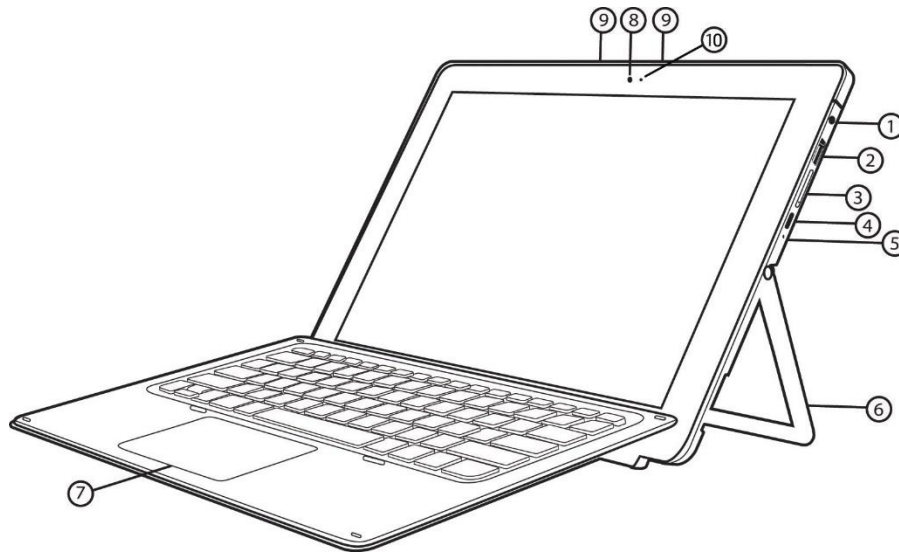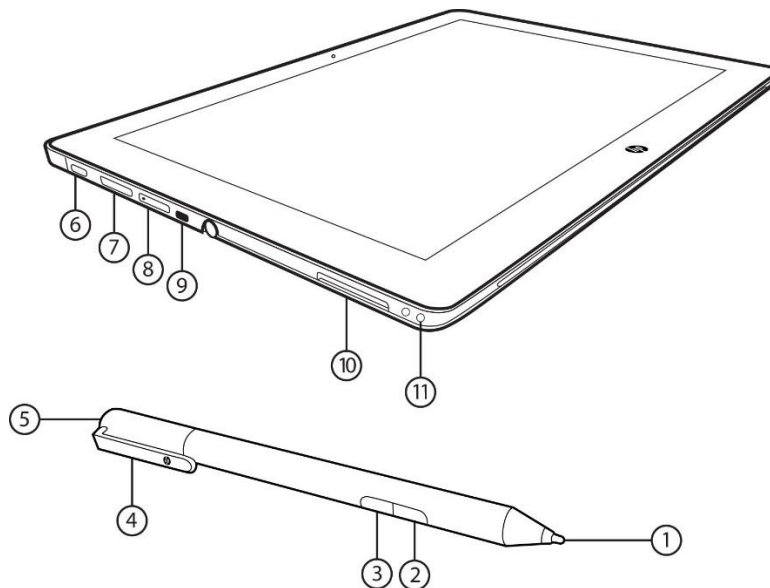## Overview

HP Elite x2 1012 G1

1. Combo Headset
2. USB A
3. SD Card Slot
4. USB Type-C™
5. Power LED

6. Kickstand
7. ClickPad
8. Front Camera
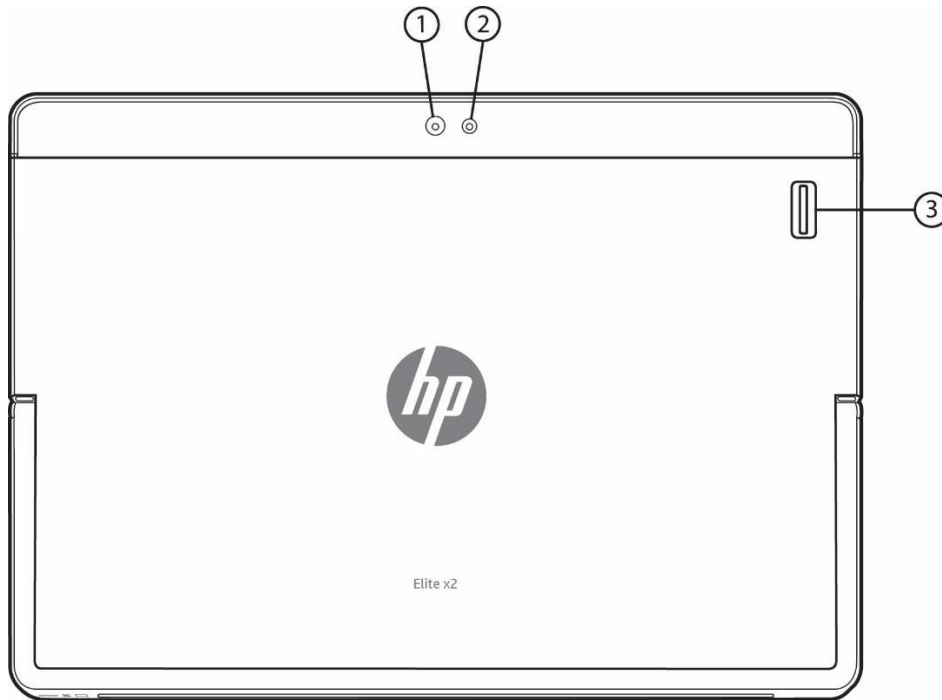9. Microphones
10. Camera LED

1. Tip
2. Erase
3. Select
4. Clip
5. Application Launch Button (Default OneNote)

7. Volume Up/Volume down
8. SIM card slot
9. Lock Slot
10. There is no slot in there, it's just to open the kickstand.
11. Tether

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

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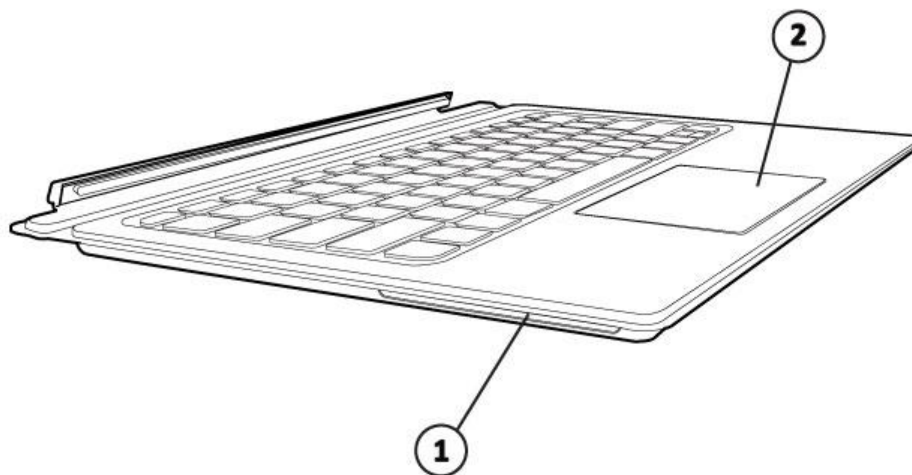## Overview

