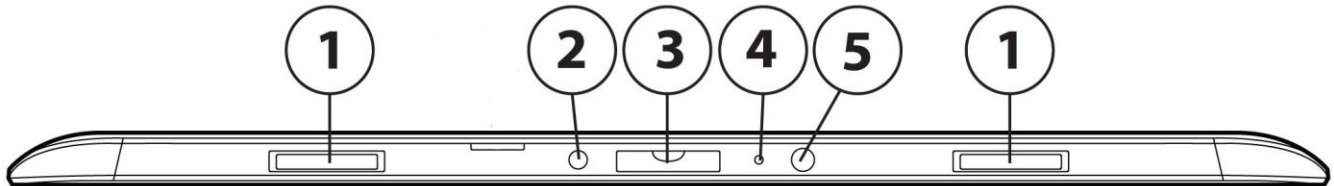
Rear– Base

1. Hinge tab cavities
2. Audio jack
3. Micro-SD 3-in-1 reader
4. AC plug LED
5. Power connector

Overview

At A Glance

- Detachable hybrid tablet 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 64
- Ultrabook™ compliant
- 4th generation Intel® Core™ i5-4202Y processor or 4th generation Intel® Core™ i3-4012Y processor
- Integrated Intel HD Graphics 4200
- 11.6" diagonal LED HD (1366 x 768) Touchscreen
- 64 GB, 128 GB or 256 GB M.2 SATA-3 (NGFF) Solid State Drives
- 0.88 inch (22.3 mm) thin profile
- Weight of clamshell starting at 3.48 lbs (1.578 kg), tablet weight starting at 1.8 lbs (0.816 kg)
- HP Beats Audio with integrated stereo speakers, integrated microphone array, front and rear facing HP TrueVision FHD Webcams
- Full sized backlit island-style keyboard with UV coating
- Easily hot dock with one of the optional HP port replicators
- 2-cell (28 WHr) polymer battery (tablet) and 2-cell (21 WHr) polymer battery (base)
- Clickpad w/ multi-touch gesture support image sensor
- Security features including a TPM 1.2 Embedded Security Chip
- Wireless connectivity:
  - Ralink RT3290LE 802.11 b/g/n (1x1) Bluetooth® 4.0 Combo*
  - Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n (2x2) WiFi + BT 4.0 combo* (INDO not supported)
  - Intel Dual Band Wireless-N 7260BN 802.11 b/g/n (2x2) WiFi + BT 4.0 combo *
- 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.

Features

PRODUCT NAME

HP Pro x2 410 G1 PC

OPERATING SYSTEM

Preinstalled   Windows 8.1 Pro 64*
                          Windows 8.1 64*

* 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 microsoft.com/

PROCESSOR*

4th Generation Intel® Core™ i5-4202Y (1.6 GHz, 3 MB L3 cache, 2 cores)*
  Up to 2.60 GHz with Intel Turbo Boost Technology**
4th Generation Intel® Core™ i3-4012Y (1.5 GHz, 3 MB L3 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. ** 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 intel.com/technology/turboboost for more information.

CHIPSET

Integrated SoC PCH

GRAPHICS

Integrated:
Intel HD Graphics 4200
- Support HD Decode, DX11, and HDMI
- Support PX5.0

DISPLAY

Internal
11.6" diagonal HD* IPS LED (1366 x 768) Touchscreen

- Ultra- Wide-viewing angle
- Ultra-slim (2.5mm)
- Touchscreen, Multi-touch enabled (10-finger support)

External
Up to 32-bit per pixel color depth

HDMI
1.4a port supports up to 1080p, 1920 x 1080 at 60Hz

* HD content required to view HD images.
NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.

Features

STORAGE AND DRIVES

Internal Storage Device*

64/128/256 GB M.2 SATA-3 (NGFF) Solid State

* For SSD's, GB=1 billion bytes. TB=1 trillion bytes. Actual formatted capacity is less. Up to 30GB (for Windows 8.1) of system disk is reserved for system recovery software.

MEMORY

DDR3L SDRAM (1600 MHz)
On-board
Standard 4096 MB memory

NETWORKING/COMMUNICATIONS

Wireless

Support for a broad range of secure, integrated wireless LAN options featuring support for the latest industry standards

Wireless LAN (WLAN)

Ralink RT3290LE 802.11 b/g/n (1x1) Bluetooth® 4.0 Combo*
Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n (2x2) WiFi + BT 4.0 combo* (INDO not supported)
Intel Dual Band Wireless-N 7260BN 802.11 b/g/n (2x2) WiFi + BT 4.0 combo*

* 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 and Back)

Integrated HP TrueVision Full HD* Webcam**

- FHD* format
- 1080p
- 2.0MP
- Supports videoconferencing and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1920x1080 resolution (1080p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

*HD content required to view HD images.
** Internet access required.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

The 101/102-key island-style keyboard features a full-pitch key layout with desktop keyboard features, such as editing

Features

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
Accelerometer, Gyroscope, Digital Compass, Ambient Light Sensor (ALS)

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

Browser and Toolbars
Internet Explorer 10

UI Enhancements
HP Utility Center

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*
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)

Features

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
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***
*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 hpconnected.com.

