



## SMART Board® RX series with iQ



**HDMI™**  
HIGH-DEFINITION MULTIMEDIA INTERFACE

Display	
Screen sizes (diagonal)	65"   75"   86"
Backlight	LED
Aspect ratio	16:9
Maximum display resolution	4K UHD (3840 × 2160)
Refresh rate	60 Hz
Lifespan	≥ 50,000 hours
Brightness <sup>1</sup>	490 cd/m <sup>2</sup>
Display response time	≤ 8 ms
Viewing angle	178°
Glass	Optically bonded   Anti-glare   Anti-fingerprint   Heat-tempered
Frame color	White
Convenience buttons	Power   Home   Volume   Microphone mute   Freeze frame
Sensors	Proximity   Ambient light   Infrared   Room temperature   Humidity   Equivalent carbon dioxide (eCO <sub>2</sub> )   Volatile organic compound (VOC)   Particulate Matter (PM <sub>2.5</sub> ) <sup>2</sup>
Audio	Integrated soundbar featuring two 20 W speakers and a 15 W subwoofer  Integrated linear eight-microphone array with visual mute status indicator and support for onboard acoustic echo cancellation

<sup>1</sup>Brightness of individual displays can vary.

<sup>2</sup>The display's environmental sensors are not life safety rated sensors: they provide general information only.



### NFC

Integrated RFID NFC reader/writer  
CCID (chip card interface device)  
when used with a native operating  
system driver for Windows®, Linux®,  
or Mac  
  
Supported protocols: ISO 14443A/B,  
ISO 15693, NFC Tag 1-4

### Interactive experience

Touch technology	HyPr Touch™ with Advanced IR
Touch features	Tool Explorer™ v2 Simultaneous tool differentiation Object Awareness™ Pen ID™ Silktouch™ Palm rejection
Typical touch response time	≤ 4 ms
Frame rate	≥ 300 Hz
Accuracy	1 mm
Minimum object size	2 mm
Multitouch capabilities	40 – Windows 32 – Android™ 20 – Mac 10 – Chrome OS™
Tools included	Stylus with multi-color select and fine eraser (×2) Erasers with angle of orientation (×2)
Tool holders	Intelligent   Magnetic   Frame-mounted
Optional tools	Stamps (available in 2024)

Software	
<b>Included</b>	iQ embedded Android OS SMART Notebook® SMART Product Drivers and SMART Ink® SMART Remote Management <sup>3</sup>
<b>Optional</b>	SMART Notebook Plus Lumio™

### iQ embedded Android OS

<b>Operating system</b>	Android version 13.0 (forward compatible)
<b>CPU</b>	Octa-core
<b>Memory</b>	8 GB DDR4
<b>OS architecture</b>	64-bit
<b>Storage</b>	64 GB (up to 576 GB)
<b>User interface</b>	4K UHD (3840 × 2160)
<b>Digital whiteboard</b>	✓
<b>Web browser</b>	✓
<b>Screen sharing</b>	✓
<b>Google Play™ Protect Certified<sup>4</sup></b>	✓
<b>Google Play Store</b>	✓
<b>Other features</b>	Personalized home screen and settings Split screen Interactive widgets Templates, graphic organizers, and manipulatives File and app libraries Environmental sensors dashboard Tool Explorer™ Image Editor
<b>Ability to run third-party applications</b>	✓
<b>Cloud storage access</b>	✓
<b>NFC sign in to a SMART Account</b>	✓
<b>Device-based sign in to a SMART Account</b>	✓

<sup>3</sup>Subscription for the length of the included warranty

<sup>4</sup>Pending final testing

### Languages supported

Basque | Catalan/Valencian | Chinese (simplified) | Chinese (traditional) | Czech | Danish | Dutch | English | Estonian | Finnish | French | Galician | German | Greek | Hungarian | Italian | Japanese | Korean | Latvian | Lithuanian | Norwegian | Polish | Portuguese | Romanian | Russian | Slovak | Slovenian | Spanish | Swedish | Ukrainian | Vietnamese | Welsh

### Updates

Automatic over-the-air (OTA)

### PC computing

<b>OPS support<sup>5</sup></b>	SMART PCM modules
<b>PC module power supported OPS</b>	100 W
<b>Optional computing module</b>	See > <a href="https://smarttech.com/accessories">smarttech.com/accessories</a>

Inputs	Front	Back
OPS PC accessory slot	–	1
MicroSD slot with security cover	–	1
HDMI® 2.1 4K @ 60Hz with HDCP 1.4, HDCP 2.3, ARC, and eARC support <sup>6</sup>	1	3
VGA video	–	1
RS-232 (DB-9 connector)	–	1
RJ45 (LAN IN)	–	1
USB Type-C 4K @ 60Hz, Display Port 1.2, USB 2.0 (UFP) for touch and digital audio, USB 3.2 Gen 1 (DFP) for peripherals; 65 W power delivery	1	1
USB Type-C, SuperSpeed (5 Gbps); 15 W power delivery	–	1 (top)
USB 2.0 Type-A	–	1
USB 3.2 Gen 1 Type-A	2	2
USB 3.2 Gen 1 Type-B	1	3

<sup>5</sup>The support and performance of third-party OPS (Open Pluggable Specification) and OPS-C modules may vary. Conduct proper compatibility testing to avoid potential issues.

<sup>6</sup>ARC and eARC support are available only with the HDMI 2 input.

Outputs	Front	Back
HDMI 2.1 4K @ 60Hz with HDCP 2.3 support	–	1
USB Type-C 4K @ 60Hz Display Port 1.4a, HDCP 2.3 and HDCP 1.3, USB 3.2 Gen 1 (DFP) for touch ingest and peripherals; 4.5 W power delivery	–	1
Stereo 3.5 mm (variable)	–	1
S/PDIF optical (fixed)	–	1
RJ45 (LAN OUT)	–	1

Included cables and accessories	Qty
Country-specific power cable	1
16' 5" (5 m) USB 2.0 A to B cable	1
6' (1.8 m) USB 3.2 Gen 1 Type-C cable, 5A	1
Stylus with multi-color select and fine eraser	2
Bar erasers	2
External tri-band Wi-Fi (2.4, 5, and 6–7.2 GHz) and Bluetooth® (2.4 GHz) antennas	2
Remote control	1
AAA batteries	2
SMART ID cards (for NFC sign in to a SMART Account)	2
Illustrated installation instructions	1
Important information document	1

### Connectivity

<b>Wired</b>	RJ45 (x2) 1000BASE-T
<b>Wi-Fi</b>	IEEE 802.11ax (Wi-Fi 6e) supporting WPA, WPA2, WPA3 PSK, and 802.1X EAP authentication protocols
<b>Bluetooth</b>	5.2 dual mode

### Storage and operating requirements

<b>Power requirements</b>	100V to 240V AC, 50 Hz to 60 Hz
<b>Operating temperature</b>	41–95°F (5–35°C)
<b>Storage temperature</b>	–4–140°F (–20–60°C)
<b>Humidity</b>	5–80% relative humidity, non-condensing

### Power consumption

<b>Typical</b>	65": 94 W 75": 105 W 86": 122 W
<b>Standby</b>	<0.5 W

### Certification and compliance<sup>7</sup>

<b>Regulatory models</b>	IDQR65-A   IDQR75-A   IDQR86-A
<b>US / Canada</b>	FCC   ISCED   TSCA   CONEG Packaging   Proposition 65
<b>EU / EEA / EFTA / UK</b>	CE   UKCA   LVD   CB   EMC   RED   REACH   RoHS   Battery   WEEE   Packaging   POP   Ecodesign
<b>Australia / New Zealand</b>	RCM
<b>Performance standards</b>	ENERGY STAR®   HDMI   HDCP

### Purchasing information<sup>8</sup>

#### Order numbers

<b>RX265</b>	SMART Board® RX065 interactive display with iQ
<b>RX275</b>	SMART Board RX075 interactive display with iQ
<b>RX286</b>	SMART Board RX086 interactive display with iQ

### Optional accessories

<b>SWC-120UHD</b>	SMART Ultra HD Camera 120
<b>Other accessories</b>	See > <a href="https://smarttech.com/accessories">smarttech.com/accessories</a>

### SMART Warranty

Terms and conditions and warranty upgrade options vary by region. Visit [smarttech.com/warranty](https://smarttech.com/warranty) or contact your reseller for information.

<sup>7</sup>Product availability may vary by region.

This product has received additional certifications not listed here.

<sup>8</sup>Order numbers may vary by region.

### Cable requirements

See › *SMART cables and connectors guide*  
([docs.smarttech.com/kb/171926](https://docs.smarttech.com/kb/171926))





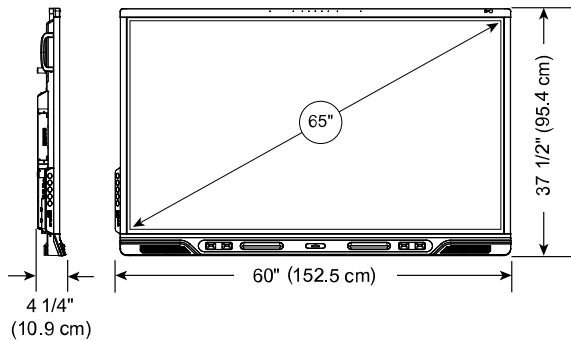
## Installation, dimensions, and weights

### Notes

- All dimensions  $\pm 1/8"$  (0.3 cm). All weights  $\pm 2$  lb. (0.9 kg).
- Product ships upright.
- Leave space around the display to ensure adequate ventilation.