1. Camera
2. Camera Flash

3. Fingerprint Reader (optional)

Advanced Keyboard

1. Smartcard Slot

2. ClickPad/NFC area

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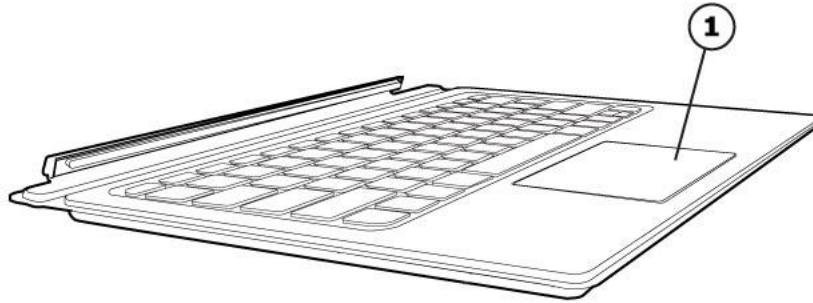
Travel Keyboard

1.   ClickPad

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

At A Glance

- Designed for excellent mobility this stylish and thin 2-in-1 design is built to the standards of Elite durability
- The quiet fanless design and 10 hours of battery life[1] lets you work, surf, and connect with colleagues
- Windows 10 versions, Web support for Windows 8.1
- 6th Generation Intel® Core™ M processors, some with vPro™ support[2]
- 12.0" diagonal ultra-slitm LED-backlit Full HD (1920 x 1280) Multi-Touch Display
- Solid State Drives up to 512 GB , PCLe NVMe drives support up to 256GB
- Weight starting at 820g for Tablet
- Height starting at 8.05mm for Tablet
- MIL-STD 810G tested
    - MIL STD is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. MIL STD test results are not a guarantee of future performance under these test conditions. Damage from drops requires separately purchase Accidental Damage Protection HP Care Pack.
-
- Audio by Bang & Olufsen
- Dual microphone array with HP Advanced Noise Reduction Software
- Front and Back facing camera and webcam
- Supports a broad range of wireless broadband and Wi-Fi options for connectivity on the go
- Optimized security using industry standard technologies such as TPM2.0, optional integrated fingerprint reader and an optional smart card reader in the optional Advanced keyboard
- Protect your device and data using the latest HP security technology solutions: HP Sure Start, HP BIOSphere and HP Client Security.
- Standard commercial 1 year limited warranty with extended service available with optional HP Care Packs.

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

[1] Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

[2] vPro™ support not available on all configurations.

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

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QuickSpecs

Technical Specifications

PRODUCT NAME

HP Elite x2 1012 G1

OPERATING SYSTEM

Preinstalled   Windows 10 Pro 64*
                          Windows 10 Home 64*

Web-only Support   Windows 10 Pro 64
                          Windows 10 Home 64
                          Windows 10 Enterprise 64
                          Windows 8.1 Pro 64
                          Windows 8.1 64
                          Windows 8.1 Enterprise 64

* 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://http://www.microsoft.com

PROCESSOR*

Intel® Core™ M processor, 6th Generation processors:

Intel® Core™ M7-6Y75 with Intel HD Graphics 515
(1.2 GHz, up to 3.1 GHz with Intel Turbo Boost Technology**, 4 MB cache, 2 cores), vPro™ Support

Intel® Core™ M5-6Y57 with Intel HD Graphics 515
(1.1 GHz, up to 2.8 GHz with Intel Turbo Boost Technology**, 4 MB cache, 2 cores), vPro™ Support

Intel® Core™ M5-6Y54 with Intel HD Graphics 515***
(1.1 GHz, up to 2.7 GHz with Intel Turbo Boost Technology**, 4 MB cache, 2 cores)

Intel® Core™ M3-6Y30 with Intel HD Graphics 515
(0.9 GHz, up to 2.2 GHz with Intel Turbo Boost Technology**, 4 MB 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.. Performance and clock frequency will vary depending on application workload and 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
http://www.intel.com/technology/turboboost for more information.
***Available for SMB store and Channel only. Not recommended for corporate enterprise deployments.

Technical Specifications

CHIPSET

Integrated with processor

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

GRAPHICS

Intel® HD Graphics 515

DISPLAY

Internal

Touch screen

12.0" diagonal BrightView LED-backlit WUXGA UWVA eDP 1.3 Ultra-slim (1920 x 1280 – Full HD*) Touch screen Chemically-strengthened Corning® Gorilla® Glass 4 top cover directly bonded to display

Refresh Rate	60 Hz	
Brightness	340 nits (typical)	
Pixel Resolution	Format	1920 x 1280 (WUXGA+)
	Configuration	RGB Stripe
Interface	eDP 1.3	
LCD Mode	IPS/FFS/VA	
PPI	192 ppi	
Viewing Angle	UWVA 85/85/85/85 (Left/Right/Down/Up)	

External

24-bit + 8 bit alpha channel (standard)

Up to 30-bit per pixel color depth (Wide Color Gamut)

* HD content required to view HD images.

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

STORAGE AND DRIVES

Internal Storage*

Supports M.2 SSD SS 2280

128 GB SATA III Solid State Drive

180 GB SATA III Solid State Drive

180 GB SATA III SED OPAL2 Solid State Drive

256 GB SATA III Solid State Drive

256 GB SATA III Solid State Drive PCIe NVMe

256 GB SATA III SED OPAL2 Solid State Drive

512 GB SATA III Solid State Drive

* For SSD's, GB=1 billion bytes. TB=1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and up to 30 GB (for Windows 8 and 10) of system disk is reserved for system recovery software.

Expansion Storage

Micro SD Media Reader Slot - Supports microSD, microSDHC, microSDXC, supporting expansion up to 200GB

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

MEMORY

LPDDR3-1866 (Transfer rates up to 1866 MT/s)
Supports Dual Channel Memory
Soldered Down

Standard
4 GB Total System Memory
8 GB Total System Memory

Maximum
Up to 8 GB

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 is supported via combo card.

