

Overview

HP ProBook x360 11 G7 Education Edition



Left

- | | |
|--|---|
| 1. Webcam LED | 6. World-facing Webcam LED (optional) |
| 2. 720p Webcam | 7. Power button |
| 3. Microphone | 8. Headphone/Microphone combo jack |
| 4. Clickpad | 9. SuperSpeed USB Type-A 5 Gbps signaling rate port |
| 5. World-facing 5 Megapixels Webcam (optional) | 10. Nano Security lock slot (Lock sold separately) |

Overview



Right

- | | |
|--------------------------------------|--|
| 1. Power connector | 4. SuperSpeed USB Type-A 5 Gbps signaling rate port |
| 2. Ethernet (RJ-45) port | 5. SuperSpeed USB Type-C® 5 Gbps signaling rate port |
| 3. HDMI port (Cable sold separately) | |

Overview

At a Glance

- Starting at 3.15 lbs (1.43 kg)
- At 21.2mm (0.83"?) thin at front, this flexible 360° hinge converts to laptop, tablet, tent, stand or book mode easily
- Undergoes MIL-STD 810H ¹
- Rugged features such as co-molded rubber trim, spill- and pick-resistant keyboard, and Corning® Gorilla® Glass 3 touch screen
- Optional world-facing camera for project-based learning
- Optional HP Pro Pen engineered with durable tips for every classroom - durable tips require less replacing
- Pre-installed with Windows 10 Pro 64, Windows 10 Pro 64 (National Academic), FreeDOS, Windows 10 Home 64, or Windows 10 Pro in S mode 64
- Powered by Intel® Celeron® N4500, Intel® Celeron® N5100 or Intel® Pentium® N6000 processors
- Choice of 29.5cm (11.6") diagonal HD UWVA slim LED touch screen (1366 x 768) or 29.4 cm (11.6") diagonal HD SVA slim LED touch screen (1366 x 768) displays
- 64 GB eMMC or up to 256 GB PCIe® NVMe™ Solid State Drive storage options
- Up to 8 GB LPDDR4X system memory for enhanced memory management
- Reliable WLAN connectivity for learning and collaboration beyond the classroom
- Built-in ports include: Ethernet (RJ-45), USB A, USB Type-C® and HDMI 1.4b port for connecting to high-resolution displays
- Enhanced security with TPM 2.0 discrete chip
- Battery life up to ~~TBD~~11 hours 30 minutes

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

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

Technical Specifications

PRODUCT NAME

HP ProBook x360 11 G7 Education Edition

OPERATING SYSTEMS

Preinstalled	Windows 10 Pro 64 - HP recommends Windows 10 Pro for business ¹ Windows 10 Pro 64 (National Academic only) ² Windows 10 Home 64 ¹ Windows 10 Home Single Language 64 ¹ Windows 10 Pro in S mode 64 ^{2,3} Windows 10 Pro in S mode 64 (National Academic only) ^{2,3} Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement) ¹ FreeDOS
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1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.
2. Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see <https://aka.ms/ProEducation> for Windows 10 Pro Education feature information.
3. Windows 10 Pro in S mode 64 works exclusively with apps from the Windows store. Some accessories and apps compatible with Windows 10 may not work, and performance may vary. Certain default settings, features, and apps cannot be changed. Easily switch to Windows 10 Pro configuration (fee applies) Learn more at Microsoft.com/Windows10S.

NOTE: HP tested Windows 10, version 1909 on this platform. For testing information on newer versions of Windows 10, please see <https://support.hp.com/document/c05195282>

PROCESSORS

- Intel®? Pentium®? Silver N6000 (up to 3.3 GHz burst frequency, 4 MB L3 cache, 4 cores) ^{4,5,6}
- Intel®? Celeron®? N4500 (up to 2.8 GHz burst frequency, 4 MB L3 cache, 2 cores) ^{4,5,6}
- Intel® Celeron® N5100 (up to 2.80 GHz burst frequency, 4 MB L3 cache, 4 cores) ^{4,5,6}

Processor Family
Intel® Celeron® processor (N4500, N5100) ⁷
Intel® Pentium® processor (N6000) ⁷

4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
5. Multicore 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. AMD's numbering is not a measurement of clock speed.
6. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>.