### 65" models

#### Dimensions



#### Weight

92.6 lb. (42 kg)

#### Shipping dimensions (including pallet)

65 1/2"  $\times$  46"  $\times$  7 1/8"  
(166.5 cm  $\times$  117 cm  $\times$  18 cm)

#### Shipping weight

108 lb. (49 kg)

#### VESA mount

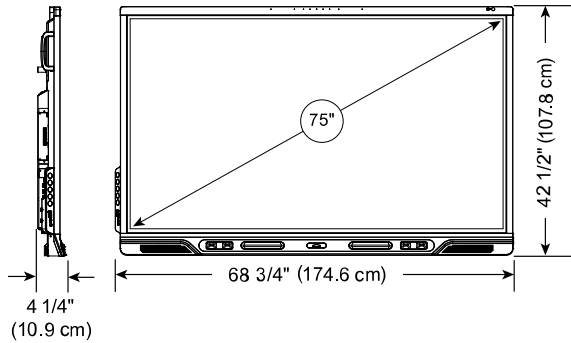
M8 | 600  $\times$  400 mm

#### Handles

2

### 75" models

#### Dimensions



#### Weight

124 lb. (56 kg)

#### Shipping dimensions (including pallet)

74 5/8"  $\times$  50 7/8"  $\times$  7 1/8"  
(189.5 cm  $\times$  129.3 cm  $\times$  18 cm)

#### Shipping weight

147 lb. (67 kg)

#### VESA mount

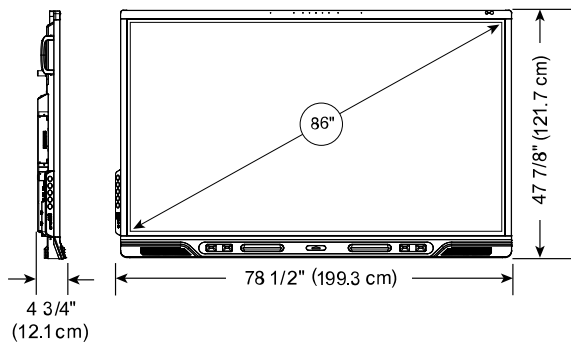
M8 | 800  $\times$  400 mm

#### Handles

2

### 86" models

#### Dimensions



#### Weight

154 lb. (70 kg)

#### Shipping dimensions (including pallet)

84 1/4"  $\times$  57 1/4"  $\times$  7 5/8"  
(214 cm  $\times$  145.4 cm  $\times$  19.5 cm)

#### Shipping weight

190 lb. (86 kg)

#### VESA mount

M8 | 800  $\times$  600 mm

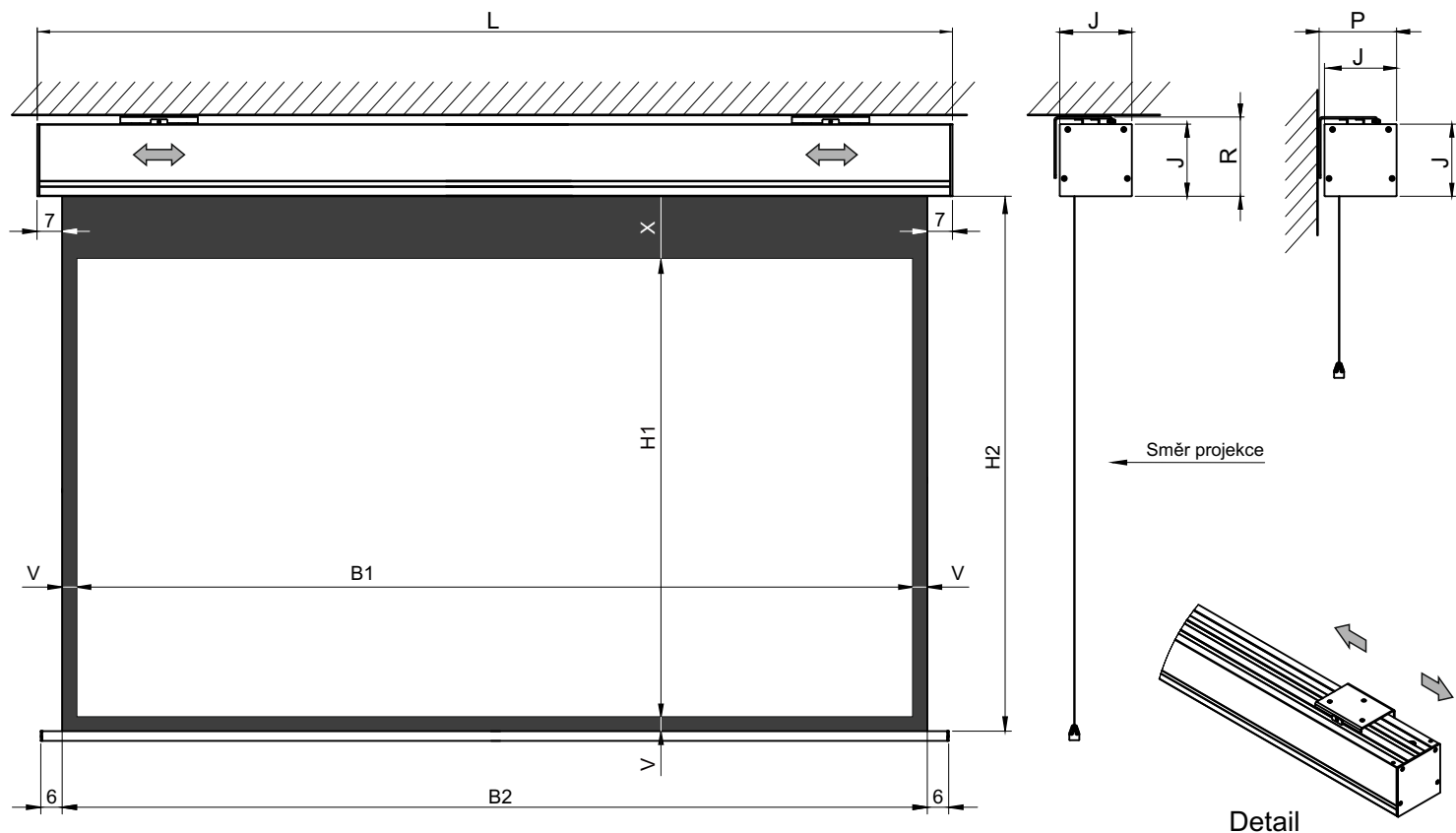
#### Handles

2

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Rozměry v cm

Modul plochy	Vnější rozměr/Rozměr obrazu v cm (š x v)	Formát	Katalogové číslo	B1	H1	Uhlopříčka	B2	H2	V	X	L	J	P	R	Hmotnost kg
200	200x200 / 200x200	1:1	303416	200	200	283	200	200	-	-	214	10.5	11.5	11.8	18
	200x150 / 200x150	4:3	303438	200	150	250	200	150	-	-	214	10.5	11.5	11.8	18
	200x152 / 192x144	4:3	303493	192	144	240	200	152	4	4	214	10.5	11.5	11.8	18
	200x142 / 192x108	16:9	303494	192	108	220	200	142	4	30	214	10.5	11.5	11.8	18
	200x154 / 192x120	16:10	303495	192	120	226	200	154	4	30	214	10.5	11.5	11.8	18
240	240x240 / 240x240	1:1	303424	240	240	339	240	240	-	-	254	10.5	11.5	11.8	24
	240x180 / 240x180	4:3	303443	240	180	300	240	180	-	-	254	10.5	11.5	11.8	24
	240x182 / 232x174	4:3	303497	232	174	290	240	182	4	4	254	10.5	11.5	11.8	24
	240x165 / 232x131	16:9	303498	232	131	266	240	165	4	30	254	10.5	11.5	11.8	24
	240x179 / 232x145	16:10	303499	232	145	274	240	179	4	30	254	10.5	11.5	11.8	24
270	270x270 / 270x270	1:1	303427	270	270	382	270	270	-	-	284	10.5	11.5	11.8	28
	270x205 / 262x197	4:3	303422	262	197	328	270	205	4	4	284	10.5	11.5	11.8	28
	270x181 / 262x147	16:9	303423	262	147	300	270	181	4	30	284	10.5	11.5	11.8	28
	270x198 / 262x164	16:10	303428	262	164	309	270	198	4	30	284	10.5	11.5	11.8	28
300	300x300 / 300x300	1:1	303430	300	300	424	300	300	-	-	314	10.5	11.5	11.8	31
	300x225 / 300x225	4:3	303449	300	225	375	300	225	-	-	314	10.5	11.5	11.8	31
	300x227 / 292x219	4:3	303432	292	219	365	300	227	4	4	314	10.5	11.5	11.8	31
	300x198 / 292x164	16:9	303433	292	164	335	300	198	4	30	314	10.5	11.5	11.8	31
	300x217 / 292x183	16:10	303434	292	183	345	300	217	4	30	314	10.5	11.5	11.8	31
330	330x250 / 322x242	4:3	303542	322	242	403	330	250	4	4	344	13	14	15.2	37
	330x215 / 322x181	16:9	303543	322	181	369	330	215	4	30	344	13	14	15.2	37
	330x235 / 322x201	16:10	303544	322	201	380	330	235	4	30	344	13	14	15.2	37
350	350x265 / 342x257	4:3	303552	342	257	428	350	265	4	4	364	13	14	15.2	39
	350x226 / 342x192	16:9	303553	342	192	392	350	226	4	30	364	13	14	15.2	39
	350x248 / 342x214	16:10	303554	342	214	403	350	248	4	30	364	13	14	15.2	39
400	400x300 / 400x300	4:3	303569	400	300	500	400	300	-	-	414	13	14	15.2	42
	400x250 / 400x250	16:10	303570	400	250	472	400	250	-	-	414	13	14	15.2	42
	400x302 / 392x294	4:3	303572	392	294	490	400	302	4	4	414	13	14	15.2	42
	400x254 / 392x220	16:9	303573	392	220	450	400	254	4	30	414	13	14	15.2	42
	400x279 / 392x245	16:10	303574	392	245	462	400	279	4	30	414	13	14	15.2	42

## SMART Výukový software – popis funkcí

SMART VÝUKOVÝ SOFTWARE je balíček, který přináší učitelům a žákům vše potřebné:

- SMART Notebook jako aplikaci na PC.
- Lumio by SMART jako cloud prostředí dostupné odkudkoliv.
- Obě platformy obsahují i SMART lab digitální učební aktivity a SMART response 2 hlasování a testování.