Wireless WAN (WWAN)*

HP hs3110 HSPA+ Intel® Mobile Broadband*
HP lt4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband*
HP lt4225 LTE/EV-DO Gobi™ 4G Mobile Broadband*
HP lt4226 LTE/HSPA+ Gobi™ 4G Mobile Broadband*

Wireless LAN (WLAN)**

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 Combo;
Intel® Tri Band Wireless-AC 18260 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.2 + WiGig Combo;

* WWAN is an optional feature and requires factory configuration. WWAN 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. 4G LTE not available on all products, in all regions
**Wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.
***The WiGig-compatible notebook or tablet must be positioned within 1.2 m (4 ft) and without obstruction in the line of sight of the wireless dock. HP Advanced Wireless Docking is compatible with the HP Elite x2 1012 G1 with an optional installed Intel Tri Band Wireless AC with WiGig Combo card available at the time of purchase.

AUDIO/MULTIMEDIA

Audio
Audio by Bang & Olufsen
Dual speakers (top facing)
Dual microphone array with echo cancellation, noise suppression
Headphone line-out and microphone-in (combo)

Technical Specifications

HP Advanced Noise Reduction Software

Camera – Front
Integrated 2 MP (1080p)

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

Camera – Back
Integrated 5 MP (1080p)

- 1080p format for video
- 5 MP for still capture
- Supports videoconferencing* and still image capture
- High quality auto 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

* Internet access required.

ACTIVE PEN

HP Active Pen with Bluetooth® App Launch

Pen Technology	Wacom
Digitizer	N/A, shared with touch
Dimensions	147.29 x 9.5 mm
Weight	17.5 g
Power	AAAA battery and 319 coin cell x2
System Requirements	Windows 8.1/10
Tip Diameter	1 mm
Pressure Sensitivity (Y/N)	Yes (2048 levels)
Buttons (Y/N)	Yes, 3
Resolution	192 ppi
Hover Capability (Y/N)	Yes
Hover Height (mm)	10mm+ (max to 15mm)
Off Screen Writing Supported (Y/N)	8 mm+
Palm Rejection (Y/N)	Yes
Tilt Angle (Y/N)	Yes
3D Input Support (Y/N)	Change to >60° from vertical

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

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Technical Specifications

Battery Life Based on Continuous Usage	7.5 month+ with 1 hour non-stop usage per day

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

Optional HP Elite x2 1012 G1 Travel Keyboard*

Kit contents	HP Elite x2 1012 G1 Travel Keyboard and documentation
Weight	.848 lb (385 g)

Optional HP Elite x2 1012 Advanced Keyboard *

Kit contents	HP Elite x2 1012 Advanced Keyboard and documentation
Key Features	Smart card reader FIPS-201 compliant.
	Security - Near Field Communications (NFC) Module
Weight	.992 lb (450 g)

*Sold only as an optional feature

Keyboard Features (common to both Travel and Advanced Keyboards)

- Backlit
- HP Dura Keys
- ClickPad™ (91 x 51 mm) with image sensor, multi-touch gestures enabled, on/off function and LED indicator
- 150° viewing angle
- Docking connector to tablet
- Full size 81/82-key island-style backlit keyboard with full row of function keys and LED indicators

Function Keys	F1 - Blank
	F2 - Blank
	F3 - Sleep
	F4 - Display Switching
	F5 - Mute
	F6 - Volume Down
	F7 - Volume Up
	F8 - Mic Mute
	F9 - Brightness Down
	F10 - Brightness Up
	F11 - Backlight Toggle
	F12 - Wireless On/Off
ClickPad	Glass with chemical etched surface
	Supports 2-way scroll
	Taps enabled as default
	Gestures enabled by default - 2 Finger Scrolling, 2 Finger Zoom (Pinch)

SOFTWARE AND SECURITY

Preinstalled Software with Windows Operating System

HP BIOS

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

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Technical Specifications

HP BIOSphere[1]
HP Sure Start with Dynamic Protection
HP DriveLock | HP Automatic DriveLock
HP BIOS Protection[2]
HP SpareKey[3]
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Pre-Boot Security
Secure Erase[4]
Hybrid Boot (Windows 8.1 only)
Measured Boot (Windows 8.1 only)
Secure Boot (Windows 8.1 only)
Absolute Persistence Module[5]

MultiMedia
Cyberlink Power2Go
Cyberlink Power DVD

Communication
HP Mobile Connect Pro[6]
Intel WiDi Software[7]

HP Value Add Software
HP ePrint Driver [8]
HP Hotkey Support
HP Support Assistant
HP Recovery Manager (Windows 7 only)
HP Recovery Disc Creator (Windows 7 only)
HP Noise Reduction Software

3rd Party

Foxit PhantomPDF Express for HP

Microsoft Products

Buy Office
Bing Search
Skype[9]

Manageability
HP Driver Packs [10]
HP SoftPaq Download Manager (SDM)
HP System Software Manager (SSM)[10]
HP BIOS Config Utility (BCU)[10]
HP Client Catalog[10]
HP CIK for Microsoft SCCM[10]
LANDESK Management[11]
HP Touchpoint Manager[12]

Technical Specifications

For more information on HP Client Management Solutions refer to: http://www.hp.com/go/clientmanagement.

Client Security Software
HP Client Security

- HP Security Manager (including Credential Manager and Password Manager)
- HP Drive Lock
- HP Fingerprint Sensor
- HP Password Manager
- Absolute Persistence Module
- Power On Authentication
- Microsoft Security Essentials[13]
- Microsoft Defender[13]

Standard
TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified)
HP Fingerprint Reader (selected models)

For more information on HP Client Security Software Suite, refer to http://www.hp.com/go/clientsecurity.