CHIPSET

Technical Specifications

Chipset is integrated with processor

GRAPHICS

Integrated
Intel® UHD Graphics ⁷

Supports
Support HD decode, DX12, HDMI 1.4b⁸

7. HD content required to view HD images.

8. HDMI cable sold separately.

DISPLAY

Touch
29.5 cm (11.6") diagonal HD SVA eDP WLED-backlit touch screen with HD camera, 220 nits, 45% NTSC (1366 x 768) ^{7,9,10}
29.5 cm (11.6") diagonal HD UWVA eDP WLED-backlit touch screen with HD camera, 220 nits, 50% NTSC (1366 x 768) ^{7,9,10}

7. HD content required to view HD images.
9. Resolutions are dependent upon monitor capability, and resolution and color depth settings.
10. Actual brightness will be lower with touchscreen

STORAGE AND DRIVES

Primary M.2 Storage
Up to 256 GB PCIe® NVMe™ Value Solid State Drive ¹¹
Up to 128 GB PCIe® M.2 Value Solid State Drive ¹¹

eMMC Configurations
64 GB eMMC¹²

11. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.
12. For storage drives, GB = 1 billion bytes. Actual formatted capacity is less. Up to 6.8 GB is not user available.

MEMORY

Technical Specifications

Maximum Memory

8 GB LPDDR4X- 2933 SDRAM (on-board) ¹³

Memory

4 GB LPDDR4X- 2933 SDRAM (on-board) ¹³

8 GB LPDDR4X- 2933 SDRAM (on-board) ¹³

Memory Slots

On board LPDDR4X; system runs at 2933MHz

13. All slots are non-accessible / non-upgradeable.

NETWORKING/COMMUNICATIONS

WLAN

Intel® Dual Band Wi-Fi 6 AX201 802.11a/b/g/n/ac/ax (2x2) WLAN and Bluetooth® 5 Combo, non-vPro® ¹⁵

Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) WLAN and Bluetooth® 5 Combo, non-vPro® ¹⁶

Miracast

Native Miracast Support¹⁷

Ethernet

Realtek RTL8111HSH-CG 10/100/1000 GbE NIC ¹⁸

15. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 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 802.11ax WLAN devices. Only available in countries where 802.11ax is supported.

16. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.

17. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming

18. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO/MULTIMEDIA

Audio

Integrated dual array microphone

2 Integrated stereo speakers

HP HD Audio

Speaker Power

2W/2ohm per speaker

Camera

720p HD camera ^{7,19}

World-facing 5 MP camera (Optional) ^{7,19}

7. HD content required to view HD images.

19. Sold separately or as an optional feature.

Technical Specifications

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard

Full-sized keyboard, pick proof and spill-resistant²⁰

Pointing Device

Clickpad with multi-touch gesture support, taps enabled as default

Function Keys

- F1 - Blank
- F2 - Blank
- F3 - Sleep
- F4 - Display Switching
- F5 - Audio Mute/Unmute
- F6 - Volume <down>
- F7 - Volume <up>
- F8 - Mic Mute/Unmute
- F9 - Brightness <down>
- F10 - Brightness <up>
- F11 - Blank
- F12 - Wireless On/Off

Optional Pen

HP Pro Pen²¹

20. Keyboards are made from up to 65% post-consumer recycled plastic.

21. Sold separately or as an optional feature.

SOFTWARE AND SECURITY

Preinstalled Software

BIOS

- HP BIOSphere Gen6 ²²
- HP Drive Lock & Automatic Drive Lock
- BIOS Update via Network
- HP Secure Erase ²³
- Absolute Persistence Module ²⁴
- HP LAN-Wireless Protection
- USB enable/disable (via BIOS)