- **SMART Notebook**

je software, který využívají tisíce českých učitelů při každodenní výuce, a to více než 20 let. Obsahuje nástroje pro psaní, kreslení, malování, rýsování, nástroje pro kreslení tvarů, nástroje pro matematiku včetně funkcí, grafů a geometrie. Součástí je i velká galerie obrázků (u kterých se nemusíte mít obavy z autorských práv), bezpečný vyhledávač videí na internetu, nástroj pro záznam cvičení s nahrávkou zvukového komentáře nebo myšlenkové mapy.

- **Lumio by SMART**

prostředí je dostupné přes webový prohlížeč, takže není nic potřeba instalovat na počítač. Obsahuje zjednodušené nástroje SMART Notebooku a nástroj doplnění interaktivních aktivit do souborů .pdf a .ppt. Učiteli navíc poskytuje úložný prostor pro ukládání úloh a cvičení, který je dostupný z jakéhokoliv počítače či tabletu připojeného k internetu. Učitel se tak k materiálům dostane odkudkoliv a zároveň je může jednoduše sdílet žákům.

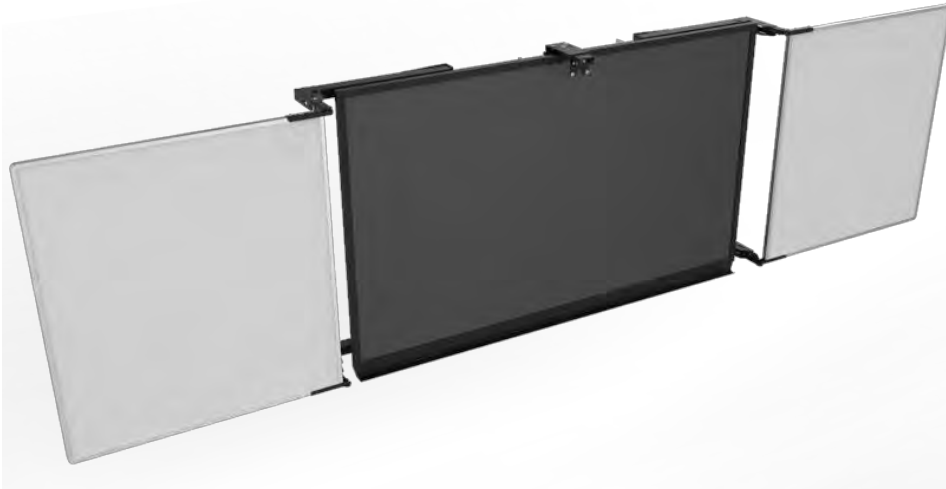
- **SMART lab**

je nástroj pro učitele i žáky, který umožňuje vytvořit interaktivní cvičení během několika minut. LAB obsahuje šablony pro otáčení karet při hledání správné odpovědi, třídění objektů, řazení objektů ve správném pořadí i pro doplňování textu do prázdných políček ve slově nebo větě. Součástí je i aplikace Zapojte se!, díky které mohou žáci sdílet své nápady, text i obrázky mobilních zařízení přímo ve SMART Notebook.

- **SMART response 2**

je systém pro hlasování a testování pomocí žákovských zařízení. Jedná se o hlasovací a odpovědní systém s jednoduchým vyhodnocením odpovědí – otázky ano/ne, výběr jedné nebo více správných odpovědí, otázka na názor nebo otázka s krátkou odpovědí. K otázkám lze doplnit obrázek. Žáci odpovídají přes internet z počítače, tabletu nebo chytrého telefonu.

Na portálu [www.veskole.cz](http://www.veskole.cz) najdete v softwaru SMART Notebook ke stažení více než 34 000 již připravených materiálů.



As digital touch panel technology enters more class-, conference and congress rooms, traditional writing surfaces are often lost to teachers and presenters.

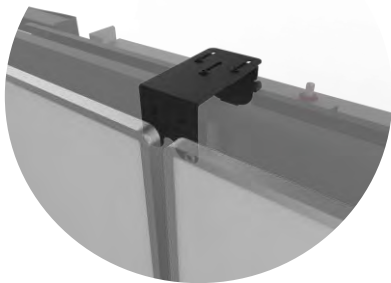
With the BalanceBox® Winx® 4b Touchscreen Whiteboard Frame you can combine touchscreen technology with the functionality of traditional whiteboards.

The Winx® 4b is one of the whiteboard solutions for the BalanceBox® 650 mounting system, next to the Winx® 4 and the Winx® 6.

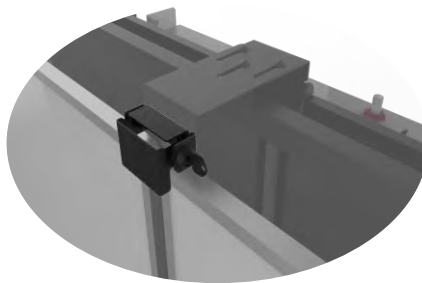
The Winx® 4b is compatible with most touch panels, in combination with our Universal VESA Bracket with a VESA pattern up to 800 x 600 (art.no. 481A70), which is included. The Winx® 4b comes in two versions, to be used with screen sizes between 70 - 75" and 80 - 86" respectively.

The high-quality enameled steel, double-sided pivoting, whiteboard surfaces are mounted easily and quickly on to the BalanceBox® 650 height adjustable mount, which makes your screen dynamic height adjustable. The whiteboard surfaces allow for the use of magnets for posting notes or attaching markers.

### Winx® 4b features:



Winx® 4b Whiteboard Stop (included)



Winx® 4b Whiteboard Lock  
(Sold separately, article number 481A80)



Winx® 4b Whiteboard Hinges  
(adjustable, 4x included)





Technical specifications

Materials & Colors	Welded steel frame, powder coated textured Black (RAL9005) Glossy white enameled steel whiteboards with anodized aluminum edging			
Safety / Certification	CE			
BalanceBox® 650 (not included)	To determine which BalanceBox® 650 you need, add the weights of your panel, the Winx® 4b frame and all accessories (for example the Winx® 4b Whiteboard Lock) together. If you need assistance, please do not hesitate to contact our sales manager in your region: <a href="http://www.heightadjustablemounts.com/contact-en">www.heightadjustablemounts.com/contact-en</a>			
Dimensions	Please check out the table below (with maximum screen sizes) for dimensions per model. Maximum VESA pattern: 800x600			
Shipping Dimensions	Length	Width	Height	
481A78001	Box size 1 unit	1125 mm   44.3"	595 mm   23.4"	240 mm   9.4"
	Bulk shipment: 8 units* per pallet (1200x1000 mm   47.2" x 39.4")	1200 mm   47.2"	1000   39.4"	1332 mm   52.4"
	Whiteboards (on separate pallet)	1045 mm   41.1"	970 mm   38.2"	50 mm   2"
481A79001	Box size 1 unit	1190 mm   46.9"	735 mm   28.9"	240 mm   9.4"
	Bulk shipment: 8 units* per pallet (1200x1000 mm   47.2" x 39.4")	1200 mm   47.2"	1000 mm   39.4"	1619 mm   63.7"
	Whiteboards (on separate pallet)	1195 mm   47"	1112 mm   43.8"	50 mm   2"
Whiteboards	2x double-sided white enameled steel with aluminum edging - Panel / screen size 70-75": 985 x 910 mm   38.8" x 35.8" - 10 kg   22 lbs - Panel / screen size 80-86": 1135 x 1052 mm   44.7" x 40.4" – 11 kg   24.3 lbs			
VESA Bracket	481A70 – Universal VESA Bracket (included)			
Accessories	481A13 – BalanceBox® 650 Floor Support 481A80 – Winx® 4b Whiteboard Lock			

Art. Number	Description	Writable surfaces	White-boards	For screen sizes between	Product weight*	Shipping weight**
481A78001	Winx-4b 75" for BalanceBox®650	4	2	70" to 75"	40 kg   88.2 lbs	48 kg   105.8 lbs
481A79001	Winx-4b 86" for BalanceBox®650	4	2	80" to 86"	43,5 kg   95.9 lbs	54 kg   119 lbs
* Product Weight includes 2 whiteboards   ** Shipping Weight includes packaging (excluding pallet)						

Maximum panel sizes

Art. Number	Diagonal	Height	Width	Depth
481A78001	70" to 75"	1095 mm   43.1"	1790 mm   70.5"	155 mm   6.1"
481A79001	80" to 86"	1242 mm   48.8"	2080 mm   81.9"	155 mm   6.1"



Universal VESA Bracket (481A70)  
included

Illustrations may differ from reality

# HDMI-4K Manager

## 4K UHD HDMI Reclocker and EDID Manager

Part No 9133 0009



HDMI-4K Manager is a multifunctional interface with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

HDMI-4K Manager features Advanced EDID Management and can emulate any HDMI display for continuous video output, even if the attached display is disconnected or powered down. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment. The EDID memories from 1 to 55 are factory preset, the memories from 62 to 98 are user programmable. EDID memories from 56 to 61 are for universal EDID presets. Memory 00 is transparent for output so using this setting the EDID of the last attached display device (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software wizard) the users can create their own EDID by completing four simple steps. Experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which can be uploaded to the user programmable memory of the HDMI-4K Manager.