1. HP BIOSphere features may vary depending on the PC platform & configuration.
2. HP BIOS Protection requires a HPTools partition for automatic recovery.
3. Requires initial user set up.
4. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.
5. BIOS Absolute Persistence module is shipped turned off, and will be activated when customers purchase and activate a subscription. Service may be limited. Check with Absolute for availability outside the U.S. The optional subscription service of Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/computrace-agreement. If Data Delete is utilized, the Recovery Guarantee payment is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either create a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
6. HP Mobile Connect Pro is only available on preconfigured devices with WWAN. For geographic availability refer to www.hp.com/go/mobileconnect
7. Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, TV or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, TV or computer monitor via a standard HDMI cable, also sold separately.
8. Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see http://www.hp.com/go/businessmobileprinting).
9. Skype is not offered in China.
10. Not preinstalled, however available for download at http://www.hp.com/go/clientmanagement
11. LANDesk is an optional feature sold separately. Managed devices must be connected to the management server. Location based functionality requires active LANdesk maintenance service. Wipe functionality performs a "Windows 8 Reset" and requires Windows 8. Lock performs a Windows "Lock Computer."
12. HP Touchpoint Manager requires purchase of a subscription and supports Android™, iOS and Windows 7 or higher operating systems and PCs, notebooks, tablets and smartphones from various manufacturers. Not available in all countries see www.hp.com/touchpoint for availability information.
13. Opt in and internet connection required for updates.

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

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Technical Specifications

POWER

Power Supply
45W USB Type-C™ AC Adapter
- USB Type-C™ DC integrated cord (1.8m)
- AC Power cord (0.45m)
- AC Adapter Weight: 200g

Tablet – Battery
HP 4-cell, Long Life 40 WHr Li-Ion
- Voltage – 7.7 V

Battery Life*
Windows 10 battery time:
Up to 10 hours and 15 minutes*
* Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Weight*
Tablet only
Starting at 1.8 lbs (820 g)

Tablet with Travel Keyboard
2.65 lbs (1205 g)

Tablet with Advanced Keyboard
2.79 lbs (1270 g)

Dimensions - (w x d x h)*
Tablet
11.8 x 8.4 x 0.3 in (300 x 213.5 x 8.05 mm)

Tablet with Travel Keyboard
11.8 x 8.4 x 0.5 in (300 x 213.5 x 13.45 mm)

Tablet with Advanced Keyboard
11.8 x 8.4 x 0.6 in (300 x 213.5 x 16.45 mm)

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

Technical Specifications

*Values are preliminary and may be updated before product launch.

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

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Technical Specifications

PORTS/SLOTS

Tablet

Ports

1 USB Type-C™, supporting USB 3.1 (supports Thunderbolt™ 3)

1 USB Type-A, supporting USB 3.0

1 Headphone /microphone combo

NOTE: For optimal performance, the HP x2 1012 G1 should charge from a USB Power Delivery, v2 compatible adapter or power source that offers 12V @ 3A.

Slots

1 Micro SIM drawer (optional)

Micro SD Media Reader Drawer -supports microSD, microSDHC, microSDXC

Lock slot

Advanced Keyboard

Ports

Slots

1 Smart Card Reader

SENSORS

Accelerometer

Magnetometer

Gyro

ALS (Ambient Light Sensor)

Proximity (SAR for WWAN)

Hail Sensor

SERVICE AND SUPPORT

HP Services offers 3-year, 1-year and 90 day limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/cpc.

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. For details, visit www.hp.com/go/cpc.

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

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Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	12 V	
	Average Operating Power		
	Max Operating Power	< 36 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	240 G, 2 ms, half-sine	
Random Vibration	Operating	1.043 grms	
	Non-operating	3.50 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)	

STORAGE AND DRIVES

128 GB* M.2 Solid State Drive	Drive Weight	10 grams	
	Capacity	128 GB	
	Height	0.09 in (2.3mm)	
	Width	0.87 in (22 mm)	
	Interface	SATA 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s	Up to 300 MB/s
	Logical Blocks	250,069,680	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM; DVESLP	
180 GB* M.2 Solid State Drive	Drive Weight	10 grams	
	Capacity	180 GB	
	Height	0.09 in (2.3mm)	
	Width	0.87 in (22 mm)	
	Interface	SATA Gen 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540 MB/s Compressible performance)	Up to 490 MB/s (Compressible performance)

Technical Specifications

	Logical Blocks	351,651,888	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM; DEVSLP	
180 GB* M.2 Solid State Opal 2 Drive	**Drive Weight**	10 grams	
	Capacity	180 GB	
	Height	0.09 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 540 MB/s (Compressible performance)	Up to 490 MB/s (Compressible performance)
	Logical Blocks	351,651,888	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; TCG OPAL 2.x; ATA-8, SATA 3.0; DIPM; TRIM; DEVSLP	
256 GB* M.2 Solid State Drive	**Drive Weight**	10 grams	
	Capacity	256 GB	
	Height	0.09 (2.3mm)	
	Width	0.87 in (22 mm)	
	Interface	SATA Gen 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		Up to 540MB/s	Up to 455 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM; DEVSLP	
256 GB* M.2 Solid State Opal 2 Drive	**Drive Weight**	10 grams	
	Capacity	256 GB	
	Height	0.09 (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 540 MB/s	Up to 460 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; TCG OPAL 2.x; ATA-8, SATA 3.0; DIPM; TRIM; DEVSLP	
256 GB* M.2 Solid State PCIe 3X4 NVMe Drive	**Drive Weight**	10 grams	

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

	Capacity	256 GB	
	Height	0.09 (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 2260 MB/s	Up to 1260 MB/s
	Logical Blocks	500,118,192	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; PCle Gen3x4, TRIM, L1.2	
512 GB* M.2 Solid State Drive	**Drive Weight**	10 grams	
	Capacity	512 GB	
	Height	0.09 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 540 MB/s	Up to 500 MB/s
	Logical Blocks	1,000, 215, 216	
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
	Features	ATA Security; ATA-8, SATA 3.0; DIPM; TRIM; DEVSLP	

SECURITY

HP Fingerprint Reader	**Mobile Voltage Operation**	3.0V-3.6V
	Operating Temperature	14° – 167°F (-10° – 75°C)
(Optional – available on the Tablet)	**Current Consumption Image**	36 mA peak
	Low Latency Wait for Finger	950 uA
	Capture Rate	30 cm/sec
	ESD Resistance	IEC 61000-4-2 4B (±15KV)
	Detection Matrix	200*1 (plus another secondary line) 508 dpi 10 mm sensor area

NETWORKING/COMMUNICATIONS

WWAN Modules

HP hs3110 HSPA+ 3G Mobile Broadband Module*

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

Technology/Operating bands	HSPA+: 2100 (Band1), 1900 (Band 2), 1700 (Band 4), 850 (Band 5), 900 (Band 8) MHz E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 MHz (Band 5), 900 (Band 8) MHz
Wireless protocol standards	E-GPRS: Class B, Multi-slot class 33, coding schemes CS1 - CS4 and MSC1 - MSC9. UMTS/WCDMA: Release 99 and Release 7
GPS	Standalone, A-GPS
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) HSPA: 7.2 Mbps (Download), 5.76 Mbps (Upload) WCDMA PS: 384 kbps (Download), 384 kbps (Upload) WCDMA CS: 64 kbps (Download), 64 kbps (Upload) E-GPRS: 296 kbps (Download), 236.8 kbps (Upload) GPRS: 107 kbps (Download), 85.6 kbps (Upload)
Maximum output power	HSPA+: 24 dBm E-GPRS 1800/1900: 26 dBm E-GPRS 850/900: 27 dBm GPRS 1800/1900: 30 dBm GPRS 850/900: 33 dBm
Maximum power consumption	HSPA+: 1,100 mA (peak); 800 mA (average) E-GPRS: 2,800 mA (peak); 700 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

* Mobile Broadband is an optional 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. 4G LTE not available on all products or in all countries.