Software

- HP Connection Optimizer ²⁵
- HP Hotkey Support
- myHP
- HP Classroom Manager
- FluidMath
- Bulb Digital Portfolio ⁴⁰
- HP Prime Graphing Calculator Pro
- Kortext e-Library
- HP Interactive Light
- HP Easy Clean ³⁹
- Touchpoint Customizer for Commercial

- HP Notifications
- HP WorkWell

Technical Specifications

HP Privacy Settings
 HP Wireless Button Driver
 HP Power Manager
 HP PC Hardware Diagnostics Windows
 Microsoft Defender ²⁶
 Buy Microsoft Office (Sold separately)

Manageability Features

HP Driver Packs (download) ²⁷
 HP Manageability Integration Kit Gen4 (download) ²⁸
 HP System Software Manager (SSM) (download)
 HP Client Catalog (download)
 HP Client Management Script Library (download)
 HP Image Assistant (download)

Security Management

Pre-boot Authentication
 USB enable/disable (via BIOS)
 Power-on password (via BIOS)
 Setup password (via BIOS)
 Support for chassis padlocks and cable lock devices
 HP Sure Sense ²⁹
 TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)(FIPS 140-2 Level 2 Certified)

22. HP BIOSphere Gen6 requires Windows 10 and is available on select HP Pro and Elite PCs. Features may vary depending on the platform and configurations.

23. HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.

24. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit:

<https://www.absolute.com/about/legal/agreements/absolute/>

25. HP Connection Optimizer requires Windows 10.

26. Microsoft Defender Opt in and internet connection required for updates.

27. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.

28. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

29. HP Sure Sense is available on select HP PCs and is not available with Windows10 Home.

39. HP Easy Clean requires Windows and will disable the keyboard, display and touchpad only. Ports are not disabled.

40. Bulb Digital Portfolio includes full version 6-month trial. After 6 months, number of published pages is limited to 10 and storage to 2GB. To retain full functionality, subscription required prior to the end of the 6-month trial period.

POWER

Technical Specifications

Power Supply

- HP Smart 45 W External AC power adapter ³⁰
- HP Smart 45 W USB Type-C adapter ³⁰
- HP Smart 65 W EM External AC power adapter ³⁰

Power Cord

- 2-wire plug - 1m ³⁰
- 3-wire plug - 1m ³⁰

Primary Battery

HP Long Life 3-cell, 48 Wh Li-ion ^{31,32}

Battery life

Up to ~~TBD~~ 11 hours and ~~TBD~~ 30 minutes³³

30. Availability may vary by country.
31. Battery is internal and not replaceable by customer. Serviceable by warranty.
32. Actual battery Watt-hours (Wh) will vary from design capacity. Battery capacity will naturally decrease with shelf life, time, usage, environment, temperature, system configuration, loaded apps, features, power management settings and other factors.
33. Windows 10 MM18 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

Product Weight³⁴

- Starting at 3.15 lbs
- Starting at 1.43 kg

Product Dimensions

- 11.81 x 8.07 x 0.83 in
- 30 x 20.5 x 2.12 cm

34. Weight will vary by configuration. Does not include power adapter.

PORTS/SLOTS

- 2 SuperSpeed USB Type-A 5Gbps signaling rate
- 1 SuperSpeed USB Type-C® 5Gbps signaling rate (USB Power Delivery, Alt-mode DisplayPort™ 1.2)
- 1 HDMI 1.4b ³⁵
- 1 AC power
- 1 RJ-45
- 1 Headphone/microphone combo jack

35. HDMI cable sold separately.

SERVICE AND SUPPORT

Technical Specifications

1-year warranty and ~~90-day~~90-day software limited warranty options depending on country. Batteries have a default ~~one-year~~one-year limited warranty. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. 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>.³⁶