HDMI-4K Manager can be rack-mounted or used standalone. The unit is equipped with the highest grade gold plated connectors to ensure reliable connection.

## Applications

- Rental and staging
- Military
- Medical
- Digital Signage
- Multiroom video
- Conference rooms, collaborative telepresence

## Features:

- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Keeps source's HDMI or DVI output continuously active
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control
- Cable loss compensation at Input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- HDCP compliant
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support



# HDMI-4K Manager

## Specifications

Data rate per TMDS channel:	3 Gbps
Max resolution:	3840 x 2400 or 4096 x 2160
Reclocking:	Yes
HDCP pass through:	Yes
Input cable equalization:	Automatic max 20m @4k30, or 30m @1080p60
Digital audio formats	Pass through. Supports up to 8 channel PCM, Dolby TrueHD and DTS-HD Master Audio 7.1 formats
Front panel control:	Yes, EDID learn button, EDID selector switch
LED indicators:	Live, Video Input Status, Audio Signal Format, Video Output Status
EDID emulation:	Yes, Advanced EDID management with 99 EDID memories
EDID memory:	55 factory preset , 6 universal, 1 transparent, 37 user programmable
EDID support:	256 byte Extended EDID
+5V Power on HDMI Outputs:	500 mA
Power:	Universal power adaptor, DC 5V 2.5A (max)
Power consumption:	1,8 W (max)
Enclosure:	1 mm metal
Dimensions:	100,4 W x 67,6 D x 26 H mm
Net weight:	250 g
Warranty:	3 years

## Connectors

Input / Output	HDMI connector / HDMI connector
Control	Mini USB-B female connector
Power	DC connector (1.35/3.5 mm)

### Optional accessory



#### Rack shelf

**Part No: 5240 0269**

The 1U high rack shelf provides mounting holes for fastening two half-rack or four quarter-rack sized units.

### Supplied accessory

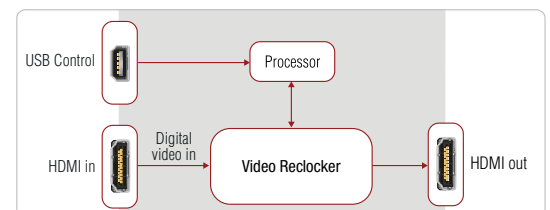


#### PSU-5VS

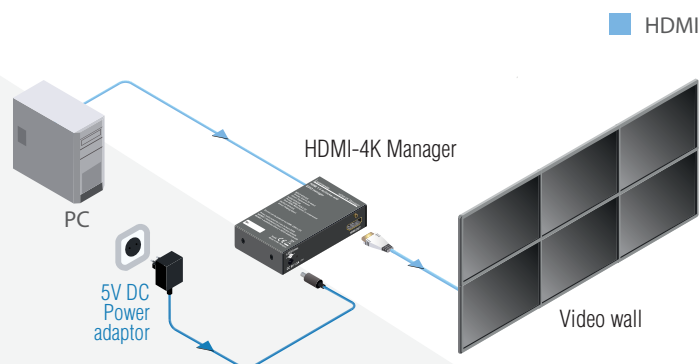
**Part No: 1180 0050**

Wall power adaptor with interchangeable plug for international use. Universal input: 100-240 V AC, 50-60 Hz, Output: 5 V DC, 2.5 A

### Port Diagram



### Standalone diagram





MPN: PROHDMIHDM0.5

## Pro HDMI Cable Metal Head 0.5m

High Performance and High Speed HDMI 2.0 18Gbit Cable with Ethernet and Metal Housing.

Supports Resolutions up to 4K@60Hz with HDCP 2.2, CEC and ARC

Ultra flexible.

- All HDMI resolutions up to 4K (4096x2160p @60Hz), including 3D video
- Support sample rate 4:4:4
- High Dynamic Range (HDR)
- Transfer speed 18 Gbit/s
- HDCP 2.2
- Supports Deep Color, up to 16-bits per channel, including x.v.Color standard
- Supports the 21:9 cinema aspect ratio
- Supports SA-CD, DVD-Audio, DTS-HD Master Audio, Dolby TrueHD, and other high definition audio standards
- Audio Return Channel
- Auto Lip Sync
- Supports up to 32 audio channels and a 1536 kHz audio sampling rate
- Dynamic sound synchronization
- Supports extended CEC (Consumer Electronics Control) commands and functions
- the HDMI Ethernet Channel, and the Audio Return Channel features
- Fully assembled with 19 pins connected
- High quality HDMI A connector, 15um gold min. in contact area for high reliability
- and professional use
- 99,9% pure copper wires for lossless picture transmission
- Triple shielded cable and extra shielding in the connector
- High Flexibility ensuring small bending radius



## Specifikace

Features	3D	Yes
	Audio Return Channel (ARC)	Yes
	AWG wire size	28
	Cable jacket material	Polyvinyl chloride (PVC)
	Cable length	0,5 m
	Cable material	Steel
	Colour depth	16 bit
	Connector 1	HDMI
	Connector 1 form factor	Straight
	Connector 1 gender	Male
	Connector 2	HDMI
	Connector 2 form factor	Straight

Features	Connector 2 gender	Male
	Connector contacts plating	Gold
	Data transfer rate	18 Gbit/s
	Dolby technologies	DTS-HD Master Audio
	HDCP	Yes
	HDCP version	2.2
	HDMI Ethernet channel	Yes
	HDMI version	2.0
	High Dynamic Range (HDR) supported	Yes
	High Dynamic Range (HDR) technology	High Dynamic Range 10 (HDR10)
	High Dynamic Range 10 (HDR10)	Yes
	Maximum refresh rate	60 Hz
	Maximum resolution	4096 x 2160 Pixels
	Plug and Play	Yes
	Product colour	Black
	Quantity per pack	1 kusů
	RoHS compliance	Yes
	Supported graphics resolutions	3840 x 2160
	Supported video modes	1080p
Operational conditions	Operating temperature (T-T)	-20 - 60 °C
Other features	Cable colour	Black
Package dimensions (verified)	Depth Verified	14,7 cm
	Gross Weight Verified	0,07 kg
	Height Verified	2,2 cm
	Width Verified	16,1 cm
Product dimensions	Net Weight (Product, kg)	0,06 kg
Vendor information	Brand Name	Vivolink
	Warranty	12 Rok (y)
Weight & dimensions	Cable diameter	7,3 mm

## Další obrázky



MPN: PROHDMIHDM12.5

## Pro HDMI Cable Metal Head 12.5m

High Performance and High Speed HDMI 2.0 18Gbit Cable with Ethernet and Metal Housing.

Supports Resolutions up to 4K@60Hz with HDCP 2.2, CEC and ARC

Ultra flexible and with Lock Spike.



Note: This cable is with HDMI lock. This is to ensures a stable and secure connection between AV equipment (e.g. AV splitters, switches or other AV distribution equipment) in fixed installations. Please add the PROHDMIHDMFM2 cable when using this cable connection with a laptop or other portable devices. This cable protects the interface in your portable device so it will not get damaged when plugging in and out several times.

- All HDMI resolutions up to 4K (4096x2160p @60Hz), including 3D video
- Support sample rate 4:4:4
- High Dynamic Range (HDR)
- Transfer speed 18 Gbit/s
- HDCP 2.2
- Supports Deep Color, up to 16-bits per channel, including x.v.Color standard
- Supports the 21:9 cinema aspect ratio
- Supports SA-CD, DVD-Audio, DTS-HD Master Audio, Dolby TrueHD, and other highde initiation audio standards
- Audio Return Channel
- Auto Lip Sync
- Supports up to 32 audio channels and a 1536 kHz audio sampling rate
- Dynamic sound synchronization
- Supports extended CEC (Consumer Electronics Control) commands and functions
- the HDMI Ethernet Channel, and the Audio Return Channel features
- Fully assembled with 19 pins connected
- High quality HDMI A connector, 15um gold min. in contact area for high reliability
- and professional use
- 99,9% pure copper wires for lossless picture transmission
- Triple shielded cable and extra shielding in the connector
- High Flexibility ensuring small bending radius

## Specifikace

Features	3D	Yes
	Audio Return Channel (ARC)	Yes
	AWG wire size	24
	Cable jacket material	Polyvinyl chloride (PVC)
	Cable length	12,5 m
	Cable material	Steel

Features	Colour depth	16 bit
	Connector 1	HDMI
	Connector 1 form factor	Straight
	Connector 1 gender	Male
	Connector 2	HDMI
	Connector 2 form factor	Straight
	Connector 2 gender	Male
	Connector contacts plating	Copper
	Data transfer rate	18 Gbit/s
	Dolby technologies	DTS-HD Master Audio
	HDCP	Yes
	HDCP version	2.2
	HDMI Ethernet channel	Yes
	HDMI version	2.0
	High Dynamic Range (HDR) supported	Yes
	High Dynamic Range (HDR) technology	High Dynamic Range 10 (HDR10)
	High Dynamic Range 10 (HDR10)	Yes
	Maximum refresh rate	60 Hz
	Maximum resolution	4096 x 2160 Pixels
	Plug and Play	Yes
	Product colour	Black
	Pull-off force	2 kg
	Quantity per pack	1 kusů
	RoHS compliance	Yes
	Supported graphics resolutions	3840 x 2160
	Supported video modes	1080p
Operational conditions	Operating temperature (T-T)	-20 - 60 °C
Other features	Cable colour	Black
Package dimensions (verified)	Depth Verified	24 cm
	Gross Weight Verified	1,302 kg
	Height Verified	9,2 cm
	Width Verified	25,4 cm
Product dimensions	Net Weight (Product, kg)	1,2 kg
Vendor information	Brand Name	Vivolink
	Warranty	99 Rok (y)
Weight & dimensions	Cable diameter	9,5 mm