HP lt4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module*

Technology/Operating bands	LTE: 2100 (Band 1), 1900 (Band 2), 1800 (Band 3), 1700/2100 (Band 4), 850 (Band 5), 2600 (Band 7), 900 (Band 8), 700 (Band 12 lower), 700 (Band 13 upper), 700 (Band 17 lower), 800 (Band 20), 700 (Band 28). HSPA+: 2100 (Band 1), 1900 (Band 2), 1700/2100 (Band 4), 850 (Band 5), 900 (Band 8) MHz EV-DO: 850 (BC0), 1900 (BC1) MHz (Only work with Verizon network) E-GPRS: 1900 (Band 2), 1800 (Band 3), 850 (Band 5), 900 (Band 8) MHz
Wireless protocol standards	3GPP Release 10 LTE Specification CAT.4, 20MHz BW WCDMA R99, 3GPP Release 5, 6, 7 and 8 UMTS Specification 1xEVDO Release 0, A and B. E-GPRS: Class B, Multi-slot class 12, coding schemes CS1 - CS4 and MSC1 - MSC9
GPS	Standalone, A-GPS (MS-A, MS-B and XTRA)
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz

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

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Maximum data rates	LTE: 150 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21Mbps (Download), 5.76 Mbps (Upload) CDMA 1xRTT: 153.6 kbps (Download), 153.6 kbps (Upload) EVDO Rel.A: 3.1 Mbps (Download), 1.8 Mbps (Upload) EVDO Rel.B: 14.7 Mbps (Download), 5.4Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
Maximum output power	LTE: 23 dBm HSPA+: 23.5 dBm 1xRTT/EVDO: 24dBm E-GPRS 1900/1800: 26 dBm E-GPRS 900/850: 27 dBm GPRS 1900/1800: 29.5 dBm GPRS 900/850: 32.5 dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average) 1xRTT/EVDO: 1,000 mA (peak); 700 mA (average) E-GPRS: 2,800 mA (peak); 500 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6.2 g
Dimensions (Length x Width x Thickness)	42 x 30 x 2.3 mm

* Mobile Broadband is an optional 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. 4G LTE not available on all products or in all countries.

HP lt4225 LTE/EV-DO Gobi™ 4G Mobile Broadband Module*

Technology/Operating bands	LTE: 1400 (Band 11), 800 (Band 18, Japan 800 lower) EV-DO: 800 (BC0), 2100 (BC6) MHz
Wireless protocol standards	3GPP Release 8 LTE Specification EVDO Release 0 and Release A
GPS	Standalone, A-GPS
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 100 Mbps (Download), 50 Mbps (Upload) CDMA 1x: 153.6 kbps (Download), 153.6 kbps (Upload) EVDO Rev.A: 3.1 Mbps (Download), 1.8 Mbps (Upload)
Maximum output power	LTE: 23 dBm CDMA/EVDO: 24dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) EVDO: 900mA (peak); 720mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g

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Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

* Mobile Broadband is an optional 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. 4G LTE not available on all products or in all countries.

HP lt4226 LTE/HSPA+ Gobi 4G Module*

Technology/Operating bands	LTE: 2100 (Band 1), 800 (Band 19, Japan 800 upper), 1450 (Band 21) HSPA+: 2100 (Band 1), 800 (Band 6), 800 (Band 19) MHz
Wireless protocol standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
GPS	Standalone, A-GPS
GPS bands	1575.42 MHz ± 1.023 MHz, GLONASS 1596-1607MHz
Maximum data rates	LTE: 100 Mbps (Download), 50 Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload)
Maximum output power	LTE: 23 dBm HSPA+: 23.5 dBm
Maximum power consumption	LTE: 1,200 mA (peak); 900 mA (average) HSPA+: 1,100 mA (peak); 800 mA (average)
Form Factor	M.2, 3042-S3 Key B
Weight	6 g
Dimensions (Length x Width x Thickness)	1.65 x 1.18 x 0.09 in (42 x 30 x 2.3 mm)

* Mobile Broadband is an optional 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. 4G LTE not available on all products or in all countries.

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

Intel® Tri Band Wireless-AC 18260 802.11a/b/g/n/ac (2x2) and Bluetooth® 4.2 + WiGig Combo*

Form Factor	Combo Module, M.2 3030-S3-A
Dimensions	30.00±0.15mm by 30.00±0.15mm by 2.38mm max.
Weight	4 grams
Operating Voltage	3.3 Volts
Wireless LAN Standards	IEEE 802.11ad
Interoperability	Wi-Fi certified MAC and Physical Layer

WiFi Alliance/WiGig Alliance Protocol Adaption Layers (PALs) (Not yet ratified)

    Wireless Display Extension (WDE)
    Wireless Serial Extension (WSE)

Note: IP protocol is not supported

Frequency Band
802.11ad
57 – 66 GHz
Note: There are 4 bands (1, 2, 3, 4) but only 2 (bands 2 and 3) are supported in most of the countries on the planet. HP will support only bands 2 and 3, 59-64 GHz

Note: Not all countries allow unlicensed operation at these frequencies

Antenna Structure (Remote Front End Module, R-FEM)
Active, Beam Steering Array of 10 x 2 Elements, 8 x 2 Active Elements
Azimuth 8 active elements
Elevation 2 active elements
Vertical tilt of 20 to 30 degrees off of broadside
Horizontal beam steering ±65°, -6dB from peak gain
Vertical beam steering +80° -50°, -6dB from peak gain
Azimuth beam width ~20°, -6dB from peak gain
Elevation beam width ~80°, -6dB from peak gain
Omni (no beam forming) beam width ~110°, -6dB from peak gain
Vertical Polarization
Device side supports one R-FEM
Dock side supports one or two R-FEMs