36. HP Care Packs are sold separately. 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 <http://www.hp.com/go/cpc>. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	19.5V
	Average Operating Power	Win 10
	Integrated graphics	Yes
	Discrete Graphics	N/A
	Max Operating Power	UMA < 45W
Temperature	Operating	32° to 95° F (0° to 35° C)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	Operating	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	Operating	40 G, 2 ms, half-sine
	Non-operating	240 G, 2 ms, half-sine
Random Vibration	Operating	0.75 grms
	Non-operating	1.50 grms
Altitude (unpressurized)	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
Planned Industry Standard Certifications	UL	YES
	CSA	YES
	FCC Compliance	YES
	ENERGY STAR®	YES ³⁷
	EPEAT	EPEAT® Gold in United States ³⁸
	ICES	YES
	Australia /	YES
	NZ A-Tick Compliance	YES
	CCC	YES

Technical Specifications

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

37. Configurations of the HP ProBook x360 11 G7 is ENERGY STAR® qualified are identified as HP ProBook x360 11 G7 ENERGY STAR on HP websites and on <http://www.energystar.gov>.

38. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit www.epeat.net for more information.

DISPLAYS

1. Actual brightness will be lower with touchscreen or Sure View.

NOTE: All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

Panel LCD 11.6 HD AG WLED	Outline Dimensions (W x H x D)	278.5 x 168.5 mm(max)
SVA 45%cg 220nits eDP Slim	Active Area	256.125 x 144 mm
	Weight	210g max
	Diagonal Size	11.6 (inch)
	Thickness	3.0 mm (max)
	Interface	eDP1.2
	Surface Treatment	BrightView glass
	Touch Enabled	Yes
	Contrast Ratio	400:1 (typical)
	Refresh Rate	60Hz
	Brightness ¹	220 nit typical (panel only)
	Pixel Resolution	1366x768 (HD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	45%
	Color Depth	6 bits
	Viewing Angle	SVA 45/45/15/35

Technical Specifications

Panel LCD 11.6 inch HD AG WLED UWVA 50percent cg 220nits eDP slim	Outline Dimensions (W x H x D)	278.5 x 168.5 mm(max)
	Active Area	256.125 x 144 mm
	Weight	200g max
	Diagonal Size	11.6 (inch)
	Thickness	3.2 mm max
	Interface	eDP1.2
	Surface Treatment	BrightView Glass
	Touch Enabled	Yes
	Contrast Ratio	800:1 (typical)
	Refresh Rate	60Hz
	Brightness¹	220 nit typical (panel only)
	Pixel Resolution	1366x768 (HD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	50%
	Color Depth	6 bits
	Viewing Angle	UWVA 85/85/85/85

STORAGE AND DRIVES

SSD 128GB 2280 PCIe-3x2 Three Layer Cell	Form Factor	M.2 2280
	Capacity	128GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	PCIe NVMe Gen3X4 or Gen3X2
	Maximum Sequential Read	Up To 2047 MB/s
	Maximum Sequential Write	Up To 1200 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	ATA Security; TRIM; L1.2

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

Technical Specifications

SSD 256GB 2280 PCIe NVMe Value Solid State Drive	Form Factor	2280
	Capacity	256GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X4
	Maximum Sequential Read	Up To 1700 MB/s
	Maximum Sequential Write	Up To 600 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

NETWORKING/COMMUNICATIONS

Intel® 9260 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5.0 Combo ¹ (Non-vPro)	Wireless LAN Standards	IEEE 802.11a
		IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n
		IEEE 802.11ac
		IEEE 802.11d
		IEEE 802.11e
		IEEE 802.11h
		IEEE 802.11i
		IEEE 802.11k
		IEEE 802.11r
		IEEE 802.11v
	Interoperability	Wi-Fi CERTIFIED modules
	Frequency Band	802.11b/g/n
		• 2.402 - 2.482 GHz
		802.11a/n/ac
		• 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
		• 802.11b: 1, 2, 5.5, 11 Mbps
		• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	Data Rates	• 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, 80MHz & 160MHz)
		Direct Sequence Spread Spectrum
		BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
		• IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only
		• AES-CCMP: 128 bit in hardware
	Modulation	
	Security ²	