Standard
McAfee LiveSafe subscription (30 Day Subscription)*

Features

HP SimplePass
TPM 1.2 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: hp.com/go/security.

POWER

Power Supply

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

Primary Battery (Tablet)
HP 2-cell polymer (28 WHr)

Primary Battery (Base)
HP 2-cell polymer (21 WHr)

Battery Life
HP 2-cell polymer (28 WHr)	Up to TBD Hours
HP 2-cell polymer (21 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 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.

QuickSpecs

Features

WEIGHTS & DIMENSIONS

Weight (Clamshell configuration)
Starting at 3.48 lbs (1.578 kg) (weight will vary by configuration)

Weight (Tablet)
Starting at 1.8 lbs (0.816 kg) (weight will vary by configuration)

Dimensions (w x d x h) (Clamshell configuration)
11.93 x 8.17 x 0.88 in (303 x 207.69 x 22.3 mm)

Dimensions (w x d x h) (Tablet)
11.93 x 7.60 x 0.46 in (303 x 193 x 11.6 mm)

Dimensions (w x h) (Base)
11.93 x 7.60 x 0.40 in (303 x 193 x 10.2 mm)

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

PORTS/SLOTS

Ports

Base
USB 3.0 – One
USB 2.0 – One
HDMI v1.4a – One
Stereo headphone-out/mic-in combo jack – One
Docking connector to tablet – One
DC in port – One

Tablet
Stereo headphone-out/mic-in combo jack – One
Docking connector to base – One
DC in port – One

Expansion Slots
Base supports SD/SDHC/SDXC with UHS (Ultra high speed)
Tablet has a micro-SD 3-in-1 reader.

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: 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.

Features

hp.com/go/cpc.

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	**Nominal Operating Voltage**	19.5 V
	Average Operating Power	TBD W
	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)
	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) maximum wet bulb temperature
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®	TBD models*
	EPEAT	TBD**
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	CIT	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

* Configurations of the HP Pro x2 410 G1 PC that are ENERGY STAR qualified are identified as HP Pro x2 410 G1 PC on HP websites and on energystar.gov.

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

Technical Specifications

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

DISPLAYS

11.6-inch diagonal LED 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	400 nit (typical)	
	Pixel Resolution	**Format**	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	Viewing Angle	40/40/15/30 (Left/Right/Down/Up) (typical)	

STORAGE AND DRIVES

Internal Storage

64 GB* M.2 Solid State Drive	**Drive Weight**	10 grams	
	Capacity	64 GB	
	Height	0.091 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	SATA 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 500 MB/s	Up to 250 MB/s
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM	
128 GB* M.2 Solid State Drive	**Drive Weight**	10 grams	
	Capacity	128 GB	
	Height	0.091 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Interface	SATA 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 500 MB/s	Up to 250 MB/s
	Logical Blocks	250,069,680	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM	
256 GB* M.2 Solid State Drive	**Drive Weight**	10 grams	
	Capacity	256 GB	

Technical Specifications

Height	0.091 in (2.3 mm)	
Width	0.87 in (22 mm)	
Interface	SATA Gen 3 (6 Gb/s)	
Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
	Up to 500 MB/s	Up to 350 MB/s
Logical Blocks	500,118,192	
Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM	

* For solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and 30 GB (for Windows 8.1) of system disk is reserved for the system recovery software.

NETWORKING/COMMUNICATIONS

Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n (2x2) WiFi + Bluetooth 4.0 Combo Adaptor*	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n	
	Interoperability	Wi-Fi certified	
	Frequency Band	802.11b/g/n	2.402 - 2.482 GHz
		802.11a/n	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
	Antenna Structure	2 transmit; 2 receive (2x2)	
	Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 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 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.	
	Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM	
	Security[1]	• 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	

Technical Specifications

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 Power[2]	• 2.4G: +13.5dBm minimum • 5G: +12dBm minimum
Power Consumption	Transmit: 2.0 Watts Receive: 1.6 Watts Idle mode[3]: 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[4]	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) 802.11b:-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:-69 dBm (150 Mbps), -66 dBm (300 Mbps)
Antenna Connections	2 U.FL type connectors (output impedance of 50 ± 2 ohms)
Form Factor	PCI-Express Half-MiniCard
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)
Weight	3.1g
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 Off - Radio OFF; Solid LED On - 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

Technical Specifications

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
Dimensions	1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 mm)
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	-1.5 dBm to 4 dBm (Bluetooth Class II)
Receiver Sensitivity	Better than -20 dBM at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 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
Security	Full support of Bluetooth Security Provisions
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	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]