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Data Rates (RAW)	MCS	Rate, Mbit/s	Modulation
	0	27.5	π/2-BPSK
	1	385.0	π/2-BPSK
	2	770.0	π/2-BPSK
	3	962.5	π/2-BPSK
	4	1155.0	π/2-BPSK
	5	1251.25	π/2-BPSK
	6	1540.0	π/2-QPSK
	7	1925.0	π/2-QPSK
	8	2310.0	π/2-QPSK
	9	2502.5	π/2-QPSK
	10	3080.0	π/-16QAM
	11	3850.0	π/-16QAM
	12	4620.0	π/-16QAM

Network Architecture Models	Ad-hoc (Peer to Peer)
Wireless Display Extension (WDE) WGA WDE support	AV PAL (WDE) as defined by WiGig alliance
AVC/MPEG support - encoder	WDE supports generation of MPEG-PS / MPEG-PES packets as described in the WDE standard WDE supports AVC (H264) encoder, intra only, 4:4:4 Chroma subsampling. Different visually lossless and lossy scenarios are supported by configuration
AVC/MPEG support – decoder	H.264 CAVLC 4:4:4 I-only sub sampling is supported
Type of Interface	Client device side • DP (Display port) v1.2a – HBR (1, 2, 4 lanes) Dock device side • DP v1.2 – HBR (1, 2, 4 lanes) • HDMI v1.4a (through external Hub or cable adapter) • DP++ compatible **Note**: DP v1.2 is backward compatible with DP v1.1a

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	DP Resolution and Frame Rate Support	DP will support the following resolutions 640x480, 1280x720, 1920x1080, 1920x1200, 2560x1440, 2560x1600 and frame rates – 24, 25, 30, 50 and 60 Hz All resolutions are in progressive mode (no interlaced supported) Specifically, the following resolutions and frame rats will be supported • 640x480p60 • 1280x720p60 • 1920x1080p60 • 1920x1200p60 • 2560x1440p60 • 2560x1600p60 **Note:** resolution and refresh rate may change in situations where there is a bad link or strict limits on TDP
	HDMI Resolution and Frame Rate Support	HDMI supports the following resolution and frame rates – • 640x480p60 • 1280x720p60 • 1920x1080p60 • 1920x1200p60 • 2560x1440p60 • 2560x1600p60 **Note:** resolution and refresh rate may change in situations where there is a bad link or strict limits on TDP
	Color space support	YCbCr and RGB
	DP & HDMI Color Depth Support	The following color depths are supported 8 bits per color
	Dual display mode	The Output interface (Display Port Multi-Stream Transport, DP MST) has the ability to support dual display mode – splitting the video stream is based on external HW (with monitors that can support it, a daisy chain approach can be used to support dual display mode)
	Multiple Display Stream Support (MST)	The following dual display mode via MST is supported • 2 x (1280x720) • 2 x (1920x1080) • 2 x (1920x1200) 1920x1080 plus 1920x1200

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

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	Audio Pass-Through Support	Support for all relevant Audio formats in Support for all relevant Audio formats in Pass-Through mode as defined in the WDE specification. LPCM (uncompressed and uncompounded), 2-8 channels, 32KHz – 192KHz, up to 24 bits per sample (dependent on the number of channels)
	Independent Digital Audio Out Interface (Sink)	Support for an independent digital Audio Out sink interface, operational upon insertion of an audio peripheral, and not dependent on monitor state (On/Off/Powered-Off) • 4 x I2S Interfaces • Multiplexed with • S/PDIF Interface
	Selection of Independent Audio Out Interface	Selection of output interface (I^2S or SPDIF) and on-board audio device capabilities is configurable on a system basis through module Flash Configuration.
	AUX/DDC Channel Interface	AUX (DP) / DDC (HDMI) channel is supported. **Note:** FAUX – fast AUX (~7000Mb) is not required.
	Chosen resolution, frame rate, color space, audio capabilities	WDE will inform the host graphics of the best resolution , frame rate, color space and audio capabilities based on • Native/Supported monitor resolutions • Module Core Capabilities • Power consumption considerations • Link status(physical layer rate and other services)
	Hot Plug	Plug and Play through hot plug detection is not supported
Wireless Serial Extension (WSE) for support of USB data flow over wireless link	WGA WSE support	USB PAL (WSE) version 1.2 (June 2013)
	WSE Supported USB Ports	Single USB 2.0/3.0 Root Port
	USB Hub	Supports direct connection to an external USB Hub device. Any USB devices on the Dock device should be connected to the external USB Hub.

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

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	Port Powering	Module does not support USB device powering. Any Dock device must be self-powered or powered from an external USB Hub in the Dock Device. The module is capable of managing the powering requirements of USB devices connected to the Dock USB Hub external to the module.
	WSE Supported Devices	USB devices listed in 'Supported USB Peripherals over USB' below are supported, separately and simultaneously. It supports control, interrupt, bulk and isochronous flows based on the supported device capabilities.
	Number of USB devices supported on Dock device	At least 12 USB devices
	Number of USB Hub Tiers supported	Maximum number of Hub Tiers connected to the external Hub in the Dock device is 3. A 4th Tier will only support non Hub devices.

	Supported USB peripherals over WSE	**Device Class**	**Comment**
		HID	Supported
		Printer	Supported
		Communication Device Class (CDC)	Supported
		Mass Storage Class (MSC)	Supported
		Hub	Supported
		Audio Class	Supported
		USB Video Class (UVC)	Supported

* Wireless access point and Iternet service required. Availability if public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

Intel® Dual Band Wireless-AC 8260 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 4.2 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
	• 2.402 – 2.482 GHz

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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/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
  Note: Indonesia no support this band)

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
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
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum

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

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- 802.11n HT20(2.4GHz) : +14dBm minimum
- 802.11n HT40(2.4GHz) : +12dBm minimum
- 802.11n HT20(5GHz) : +14dBm minimum
- 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: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b, 1Mbps : -94dBm maximum 802.11b, 11Mbps : -86dBm maximum 802.11g, 6Mbps : -88dBm maximum 802.11g, 54Mbps : -74dBm maximum 802.11a, 6Mbps : -88dBm maximum 802.11a, 54Mbps : -74dBm maximum 802.11n, MCS07 : -69dBm maximum 802.11n, MCS15 : -66dBm maximum 802.11ac, 1SS, MCS-0 : -86dBm maximum 802.11ac, 1SS, MCS-9 : -61dBm maximum 802.11ac, 2SS, MCS-0 : -83dBm maximum 802.11ac, 2SS, MCS-9 : -58dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm Or Type 1630 : 2.3 x 16.0 x 30.0 mm
Weight	Type 2230 : 2.8g Or Type 1630 : 2g
Operating Voltage	3.3v +/- 9%

Temperature	Operating	14° to 158° F (−10° to 70° C)
	Non-operating	−40° to 176° F (−40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber – Radio OFF; LED White – Radio ON	

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

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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).