## Další produkty z této série

Cable length	
0,5	PROHDMIHDM0.5
1,0	PROHDMIHDM1
1,5	PROHDMIHDM1.5
2,0	PROHDMIHDM2
3,0	PROHDMIHDM3
5,0	PROHDMIHDM5
7,5	PROHDMIHDM7.5
10,0	PROHDMIHDM10
12,5	PROHDMIHDM12.5
15,0	PROHDMIHDM15
20,0	PROHDMIHDM20

## Další obrázky





Specifications

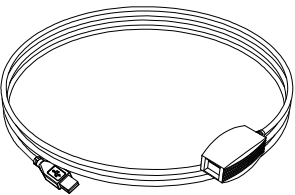
# Active USB extension cable

Model USB-XT

Overview

You can use a maximum of three active USB extension cables to extend a 16' (5 m) USB cable to 64' (20 m).

For more information about extending USB connections with the active USB extension cable, see *Extending USB connections* ([smarttech.com/kb/099641](https://smarttech.com/kb/099641)).



Notes

- If you connect more than three active USB extension cables, you can exceed the USB specification limit of five hubs if your computer or a connected device has an internal hub.
- The USB-XT extension cable is compatible with all of SMART's currently supported USB-connected products. It supports a maximum communication speed of 480 Mbps (High-Speed).

Dimensions and weights\*

Length	16' (5 m)
Module size	2 3/8" × 5 3/8" × 1" (60 mm × 135 mm × 27.6 mm)
Weight	5.3 oz (150 g)
Shipping weight	1 lb. (450 g)
Shipping size	2" × 10 1/2" × 9 3/8" (508 mm × 267 mm × 238 mm)

Standard features

USB device support	USB 2.0 high speed (up to 480 Mbps) and USB 1.1 (12 Mbps) devices Recognized as one USB hub by the computer's operating system
Compatibility	Windows® operating systems, macOS operating system software and Linux® operating systems
Connectors	One USB-A receptacle One USB-A plug

\* All dimensions ± 1/8" (0.3 cm).



## Active USB extension cable – Model USB-XT

### Specifications

## Storage and operating requirements

<b>Power supply</b>	Bus powered from upstream hub or computer interface
<b>Power consumption</b>	5 mA maximum, 3 mA typical
<b>Operating temperature</b>	32°F to 104°F (0°C to 40°C)
<b>Storage temperature</b>	-40°F to 185°F (-40°C to 85°C)

## Certification and compliance

<b>Regulatory certification</b>	FCC and CE Class B
<b>Environmental compliance</b>	RoHS (Europe) and WEEE

## Purchasing information

<b>Order number</b>	
USB-XT	Bus powered active USB extension cable
<b>Warranty</b>	One-year limited equipment warranty

[smarttech.com/support](https://smarttech.com/support)  
[smarttech.com/contactsupport](https://smarttech.com/contactsupport)

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## AutoCont OfficePro 1049

**Operační systém:** Windows 11 Pro 64-bit (National Academic) (Standard)

**Počítačová skříň:** Fractal Design Pop Mini Silent Black Solid (2× 5,25", 2× 3,5", 2× 2,5", 2× 2.5"/3.5", USB 3.2 Gen)

**Napájecí zdroj:** GIGABYTE 450W 80PLUS Bronze

**Základní deska:** MB MSI PRO H610M-E DDR4

**Procesor (CPU):** Intel Core i3-14100F BOX (3.5GHz, LGA1700)

**Paměť RAM:** 32 GB DDR4-3200MHz CL16 Kingston FURY Beast

**Grafická karta (GPU):** GIGABYTE RTX 3050 OC Low Profile 6G

**Pevný disk:** 1000 GB SSD NV3 KS M.2 PCIe 4.0 NVMe

**Klávesnice:** GENIUS USB CZ+SK černá

**Myš:** GENIUS optická USB černá

**Benchmark CPU k 17.12.2024 (15 363 bodů), zdroj:** <https://www.cpubenchmark.net/>

Požadavek zadavatele dle tech. specifikace CPU benchmark 15 000 bodů.

Single CPU Systems			
Last updated on the 17th of December 2024			
Column			
CPU Name	CPU Mark (higher is better)	Rank (lower is better)	CPU Value (higher is better)
Intel Core i3-14100F	15,363	888	170.51

**Benchmark GPU k 17.12.2024 (10 685 bodů), zdroj:** <https://www.videocardbenchmark.net/>

Požadavek zadavatele dle tech. specifikace GPU benchmark 10 000 bodů.

Videocard Name	Passmark G3D Mark (higher is better)	Rank (lower is better)	Videocard Value (higher is better)	Price (USD)
GeForce RTX 2080 Ti	21728	46	16.78	\$
GeForce RTX 2080 with Max-Q Design	13025	154	6.20	\$
GeForce RTX 3050 4GB Laptop GPU	6780	312	NA	NA
GeForce RTX 3050 6GB	10685	202	62.86	\$

**Dell P2724DEB**  
**Video Conferencing Monitor**  
User's Guide

Model: P2724DEB  
Regulatory model: P2724DEBt





**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



**WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Rev. A00

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## Safety instructions

Use the following safety guidelines to protect you monitor from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that shipped with your monitor.

 **NOTE: Before using the monitor, read the safety information that is shipped with your monitor and printed on the product. Keep the documentation at a secure location for future reference.**

 **WARNING: Use of controls, adjustments, or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards, and/or mechanical hazards.**

 **WARNING: The possible long-term effect of listening to audio at high volume through the headphones (on monitor that support it) may cause damage to your hearing ability.**

- Place the monitor on a solid surface and handle it carefully. The screen is fragile and can be damaged if dropped or hit with a sharp object.
- Ensure that your monitor is electrically rated to operate with the AC power available in your location.
- Keep the monitor in room temperature. Excessive cold or hot conditions can have an adverse effect on the liquid crystals of the display.
- Connect the power cable from the monitor to a wall outlet that is near and accessible. See [Connecting your monitor](#).
- Do not place and use the monitor on a wet surface or near water.
- Do not subject the monitor to severe vibration or high impact conditions. For example, do not place the monitor inside a car trunk.
- Unplug the monitor when it is going to be left unused for an extended period.
- To avoid electric shock, do not attempt to remove any cover or touch the inside of the monitor.
- Read these instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product.
- Certain monitors can be wall mounted using the VESA mount that is sold separately. Ensure to use the correct VESA specifications as mentioned in the wall mounting section of the User's Guide.

For information on safety instructions, see the Safety, Environmental, and Regulatory Information (SERI) document that is shipped with your monitor.





# About your monitor




## Package contents

The following table provides the list of components that are shipped with your monitor. If any component is missing, contact Dell. For more information, see [Contact Dell](#).

 **NOTE: Some items may be optional and may not ship with your monitor. Some features may not be available in certain countries.**

Component image	Component description
	Display
	Stand riser
	Stand base
	Power cable (varies by country)
	DisplayPort 1.8 M cable (DisplayPort to DisplayPort)



	USB 3.2 Gen1 1.8 M Type-A to Type-B upstream cable
	USB-C® Gen2 1.0 M cable (C to C)
	<ul style="list-style-type: none"><li>• Quick Setup Guide</li><li>• Safety, Environmental, and Regulatory Information</li></ul>

### Product features

The **Dell P2724DEB** monitor has an active matrix, Thin-Film Transistor (TFT), Liquid Crystal Display (LCD), and LED backlight. The monitor features include:

- 68.47 cm (27.0 in.) active area display (measured diagonally) 2560 x 1440 (16:9) resolution, plus full-screen support for lower resolutions.
- Wide viewing angles with 99% sRGB color.
- Tilt, swivel, pivot and vertical extension adjustment capabilities.
- Built-in speakers (2 x 5 W).
- Removable pedestal stand and Video Electronics Standards Association (VESA™) 100 mm mounting holes for flexible mounting solutions.
- Ultra-thin bezel minimizes the bezel gap during multi-monitor usage, enabling easier set up with an elegant viewing experience.
- Extensive digital connectivity with DP helps future-proof your monitor.
- Single USB Type-C® to supply power to compatible notebook while receiving video signal.
- USB-C and RJ45 ports enable a single-cable, network-connected experience.
- Plug and play capability if supported by your computer.
- On-Screen Display (OSD) adjustments for ease of set-up and screen optimization.
- Power and OSD buttons lock.
- Security lock slot.
- Stand lock.
- The monitor is designed with Dell Power Button Sync (DPBS) feature to control PC system power state from monitor power button.\*



- The Monitor allows multiple monitors that are daisy chained via DisplayPort to synchronize a pre-defined group of OSD settings in the background by Multi-Monitor Sync (MMS).
  - Premium Panel Exchange for peace of mind.
  - Optimize eye comfort with a flicker-free screen and ComfortView Plus feature.
  - This monitor uses low blue light panel. When the monitor is reset to factory settings or default setting (Preset mode: Standard), it works in compliance with TUV Rheinland (hardware solutions provider).
  - Decreases the level of hazardous blue light emitted from the screen to make viewing more comfortable for your eyes.
  - The monitor adopts Flicker-Free technology, which clears the eye-visible flicker, brings comfort viewing experience and prevents users from suffering eye strain and fatigue.
  - Certified for Microsoft Teams® and Zoom®.
  - Certified for Windows Hello® (Face Authentication) and supports Microsoft Cortana®.
  - Additional customization using Dell Peripheral Manager/Dell Display Manager (DDM) for Windows operating system and Dell Display and Peripheral Manager (DDPM) for Mac operating system.
- \* Dell system that supports DPBS is listed in Dell website. DPBS function can be enabled in OSD menu under Display.