Technical Specifications

	<ul style="list-style-type: none">• 802.1x authentication• WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.• WPA2 certification• IEEE 802.11i• WAPI
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power ³	<ul style="list-style-type: none">• 802.11b: +18.5dBm minimum• 802.11g: +17.5dBm minimum• 802.11a: +18.5dBm minimum• 802.11n HT20(2.4GHz): +15.5dBm minimum• 802.11n HT40(2.4GHz): +14.5dBm minimum• 802.11n HT20(5GHz): +15.5dBm minimum• 802.11n HT40(5GHz): +14.5dBm minimum• 802.11ac VHT80(5GHz): +11.5dBm minimum• 802.11ac VHT160(5GHz): +11.5dBm minimum
Power Consumption	<ul style="list-style-type: none">• Transmit mode: 2.0 W• Receive mode: 1.6 W• Idle mode (PSP) 180 mW (WLAN Associated)• Idle mode: 50 mW (WLAN unassociated)• Connected Standby/Modern Standby: 10mW• Radio disabled: 8 mW
Power Management	50
Receiver Sensitivity ⁴	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0: -84dBm maximum 802.11ac, MCS9: -59dBm 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 with CNVi Interface
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8g 2. Type 126: 1.3g
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

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology

Technical Specifications

	Bluetooth Specification	4.0/4.1/4.2/5.0 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.
<p>1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.</p> <p>2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.</p> <p>3. Check latest software/driver release for updates on supported security features.</p> <p>4. 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).</p>		
Intel® Wi-Fi 6 AX200 + Bluetooth® 5 (802.11ax 2x2, supporting gigabit data rate) (non-vPro) ^{1,5}	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Features Wi-Fi 6 technology
	Frequency Band	802.11b/g/n/ax <ul style="list-style-type: none">• 2.402 - 2.482 GHz 802.11a/n/ac/ax <ul style="list-style-type: none">• 4.9 - 4.95 GHz (Japan)• 5.15 - 5.25 GHz• 5.25 - 5.35 GHz• 5.47 - 5.725 GHz• 5.825 - 5.850 GHz
	Data Rates	<ul style="list-style-type: none">• 802.11b: 1, 2, 5.5, 11 Mbps• 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps• 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)• 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)• 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, ,80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM

Technical Specifications

Security ¹	<ul style="list-style-type: none">• IEEE 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• 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	<ul style="list-style-type: none">• 802.11b: +18.5dBm minimum• 802.11g: +17.5dBm minimum• 802.11a: +18.5dBm minimum• 802.11n HT20(2.4GHz): +15.5dBm minimum• 802.11n HT40(2.4GHz): +14.5dBm minimum• 802.11n HT20(5GHz): +15.5dBm minimum• 802.11n HT40(5GHz): +14.5dBm minimum• 802.11ac VHT80(5GHz): +11.5dBm minimum• 802.11ac VHT160(5GHz): +11.5dBm minimum• 802.11ax HT40(2.4GHz): +10dBm minimum• 802.11ax VHT160(5GHz): +10dBm minimum"
Power Consumption	<ul style="list-style-type: none">• Transmit mode2.0 W• Receive mode1.6 W• Idle mode (PSP)180 mW(WLAN Associated)• Idle mode50 mW (WLAN unassociated)• Connected Standby 10mW• Radio disabled8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity ³	<ul style="list-style-type: none">• 802.11b, 1Mbps: -93.5dBm maximum• 802.11b, 11Mbps: -84dBm maximum• 802.11a/g, 6Mbps: -86dBm maximum• 802.11a/g, 54Mbp : -72dBm maximum• 802.11n, MCS07: -67dBm maximum• 802.11n, MCS15: -64dBm maximum• 802.11ac, MCS0: -84dBm maximum• 802.11ac, MCS9: -59dBm maximum• 802.11ax, MCS11(HT40): -59dBm maximum• 802.11ax, MCS11(VHT160): -58.5dBm 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 with CNVi Interface
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8g 2. Type 126: 1.3g
Operating Voltage	3.3v +/- 9%

Technical Specifications

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

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1 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 + 9.5 dBm for BR and EDR.