4.

HP Integrated Module with Bluetooth 4.0/4.1/4.2 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps BLE : 1 Mbps data rate; throughput up to 0.2 Mbps Legacy : Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy : Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
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 Legacy

Modulation	0.01% BER	0.001% BER
GFSK	-80 dBm	-70 dBm
π/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	Legacy Up to 33 ft (10 m) BLE Up to 99 ft (30 m)
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported Link Topology	Microsoft Windows Bluetooth Software
Electrical Interface Bluetooth Software Supported Security	Point to Point, Multipoint Pico Nets up to 7 slaves
	Full support of Bluetooth Security Provisions
Power Management Certifications	Microsoft Windows ACPI, and USB Bus Support
	Self-configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Security	All necessary regulatory approvals for supported countries, including:
Certifications Bluetooth Profiles Supported	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management	ETS 300 328, ETS 300 826

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Certifications		Low Voltage Directive IEC950
		UL, CSA, and CE Mark
Certifications **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] Hard Copy Cable Replacement (HCRP)[1,2] Personal Area Networking Profile (PAN)[1,2] Human Interface Device Profile (HID)[1,2] Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP) Audio Video Remote Control Profile (AVRCP)
Bluetooth V4.1/V4.2 support feature		V4.1: ESR5/6/7 compliant
		V4.2: ESR8 compliant, LE Secure Connection – Basic.

* Wireless access point and Iternet service required. Availability if public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

Environmental Data	**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)	6.06 W	6.18 W	6.04 W
Normal Operation (Long idle)	1.85 W	1.94 W	1.81 W
Sleep	0.39 W	0.42 W	0.37 W
Off	0.27 W	0.3 W	0.26 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 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

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

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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)	21 BTU/hr	21 BTU/hr	21 BTU/hr
Normal Operation (Long idle)	6 BTU/hr	7 BTU/hr	6 BTU/hr
Sleep	1 BTU/hr	1 BTU/hr	1 BTU/hr
Off	1 BTU/hr	1 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	1.5	8
Fixed Disk – Random writes	1.8	11

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??

<edit list of features as required>

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 the1ppm by weight
Cadmium greater than 20ppm by weight

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

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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/EPE (Expanded Polyethylene)		23.3 g
	PLASTIC/Polyethylene low density		14.5 g

The plastic packaging material contains at least 50% recycled content.
The corrugated paper packaging materials contains at least 70% 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)

Not all configuration components are available in all regions/countries.
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Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging:

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

End-of-life Management and Recycling

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

POWER

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Technical Specifications

HP AC Adapter 45W USB Type-C™	**Dimensions** (H x W x D)	66mm x 66mm x 28.5mm
	Input	90 to 265 VAC
		Input Efficiency
		+5V out --78.7% min at 115 VAC/230VAC +12V out—87.4% min at 115 VAC/230VAC +15V out –87.73% min at 115 VAC/230VAC
		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 5V/12V/15V
		Hold-up time 5 msec at 115 VAC input
		Output current limit <5A, Over voltage protection 7.85V@5Vout 18V@12Vout 20.5V@15Vout max automatic shutdown
	Connector	**USB TYPE C connector**
	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 4-cell Polymer Battery (40 WHr)	**Dimensions (H x W x L)**	138.15 x 58.90 x 3.81 mm 5.44 x 2.32 x 0.15 inch
	Weight **Cells/Type**	0.166 kg/0.37 lb 4-cell Lithium-Ion
	Energy	Voltage : 7.7V Amp-hour capactity Ah

Technical Specifications

Watt-hour capacity	Watt-hour capacity : 40 WHr 40 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)
Battery recharge time	System in OFF or Standby Mode <3 hours	
Fuel Gauge LED	No	
Optional travel battery available	No	

MIL-STD 810G TEST

High Temperature test*	The High Temperature test was performed in accordance with MIL-STD-810G, Method 501.5, Procedure I (Storage). This test evaluated the units' performance while it was being exposed to high temperature conditions: 71°C (160°F) nonoperational. Test cycle 24 hours; test consisted of seven cycles.
High Temperature test*	The High Temperature test was performed in accordance with MIL-STD-810G, Method 501.5, Procedure II (Operation). This test evaluated the units' performance while it was being exposed to high temperature conditions: 60°C (140°F) operational. Four hours duration.
Low Temperature test*	The Low Temperature test was performed in accordance with MIL-STD-810G, Method 502.5, Procedure I (Storage). This test evaluated the unit's performance while it was being exposed to low temperature conditions: -51°C (-60°F) nonoperational. Four hours duration.
Low Temperature test*	The Low Temperature test was performed in accordance with MIL-STD-810G, Method 502.5, Procedure II (Operation). This test evaluated the unit's performance while it was being exposed to low temperature conditions: -29°C (20°F) operational. Four hour duration.
Thermal Shock test*	The Thermal Shock test was performed in accordance with MIL-STD-810G, Method 503.5, Procedure I. The objective of this test was to determine whether the unit could be safely operated after being exposed to sudden changes in ambient temperature while non-operational. The high temperature was set to be 96°C (205°F) and the low temperature to be -51°C (-60°F); three high-to-low cycles were performed.
Altitude*	The Altitude test was performed in accordance with MIL-STD-810G, Method 500.5, Procedure I (Storage) and II (Operation).