**⚠ WARNING: The possible long-term effects of blue light emission from the monitor may cause damage to the eyes, which includes but is not limited to eye fatigue and digital eyestrain. ComfortView Plus feature is designed to reduce the amount of blue light emitted from the monitor to optimize eye comfort.**

## Operating system compatibility

- Windows 10 Version 21H2 and Windows 11 Version 21H2\*
- macOS 12.3.1\*

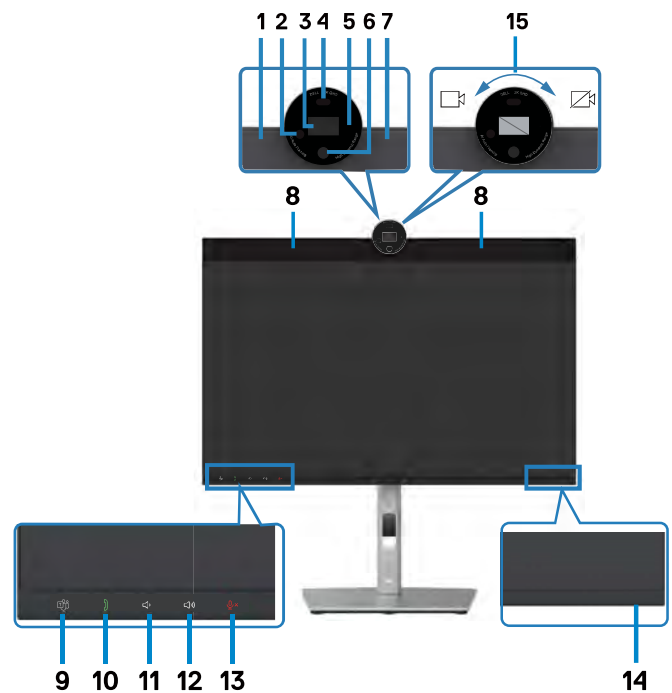
\*The operating system compatibility on Dell and Alienware branded monitors may vary based on factors such as:

- Specific release date(s) when operating system versions, patches, or updates are available.
- Specific release date(s) when Dell and Alienware branded monitor firmware, software application, or driver updates are available on the Dell support website.



# Identifying parts and controls

## Front view



Label	Description	Use
1,7	Microphones	Monitor microphones (Mic).
2	IR LED	Indicator of infrared (IR).
3	RGB Camera	Transmits your image in a video conference.
4	Proximity Sensor	Supports the human presence wake & lock feature.
5	Webcam LED indicator	Indicator of Webcam. It will light up in white when webcam is in use.
6	IR Camera	Supports the face recognition feature.
8	Built-in speakers	To output the sound from audio input.



<b>9</b>	Teams button & LED	<p>LED will light in static white when Microsoft Teams® is signed in and running.</p> <p>LED will blink when there is a Teams notification.</p> <p>Short press on the button to bring up Teams and open notification. Ensure that the Teams application is signed in and is already running at the background.</p> <p><b>NOTE:</b> For the Teams button to work, ensure that the Teams account is provisioned/setup as 'Teams Only' mode. The tenant administrator should enable the account to 'Teams Only' mode.</p> <p><b>NOTE:</b> Teams button will only work with Teams application in 'Teams Only' mode. Setting might vary in corporate environment, resulting in Teams button not working on the monitor. Please check with your system administrator.</p>
<b>10</b>	Hookswitch & LED	<p>LED will blink in green when there is an incoming Teams/Skype for Business (SfB) call.</p> <p>LED will light up in static green during Teams/Skype for Business (SfB) call.</p> <p>Short press to answer/end call.</p> <p>Long press to reject incoming call.</p>
<b>11</b>	Volume down & LED	<p>Short press for 2 unit volume decrement.</p> <p>Long press for continuous volume decrement.</p>
<b>12</b>	Volume up & LED	<p>Short press for 2 unit volume increment.</p> <p>Long press for continuous volume increment.</p>
<b>13</b>	Microphone mute & LED	<p>Press to mute and unmute microphone.</p> <p>LED will light up in static red when mic is muted.</p> <p>LED will go dark when mic is enabled/unmuted.</p>
<b>14</b>	Power LED indicator	<p>Solid white light indicates the monitor is turned on and functioning normally. Breathing white light indicates the monitor is in Standby Mode.</p>



15	Camera Shutter Close/Open	<p>Rotate clockwise to close camera shutter. When closed, the camera will replace the image with a black pattern.</p> <p>Rotate counterclockwise to open camera shutter. When opened, UC applications can open camera function to use the camera when it is needed.</p> <p><b>NOTE:</b> The close camera shutter is different from the disable 'Webcam &amp; Presence Sensor' in OSD menu. Disabling 'Webcam &amp; Presence Sensor' will turn off the whole webcam module, hence webcam and sensor will not appear in the system.</p>
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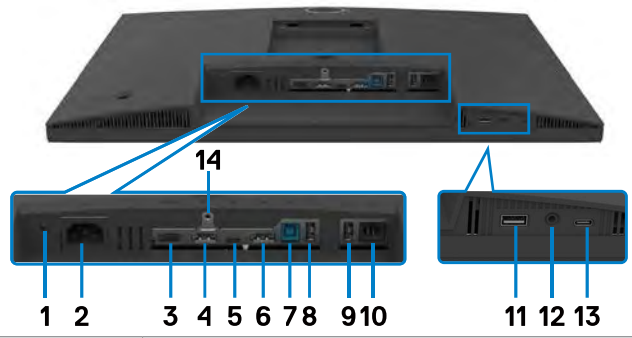
### Back view










Label	Description	Use
1	VESA mounting holes (100 mm x 100 mm-behind attached VESA cover)	Wall mount monitor using VESA-compatible wall mount kit (100 mm x 100 mm).
2	Regulatory label	Lists the regulatory approvals.
3	Stand release button	Releases stand from the monitor.
4	Power On/Off button	To turn the monitor on or off.
5	Joystick	Use it to control the OSD menu. For more information, see <a href="#">Operating the Monitor</a> .
6	Mac Address, Barcode, serial number, and Service Tag label	Refer to this label if you need to contact Dell for technical support. The Service Tag is an unique alphanumeric identifier that enables Dell service technicians to identify the hardware components in your computer and access warranty information.
7	Cable-management slot	Use to organize cables by inserting them through the slot.









**Bottom view**



Label	Description	Use
1	Security lock slot (based on Kensington Security Slot™)	Secures monitor with security cable lock (sold separately).
2	 Power connector	Connect the power cable.
3	 HDMI port	Connect your computer with the HDMI cable.
4	 DisplayPort (in)	Connect your computer with the DisplayPort cable.
5	 USB Type-C upstream/ DisplayPort (Video + data)	Connect to your computer using the USB Type-C cable. The USB Type-C port offers the fastest transfer rate (USB 3.2 Gen1) and the alternate mode with DP 1.4 supporting maximum resolution of 2560 x 1440 at 60 Hz, PD 20 V/4.5 A, 15 V/3 A, 9 V/3 A, 5 V/3 A. <b>NOTE:</b> USB Type-C is not supported on Windows versions that are prior to Windows 10.
6	 DP port (out) 	DP output for MST (multi-stream transport) capable monitor. To enable MST, refer to instruction on section <b>“Connecting the Monitor for DP MST Function”</b> . <b>NOTE:</b> Remove the rubber plug when using DP out connector.
7	 USB-B upstream port	Connect the USB cable that comes with your monitor to the computer. Once this cable is connected, you can use the USB downstream connectors on the monitor.





<b>8,9,11</b>	 Super speed USB 5 Gbps (USB 3.2 Gen1) (3)	Connect your USB device. You can use these ports only after you have connected the USB cable (Type-A to Type-B or Type-C to Type-C) from the computer to the monitor. Port with  battery icon supports Battery Charging Rev. 1.2.
<b>10</b>	 RJ45 connector	Connect to Internet. You can surf Internet via RJ45 only after you have connected the USB cable (Type-A to Type-B or Type-C to Type-C) from the computer to the monitor.
<b>12</b>	 3.5 mm Combo Headphone with microphone jack	Connect headphones or headset through HDMI or DisplayPort or USB Type-C audio channels. To use the microphone function, ensure a USB upstream cable is connected and select Echo Cancelling Speakerphone audio path in the Sound setting interface. Headphone jack supports headset with microphone. <b>NOTE:</b> Excessive sound pressure from earphones or headphones can cause hearing damage or loss. Adjustment of the equalizer to maximum increases the earphones and headphones output voltage and therefore the sound pressure level.
<b>13</b>	 USB Type-C downstream port (Data only)	Port with  icon supports 5 V/3 A. Connect your USB device. You can use these ports only after you have connected the USB cable (Type-A to Type-B or Type-C to Type-C) from the computer to the monitor. <b>NOTE:</b> This port is downstream only and unable to broadcast video or sound to the display or speakers.
<b>14</b>	Stand lock	Lock the stand to the monitor using a M3 x 6 mm screw (screw not included).