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft 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 802.11ax devices. Only available in countries where 802.11ax is supported.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. 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).
5. Wi-Fi 5 or 6 is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

POWER

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions (H x W x D)	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)
	Weight ¹	0.386 lb (175g) max
	Input	90 to 265 VAC
		Input Efficiency 87.74% at 115Vac and 88.4% at 230Vac
	Output	Input frequency range 47 to 63 Hz
		Input AC current 1.4 A at 90 VAC
		Output power 45W
		DC output 19.5V
		Hold-up time 5 msec at 115 VAC input
		Output current limit <8.0A
	Connector	4.5mm Barrel Type
	Environmental Design	Operating temperature 32°F to 95°F (0°to 35°C)
		Non-operating (storage) temperature -4°F to 185°F (-20°to 85°C)
		Altitude 0 to 16,400 ft (0 to 5000m)
		Humidity 20% to 95%

Technical Specifications

	Storage Humidity	10% to 95%
EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

1. Not including power cord. Power cord varies by country

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m 2prong	Dimensions (H x W x D)	95 x 45 x 26.8mm	
	Weight¹	unit: 200g +/- 10g	
	Input	Input Efficiency	87.74 % at 115 Vac and 88.4 % at 230Vac
		Input frequency range	47 ~ 63 Hz
	Output	Input AC current	Max. 1.4 A at 90 Vac
		Output power	45W
		DC output	19.5V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0 A
	Connector	4.5mm Barrel Type	
	Environmental Design	Operating temperature	32oF to 95oF (0oto 35oC)
		Non-operating (storage) temperature	-4oF to 185oF (-20oto 85oC)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

1. Not including power cord. Power cord varies by country

Technical Specifications

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM	Dimensions (H x W x D)		102x55x30mm
	Weight ¹		270g +/- 10g
	Input	Input Efficiency	88.0 % at 115 Vac and 89.0 % at 230Vac
		Input frequency range	47 to 63 Hz
	Output	Input AC current	Max. 1.7 A at 90 Vac
		Output power	65W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11.0A
	Connector	4.5 mm Barrel Type	
	Environmental Design	Operating temperature	32°F to 95°F (0°to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20°to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

1. Not including power cord. Power cord varies by country

AC Adapter 45 Watt nPFC Standard USB Type-C® Straight 1.8m	Dimensions (H x W x D)		94.0 x 40.0 x 26.5 mm
	Weight ¹		192.5g +/-10%
	Input	Input Efficiency	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V: 81.5% 9V: 86.7% 12V: 87.41% 15V: 87.8%
		Input frequency range	47 ~ 63Hz
	Output	Input AC current	Max. 1.4 A at 90 Vac
		Output Power	5V/15W 9V/27W 12V/36W 15V/45W
		DC output	5V/9V/12V/15V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<5.0A
	Connector	USB Type-C	
	Environmental Design	Operating temperature	32°F to 95°F (0°to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20°to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	20% to 95%

Technical Specifications

EMI and Safety Certifications	Storage Humidity	10% to 95%
	CE Mark - full compliance with LVD and EMC directives	
	Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV;	
	Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.	
	MTBF - over 200,000 hours at 25°C ambient condition.	

1. Not including power cord. Power cord varies by country

HP 3-cell Long Life Li-Ion (48 Wh)	Dimensions (H x W x D)	7.3 x 94 x 184.47mm (0.287 x 3.7 x 7.263 inch)	
	Weight ¹	0.215kg	
	Cells/Type	3cell Lithium-Ion Prismatic cell / 596080	
	Energy	Voltage	11.4V
		Amp-hour capacity	4.212Ah
		Watt-hour capacity	48Wh
	Temperature	Operating (Charging)	32°F to 113°F (0°C to 45°C)
		Operating (Discharging)	14°F to 122°F (-10°C to 60°C)