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Technical Specifications

	The altitude level simulated for both procedures was 15,000 feet at 57kPa.Four hour duration.
Humidity*	The humidity test was performed in accordance with MIL-STD-810G, Method 507.5, Procedure II. Relative humidity 95%. Temperature cycled between 86oF and 140oF.Test cycle 24 hours; test consisted of ten cycles.
Drop*	The drop test was performed in accordance with MIL-STD-810G, Method 516.6, Procedure IV. The objective of this test was to determine whether the unit was operational after being dropped from desk height. For this test, 26 drops were performed from 3ft onto every side, angle and edge onto 2" of plywood over steel over concrete.
Dust*	The dust test was performed in accordance with MIL-STD-810G, Method 510.5, Procedure I. Test parameters were set so that the unit was dusted with Arizona Road Dust for six hours while being operated. Each cycle was one day (24 hours); ten cycles with the temperature being cycled between 30°C (86°F) and 60°C (140°F); and relative humidity was a constant 95%.
Vibration*	The vibration test was performed in accordance with MIL-STD-810G, Method 514.6, Procedure I category 4. This test evaluated the units performance after it has been subjected to higher levels of vibration while in storage: Operational U.S. highway truck exposure, 1000 mile Simulation and One hour/axis duration.
Vibration 2*	The vibration test was performed in accordance with MIL-STD-810G, Method 514.6, Procedure I category 24. This test evaluated the units performance after it has been subjected to higher levels of vibration while in storage: Non-operational 0.04 g2/Hz at 20-1000 Hz, -6 dB/octave at 1000-2000 Hz and One hour/axis duration.
Shock*	The shock test was performed in accordance with IL-STD-810G, Method 516.6.5, Procedure I. This test objective was to determine whether the unit could be safely operated after being exposed to sudden physical shock events while operational. For this test, 3 shocks were performed across each axis and direction for a total of 18 shocks -40Gs peak, 11ms.
Freeze/Thaw test*	The Freeze/Thaw test was performed in accordance with MIL-STD-810G, Method 524.54 Procedure III. The objective of this test was to determine whether the unit could be safely operated after being exposed to a temperature drop of -10°C (14°F) for two hours. Unit is removed and checked for operation.
Sand test*	The Sand test was performed in accordance with MIL-STD-810G, Method 510.5 Procedure II
Explosive Atmosphere*	The Explosive Atmosphere test was performed in accordance with MIL-STD 810G, Method 511.5 Procedure I.

Technical Specifications

*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.

COUNTRY OF ORIGIN

China

CLEANING

The following cleaning solutions, if used as instructed in the user guide, will not harm the HP Elite x2 1012 G1:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration (for example, disposable wipes, which come in a variety of brands)
- Alcohol-free glass-cleaning fluid
- Solution of mild soap and water
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

Please refer to the user guide that came with your product for detailed instructions about how to clean your HP Elite x2 1012 G1 using these solutions.

The following cleaning solutions, if used as instructed in the user guide, will not harm the surface of HP Elite x2 1012 Travel Keyboard and the HP Elite x2 1012 Advanced Keyboard:

Surface side of the keyboards:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration (for example, disposable wipes, which come in a variety of brands)
- Alcohol-free glass-cleaning fluid
- Solution of mild soap and water
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

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Technical Specifications

Fabric side of the keyboards:

- Solution of mild soap and water
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

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

Type	Description	Part number
Carrying Cases	HP Elite Top Load Colombian Leather Case	T9H72AA
	HP Elite Top Load Herringbone Nylon Case	T9H73AA
	HP Business Slim Top Load (up to 14.1" x .75" thick)	H5M90AA
	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 UltraSlim Tablet Sling	F7Z97AA
	HP Essential Top Load Case (up to 15.6")	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP x2 1012 Protective Case	T3P15AA
Input/Output Devices	HP Active Pen with Bluetooth App Launch Button	T4Z24AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP 3-Button Laser Mouse	H4B81AA
	HP Ultrathin Wireless Mouse	L9V78AA
	HP 2.4 GHz Wireless Mouse	L0Z84AA
	HP Conferencing Keyboard	K8P74AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB 3.5mm Headset	T1A67AA
	HP Speaker Phone	K7V16AA
	HP Wired Headset	K7V17AA
	HP H2310 Black In-ear headset	J8H42AA
Adapters	HP USB Graphics Adapter	NL571AA
	HP USB Type-C™ to VGA Adapter	N9K76AA
	HP USB Type-C™ to HDMI Adapter	N9K77AA
	HP USB Type-C™ to DisplayPort Adapter	N9K78AA
	HP USB 3.0 to Gigabit LAN adapter	N7P47AA
	HP USB-C™ to USB 3.0 adapter	N2Z63AA
	HP USB-C™ to HP USB-C to 4.5mm + 3.0mm Combo DC Jack adapter	N2Z65AA
	HP Wireless display Adapter	J1V25AA
	HP USB-C™ to RJ45	V7W66AA
	HP USB-C™ Travel Dock	T0K294AA
Keyboards	HP Elite x2 1012 G1 Travel Keyboard	T4Z25AA
	HP Elite x2 1012 Advanced Keyboard	P5Q65AA
	USB Stylish Keyboard & Mouse Bundle	H4B80AA
	HP Conferencing Keyboard	K8P74AA
	HP Wireless keyboard and mouse	G1K29AA
Docking Stations/Replicators	HP Advanced Wireless Docking Station*	F7M97AA

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

	*HP Advanced Wireless Docking is compatible with the HP Elite x2 1012 G1 with an optional installed Intel Tri Band Wireless AC with WiGig Combo card available at the time of purchase.	
	HP Elite USB-C Docking Station	T3V74AA
	HP Elite 65W Thunderbolt 3 Dock	P5Q54AA
	HP USB-A 3.1 Port Replicator	H1L08AA
	HP 3005pr USB 3 Port Replicator	H1L08AA
Power Adapters	HP 45W USB Type-C™ AC Adapter	V5Y26AA
	HP Mobile Hot Spot	M5T50AA
Storage	HP External USB Optical Drive	F2B56AA
Security	HP Tablet Master Cable Lock	T8X45AA
Others	HP Tablet Cleaning Kit	K6F99AA

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Summary of Changes

Date of change:	Version History:	Description of change:
12/08/2015	From v1 to v2	Multiple edits
12/09/2015	From v2 to v3	Multiple edits
12/16/2015	From v3 to v4	Added BrightView and WUXGA to display specs.
01/20/2016	From v4 to v5	Removed HP USB-C to RJ45/USB3/USB-C Adapter and Display support.
02/11/2016	From v5 to v6	Added disclamer under "HP Advanced Wireless Docking Station".
02/19/2016	From v6 to v7	Added environmental specs
03/01/2016	From v7 to v8	Multiple edits
03/04/2016	From v8 to v9	Added Fanless design for a quiet computing experience to at a glance.
03/09/2016	From v9 to v10	Added AC adpter weight. Edit to At-a-Glance section.
03/21/2016	From v10 to v11	Option Update
03/22/2016	From v11 to v12	Edit to Storage
04/21/2016	From v12 to v13	Added USB addapters
05/25/2016	From v13 to v14	Added port note