Technical Specifications

FAX Profile (FAX)
Basic Imaging Profile (BIP)[2]
Headset Profile (HSP)
Hands Free Profile (HFP)
Advanced Audio Distribution Profile (A2DP)

1. Indicates the profile is supported by Microsoft Windows XP SP2

2. Indicates the profile is part of Windows Vista

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

Intel Dual Band Wireless-N 7260BN 802.11 b/g/n (2x2) WiFi Adapter + BT 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
	802.11n	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
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: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.	
Modulation	Direct Sequence Spread Spectrum CCK, BPSK, QPSK, 16-QAM, 64-QAM	
Security[1]	• 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 Power[2]	• 2.4G: +13.5dBm minimum • 5G: +12dBm minimum	
Power Consumption	Transmit: 2.0 Watts Receive: 1.6 Watts	

Technical Specifications

	Idle mode[3]: 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio off: 75 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[4]	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:-69 dBm (150 Mbps), -66 dBm (300 Mbps)	
Antenna Connections	2 U.FL type connectors (output impedance of 50 ± 2 ohms)	
Form Factor	PCI-Express Half-MiniCard	
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)	
Weight	3.1g	
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; Solid LED On - 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.

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

HP Integrated Module with Bluetooth 4.0+EDR Wireless Technology

Bluetooth Specification	4.0+EDR Compliant
Dimensions	1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 mm)
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

Technical Specifications

		or 1306.9 kbps symmetric
	Transmit Power	-1.5 dBm to 4 dBm (Bluetooth Class II)
	Receiver Sensitivity	Better than -20 dBM at 0.1 % raw bit error rate
	Power Consumption	Peak (Tx) 264 mW Peak (Rx) 231 mW Sleep <1 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
	Security	Full support of Bluetooth Security Provisions
	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	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)

1. Indicates the profile is supported by Microsoft Windows XP SP2
2. Indicates the profile is part of Windows Vista
* Wireless access point and internet service required. Availability of public wireless access points limited.

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

Technical Specifications

Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows7 (details at: 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
Security[1]	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 Models	Ad-hoc (Peer to Peer) 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) Receive: 2.0 W (max)
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	72.2 Mbps: -70 dBm; 54 Mbps: -74 dBm; 11 Mbps: -88 dBm ; 1 Mbps: -95 dBm
Antenna type	High efficiency dual antenna with spatial diversity, mounted in the display enclosure
Form Factor	PCI-Express Half-MiniCard
Weight	6 g
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)
	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)

Technical Specifications

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 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	-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
Security	Full support of Bluetooth Security Provisions
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

Technical Specifications

		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)

* 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 Controls	Volume up, volume down, and mute
	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 Distortion	0.01%
	Noise Floor	-110 dB
	Play/Record Sampling Rate(s)	8 kHz - 48kHz
	DAC	16, 20 or 24-bit
	ADC	16 or 20-bit
Internal Stereo Speaker	**Power Rating**	2 Watts
	Impedance	4 ohms

Technical Specifications

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 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.	
HP 2-cell Polymer Battery (21 WHr)	**Dimensions** (h x w x l)	294.0 x 130.8 x 3.43 (not including WTB connector) 294.0 x 148.30 x 3.43 (including WTB connector)	
	Weight (max)	< 185 g	
	Cells/Type	2-cell Polymer	
		Watt-hour capacity	28 WHr
	Temperature	**Operating (Charging)**	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (–10° to 60° C)
		Non-operating	–4° to 140° F (–20° to 60° C)
	Warranty	1 year	
HP 2-cell Polymer Battery (28 WHr)	**Dimensions** (h x w x l)	268.0 x 119.0 x 4.25 mm (not including screw holes) 284.2 x 134.9 x 4.25 mm (including screw holes)	
	Weight (max)	< 190 g	
	Cells/Type	2-cell Polymer	
		Watt-hour capacity	28 WHr
	Temperature	**Operating (Charging)**	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (–10° to 60° C)

Technical Specifications

Non-operating	–4° to 140° F (–20° to 60° C)	
Warranty	1 year	

COUNTRY OF ORIGIN

China

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

Type	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
	HP Business Slim Top Load (up to 14.1" x .75" thick)	H5M91AA
	HP Ultrabook Professional Sleeve 12.5	F7Z98AA
Docking	HP USB 2.0 Port Replicator	H1L07AA#xxx
	HP USB 3.0 Port Replicator	H1L08AA#xxx
	HP Universal Port Replicator	E6D70AA#xxx
	HP 3001pr USB 3 Port Replicator	F3S42AA#xxx
	HP LCD Monitor Stand	QM196AA
Input/Output	HP Bluetooth Keyboard	F3J73AA#xxx
	HP Touch To Pair Mouse	H6E52AA#ABB
	HP Ultra Mobile Wireless Mouse	H6F25AA
Adapters	HP 45W Smart AC Adapter (4.5mm)	H6Y88AA#xxx
	HP 65W Smart AC Adapter (4.5mm)	H6Y89AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
Security	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

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

should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.