## Monitor specifications

Model	P2724DEB
Screen type	Active matrix - TFT LCD
Panel Type	In-plane switching Technology
Aspect ratio	16:9
Viewable image dimensions	
Diagonal	68.47 cm (27 in.)
Active Area	
Horizontal	596.74 mm (23.49 in.)
Vertical	335.66 mm (13.22 in.)
Area	200301.75 mm <sup>2</sup> (310.47 in. <sup>2</sup> )
Pixel pitch	0.2331 mm x 0.2331 mm
Pixel per inch (PPI)	108.79
Viewing angle	
Horizontal	178° (typical)
Vertical	178° (typical)
Brightness	350 cd/m <sup>2</sup> (typical)
Contrast ratio	1000 to 1 (typical)
Display screen coating	Anti-glare treatment of the front polarizer (3H) hard coating
Backlight	LED
Response Time (Gray to Gray)	5 ms (Fast mode) 8 ms (Normal mode)
Color depth	16.78 million colors
Color gamut <sup>1</sup>	99% sRGB
Connectivity	• 1 x DP 1.4 (HDCP 1.4) • 1 x HDMI 1.4 (HDCP 1.4) <sup>2</sup>



	<ul style="list-style-type: none"> <li>• 1 x USB Type-B (USB 3.2 Gen1 upstream port)</li> <li>• 1 x USB Type-C (Alternate mode with DisplayPort 1.4, USB 3.2 Gen1 upstream port, Power Delivery PD up to 90 W)</li> <li>• 1 x USB Type-C downstream (15 W), USB 3.2 Gen1 (5 Gbps)</li> <li>• 1 x DP (Out) with MST</li> <li>• 2 x super speed USB 5 Gbps (USB 3.2 Gen1)</li> <li>• 1 x super speed USB 5 Gbps (USB 3.2 Gen1) with BC 1.2 charging capability at 2 A (max)</li> <li>• 1 x 3.5 mm headphone jack</li> <li>• 1 x RJ45</li> </ul>
Border width (edge of monitor to active area)	
Top	38.37 mm
Left/Right	7.52 mm
Bottom	17.20 mm
Adjustability	
Height adjustable stand	150 mm
Tilt	-5° to 21°
Swivel	-45° to 45°
Pivot	-90° to 90°
Slant adjust	NA
Cable management	Yes
Dell Display Manager (DDM)Compatibility	Easy Arrange and other key features
Security	Security lock slot (cable lock sold separately)

<sup>1</sup> At panel native only, under Custom Mode preset.

<sup>2</sup> Supports up to QHD 2560 x 1440 at 60Hz as per specified in HDMI 1.4.



## Resolution specifications

<b>Model</b>	<b>P2724DEB</b>
Horizontal scan range	30 kHz to 90 kHz
Vertical scan range	56 Hz to 76 Hz
Default resolution	2560 x 1440 at 60 Hz
Video display capabilities (HDMI & DP & USB Type-C alternate mode)	480p, 560p, 720p, 1080p 1080i (HDMI only)

## Preset display modes

<b>Display mode</b>	<b>Horizontal frequency (kHz)</b>	<b>Vertical frequency (Hz)</b>	<b>Pixel clock (MHz)</b>	<b>Sync polarity (Horizontal/ Vertical)</b>
VESA, 720 x 400	31.50	70.0	28.30	-/+
VESA, 640 x 480	31.50	60.0	25.20	-/-
VESA, 640 x 480	37.50	75.0	31.50	-/-
VESA, 800 x 600	37.90	60.30	40.0	+/+
VESA, 800 x 600	46.90	75.0	49.50	+/+
VESA, 1024 x 768	48.40	60.0	65.0	-/-
VESA, 1024 x 768	60.0	75.0	78.80	+/+
VESA, 1152 x 864	67.50	75.0	108.0	+/+
VESA, 1280 x 1024	64.0	60.0	108.0	+/+
VESA, 1280 x 1024	80.0	75.0	135.0	+/+
VESA, 1600 x 1200	75.0	60.0	162.0	+/+
VESA, 1920 x 1080	67.50	60.0	148.5	+/+
VESA, 2048 x 1080	26.37	24.00	58.23	+/-
VESA, 2048 x 1080	66.58	60.0	147.16	+/-
VESA, 2560 x 1440	88.80	60.0	241.50	+/-



## DP Multi-Stream Transport (MST) Modes

Host video port	MST Source Monitor	Maximum number of external monitors that can be supported
		2560 x 1440 at 60 Hz
HBR3 (DP 1.4)	2560 x 1440 at 60 Hz	3
HBR2 (DP 1.2)	2560 x 1440 at 60 Hz	1

 **NOTE: Maximum external monitor resolution supported is 2560 x 1440 at 60 Hz only.**

 **NOTE: DP output for MST is supported.**

## USB-C Multi-Stream Transport (MST) Modes

OSD Display Info: Link rate(current)	Maximum number of external monitors that can be supported
	2560 x 1440 at 60 Hz
HBR3 (DP 1.4)	1
HBR2 (DP 1.2)	0



## Unified Communications (UC) Platform Compatibility List

The table below highlights the call functions that work on the Dell Video Conferencing Monitor – P2724DEB monitor when using the following UC platforms.

Call functions	Button	UC platforms		
		Microsoft Teams	Skype for Business	Zoom
Bring up Microsoft Teams	Teams	Supported	Not supported	Not supported
Answer call	Hookswitch	Supported	Supported	Not supported
End call	Hookswitch	Supported	Supported	Not supported
Reject call	Hookswitch	Supported	Supported	Not supported
Adjust speaker volume down	Volume down	Supported	Supported**	Supported
Adjust speaker volume up	Volume up	Supported	Supported**	Supported
Mute/unmute microphone	Mute	Supported	Supported	Supported*

\* Mute function on the Dell P2724DEB monitor works by pressing the Mute button. However, the Mute icon on the UC platform is not synchronized (icon shows unmute).

\*\* Volume function on the Dell P2724DEB monitor does not work on macOS.

 **NOTE:** For information about supported operating system, see [Operating system compatibility](#).



## Electrical specifications

Model	P2724DEB
Video input signals	<ul style="list-style-type: none"> <li>• Digital video signal for each differential line</li> <li>• Per differential line at 100 ohm impedance</li> <li>• DP/HDMI/USB Type-C signal input support</li> </ul>
Input voltage/frequency/current	100-240 VAC/50 or 60 Hz $\pm$ 3 Hz/2.5 A (maximum)
Inrush current	120 V: 42 A (Max.) 240 V: 80 A (Max.)
Power Consumption	0.3 W (Off Mode) <sup>1</sup> 0.3 W (Standby Mode) <sup>1</sup> 0.9 W (Networked standby mode) <sup>1</sup> 26.0 W (On Mode) <sup>1</sup> 210 W (Max) <sup>2</sup> 20.6 W (P <sub>on</sub> ) <sup>3</sup> 68.68 kWh (TEC) <sup>3</sup>

<sup>1</sup>As defined in EU 2019/2021 and EU 2019/2013.

<sup>2</sup>Max brightness and contrast setting with maximum power loading on all USB ports.

<sup>3</sup>P<sub>on</sub>: Power consumption of On Mode as defined in Energy Star 8.0 version.

TEC: Total energy consumption in kWh as defined in Energy star 8.0 version.

This document is informational only and reflects laboratory performance. Your product may perform differently, depending on the software, components and peripherals you ordered and shall have no obligation to update such information. Accordingly, the customer should not rely upon this information in making decisions about electrical tolerances or otherwise. No warranty as to accuracy or completeness is expressed or implied.

 **NOTE: This monitor is ENERGY STAR certified.**



This product qualifies for ENERGY STAR in the factory default settings which can be restored by "Factory Reset" function in the OSD menu. Changing the factory default settings or enabling other features may increase power consumption that could exceed the ENERGY STAR specified limit.



**Webcam specifications**

Video Resolution & Frame Size	• 2K (2560 x 1440) @ 30 fps, USB 3.0 • FHD (1920 x 1080) @ 30/60 fps, USB 2.0 • HD (1280 x 720) @ 30/60 fps, USB 2.0
USB Interface	USB 3.0
Field of view	78 degree
Shutter	Manual shutter
Windows Hello	Yes
AI Auto Framing	Yes
Auto focus	Yes
Zoom	4x Digital Zoom
Aperture	f2.0

**Speaker specifications**

Speaker rated power	2 x 5 W
Frequency Response	100 Hz - 20 kHz
Impedance	8 ohm

**Microphone specifications**

Microphone type	Digital microphone x 2
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**Physical characteristics**

Model	P2724DEB
Connector type	• DP connector (in) • DP connector (out) • HDMI connector • Audio jack • RJ45 connector • USB Type-C upstream connector • USB Type-B upstream connector • USB 3.2 Gen1 downstream connector x 3 • USB Type-C downstream connector
Signal cable type	DP to DP 1.8 M cable USB 3.2 Gen1 Type-A to B 1.8 M cable USB 3.2 Gen2 C to C 1.0 M cable





Dimensions	
Height (extended)	590.79 mm (23.26 in.)
Height (compressed)	440.79 mm (17.35 in.)
Width	611.78 mm (24.09 in.)
Depth	230.00 mm (9.10 in.)
Dimensions (without stand)	
Height	415.82 mm (16.37 in.)
Width	611.78 mm (24.09 in.)
Depth	59.61 mm (2.35 in.)
Stand dimensions	
Height (extended)	428.30 mm (16.90 in.)
Height (compressed)	381.50 mm (15.02 in.)
Width	300.00 mm (11.81 in.)
Depth	230.00 mm (9.10 in.)
Weight	
Weight with packaging	11.26 kg (24.82 lb)
Weight with stand assembly and cables	8.65 kg (19.07 lb)
Weight without stand assembly (For wall mount or VESA mount considerations - no cables)	5.65 kg (12.46 lb)
Weight of stand assembly	2.62 kg (5.78 lb)