1. Not including power cord. Power cord varies by country

HP 3 Cell 53 Wh Long Life - PL Fast Charge	Dimensions (H x W x D)	267.3x59.75x7.5mm
	Weight ¹	210g±10g
	Cells/Type	3cell Lithium-Ion Polymer cell / 645180
	Voltage	11.55V
	Amp-hour capacity	4590mAh
	Watt-hour capacity ¹	53Wh
	Operating (Charging)	32° to 113° F (0° to 45°C)
	Operating (Discharging)	14° to 122° F (-10°to 60°C)
	Fuel Gauge LED	NA
	Optional Travel Battery Available	No
	Optional Travel Battery Available	No

1. Not including power cord. Power cord varies by country

Country of Origin

China

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

Type	Description	Part Number
Cases	HP Prelude Pro Top Load	1X645AA
	HP Prelude Pro Backpack	1X644AA
	HP Business Backpack (17.3")	2SC67AA
	HP Business Case (15.6")	2SC66AA
	HP Business Slim Top Load (14.1")	2SC65AA
	HP 14.1 Business Sleeve	2UW01AA
	HP 13.3 Business Sleeve	2UW00AA
Docking	HP Thunderbolt Dock 120W G2	2UK37AA
	HP Thunderbolt Dock 230W G2	2UK38AA
	HP TB Dock w/ Combo Cable (230W)	3TR87AA
	HP TB Dock Audio Module	3AQ21AA
	HP TB Dock 230W G2 Cable	3XB95AA
	HP TB Dock 120W G2 cable	3XB94AA
	HP TB Dock G2 combo cable	3XB96AA
	HP USB Type-C Mini Dock	1PM64AA
	HP USB Type-C Dock G5	5TW10AA
	HP USB Type-C /A Universal Dock G2	5TW13AA
Input / Output	HP Wireless Rechargeable 950MK Mouse and Keyboard	3M165AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP Wireless Premium Keyboard	Z9N41AA
	HP USB Essential Keyboard and Mouse	H6L29AA
	HP Wireless Collaboration Keyboard	Z9N39AA
	HP 935 Creator Wireless Mouse	1D0K8AA
	HP 635 Multi-Device Wireless Mouse	1D0K2AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP X4000b Bluetooth Mouse	H3T50AA
	HP Wired Desktop 320M Mouse	9VA80AA
	HP USB Travel Mouse	G1K28AA
	HP Bluetooth Travel Mouse	6SP30AA
	HP Wireless Premium Mouse	1JR31AA
	HP USB Premium Mouse	1JR32AA
	HP Elite Presenter Mouse	2CE30AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA
	HP USB Type-C to USB-A Hub	Z6A00AA
	HP USB Type-C to DP	N9K78AA
	HP USB Type-C to VGA	N9K76AA
	HP HDMI to VGA	H4F02AA
	HP USB Type-C to HDMI 2.0 Adapter	1WC36AA
	HP USB Type-C to RJ45 Adapter	V7W66AA
	HP USB Type-C Travel Hub G2	7PJ38AA
	HP Elite USB Type-C Hub	4WX89AA

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

Power	HP 65W Slim AC Adapter	H6Y82AA
	HP 45W Smart AC Adapter	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 45W 2-prong 4.5 mm DC jack AC Adapter	L6F60AA#ABJ
	HP 45W USB-C Power Adapter	1HE07AA
	HP 65W USB-C Power Adapter	1HE08AA
	HP 65W USB Type-C Slim Power Adapter	3PN48AA
	HP Notebook Power Bank	N9F71AA
	HP USB-C Essential Power Bank	3TB55AA
Storage	HP USB External DVDRW Drive	F2B56AA
	HP 256GB PCI-e 3x4 NVMe M.2 SSD	TBT
	HP 512GB PCI-e 3x4 NVMe M.2 SSD	TBT
Security	HP Nano Keyed Cable Lock	1AJ39AA
	HP Sure Key Cable Lock	6UW42AA

Summary of changes

Date of change:	Version History:		Description of change:
	From V1 to V2		

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