Environmental characteristics

Compliant Standards	
<ul style="list-style-type: none"><li>• ENERGY STAR certified Monitor.</li><li>• EPEAT registered where applicable. EPEAT registration varies by country. See <a href="https://www.epeat.net">https://www.epeat.net</a> for registration status by country.</li><li>• TCO Certified &amp; TCO Certified Edge.</li><li>• RoHS Compliant.</li><li>• BFR/PVC Free monitor (excluding external cables).</li><li>• Meets NFPA 99 leakage current requirements.</li><li>• Arsenic-Free glass and Mercury-Free for the panel only.</li></ul>	
Temperature	
Operating	0°C to 40°C (32°F to 104°F)
Non-operating	-20°C to 60°C (-4°F to 140°F)
Humidity	
Operating	10% to 80% (non-condensing)
Non-operating	5% to 90% (non-condensing)
Altitude	
Operating	5,000 m (16,404 ft) (maximum)
Non-operating	12,192 m (40,000 ft) (maximum)
Thermal dissipation	716.55 BTU/hour (maximum)
	88.72 BTU/hour (on mode)

Video bandwidth

Host video port	Video cable	Color depth	Resolution
USB-C (Alt Mode DP 1.2)	USB-C Gen2 cable	8 bits	2560 x 1440 @ 60Hz
USB-C (Alt Mode DP 1.4)	USB-C Gen2 cable	8 bits	2560 x 1440 @ 60Hz
HDMI 1.4	HDMI 2.0 cable	8 bits	2560 x 1440 @ 60Hz
HDMI 2.0		8 bits	2560 x 1440 @ 60Hz
DP 1.2	DP cable	8 bits	2560 x 1440 @ 60Hz
DP 1.4		8 bits	2560 x 1440 @ 60Hz



### Audio path

Host video port	USB upstream cable	Audio path
USB-C (Alt Mode DP 1.2)	USB-C Gen1/2 cable	Echo Cancelling Speakerphone (DELL P2724DEB USB)
		DELL P2724DEB (Display Audio)
USB-C (Alt Mode DP 1.4)	USB-C Gen1/2 cable	Echo Cancelling Speakerphone (DELL P2724DEB USB)
		DELL P2724DEB (Display Audio)
DP	USB-A to USB-B cable connected	Echo Cancelling Speakerphone (DELL P2724DEB USB)
	USB-A to USB-B cable not connected	DELL P2724DEB (Display Audio)
HDMI	USB-A to USB-B cable connected	Echo Cancelling Speakerphone (DELL P2724DEB USB)
	USB-A to USB-B cable not connected	DELL P2724DEB (Display Audio)

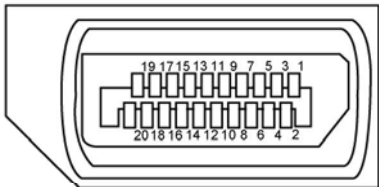
### USB speed bandwidth

Host	USB upstream cable	USB Device connected to USB-A or USB-C downstream port
USB-C (Alt Mode DP 1.2)	USB-C Gen2 cable	supported, USB 2.0/3.2 Gen1
USB-C (Alt Mode DP 1.4)	USB-C Gen2 cable	supported, USB 2.0/3.2 Gen1
USB-A 2.0	USB-A to USB-B cable	supported, USB 2.0
USB-A 3.2 Gen1	USB-A to USB-B cable	supported, USB 2.0/3.2 Gen1
USB-C 3.2 Gen1 (Data only)	USB-C Gen2 cable	supported, USB 2.0/3.2 Gen1
USB-C 3.2 Gen2 (Data only)	USB-C Gen2 cable	supported, USB 2.0/3.2 Gen1



## Pin assignments

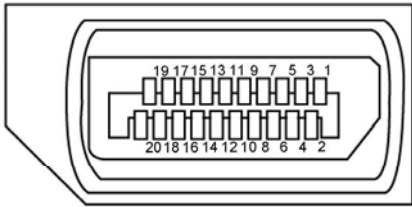
### DP port (in)



Pin number	20-pin side of the connected signal cable
1	ML3(n)
2	GND
3	ML3(p)
4	ML2(n)
5	GND
6	ML2(p)
7	ML1(n)
8	GND
9	ML1(p)
10	ML0(n)
11	GND
12	ML0(p)
13	CONFIG1
14	CONFIG2
15	AUX CH (p)
16	GND
17	AUX CH (n)
18	Hot Plug Detect
19	Return
20	DP_PWR



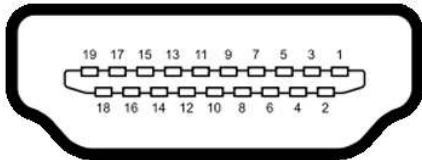
**DP port (out)**



Pin number	20-pin side of the connected signal cable
1	ML0(p)
2	GND
3	ML0(n)
4	ML1(p)
5	GND
6	ML1(n)
7	ML2(p)
8	GND
9	ML2(n)
10	ML3(p)
11	GND
12	ML3(n)
13	CONFIG1
14	CONFIG2
15	AUX CH(p)
16	GND
17	AUX CH(n)
18	Hot Plug Detect
19	Return
20	DP_PWR



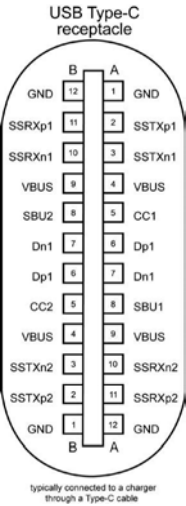
**HDMI port**



Pin number	19-pin side of the connected signal cable
1	TMDS DATA 2+
2	TMDS DATA 2 SHIELD
3	TMDS DATA 2-
4	TMDS DATA 1+
5	TMDS DATA 1 SHIELD
6	TMDS DATA 1-
7	TMDS DATA 0+
8	TMDS DATA 0 SHIELD
9	TMDS DATA 0-
10	TMDS CLOCK+
11	TMDS CLOCK SHIELD
12	TMDS CLOCK-
13	CEC
14	Reserved (N.C. on device)
15	DDC CLOCK (SCL)
16	DDC DATA (SDA)
17	DDC/CEC Ground
18	+5 V POWER
19	HOT PLUG DETECT



USB Type-C port



Pin	Signal	Pin	Signal
A1	GND	B12	GND
A2	SSTXp1	B11	SSRXp1
A3	SSTXn1	B10	SSRXn1
A4	VBUS	B9	VBUS
A5	CC1	B8	SBU2
A6	Dp1	B7	Dn1
A7	Dn1	B6	Dp1
A8	SBU1	B5	CC2
A9	VBUS	B4	VBUS
A10	SSRXn2	B3	SSTXn2
A11	SSRXp2	B2	SSTXp2
A12	GND	B1	GND



Universal Serial Bus (USB)

This section gives you information about the USB ports available on your monitor.

**NOTE:** Up to 2 A on USB downstream port (port with battery icon) with BC 1.2 compliance devices; up to 0.9 A on the other USB downstream ports; Up to 3 A on USB Type-C downstream port (port with icon) with 5 V/3 A compliance devices.

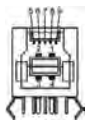
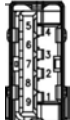
Your computer has the following USB ports:

- 2 upstream - at rear.
- 4 downstream - 2 at bottom, 2 at rear.

Power Charging Port - the ports with battery icon supports fast current charging capability if the device is BC 1.2 compatible. The USB Type-C downstream port with icon supports fast current charging capability if the device is 5 V/3 A compatible.

**NOTE:** The monitor’s USB ports work only when the monitor is on or on in Standby Mode. If the USB cable (Type-C to Type-C) is plugged in, the USB ports work normally. Otherwise, follow the OSD setting of Other USB Charging, if the setting is “On in Standby Mode” then USB work normally, otherwise USB is disabled. If you turn off the monitor and then turn it on, the attached peripherals may take a few seconds to resume normal functionality.

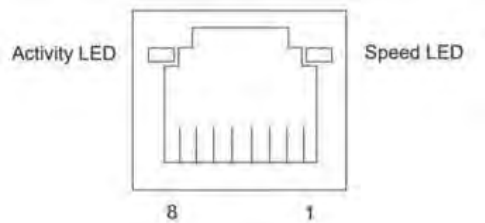
Transfer speed	Data rate	Maximum power consumption (each port)
Super speed	5 Gbps	4.5 W
High speed	480 Mbps	2.5 W
Full speed	12 Mbps	2.5 W

USB upstream port		USB downstream port	
			
Pin number	Signal name	Pin number	Signal name
1	VBUS	1	VBUS
2	D-	2	D-
3	D+	3	D+
4	GND	4	GND
5	StdB_SSTX-	5	StdA_SSRX-
6	StdB_SSTX+	6	StdA_SSRX+
7	GND_DRAIN	7	GND_DRAIN
8	StdB_SSRX-	8	StdA_SSTX-
9	StdB_SSRX+	9	StdA_SSTX+
Shell	Shield	Shell	Shield





**RJ45 Port (Connector Side)**



Pin No.	10BASE-T 100BASE-T	1000BASE-T
1	Transmit+	BI_DA+
2	Transmit-	BI_DA-
3	Receive+	BI_DB+
4	Unused	BI_DC+
5	Unused	BI_DC-
6	Receive-	BI_DB-
7	Unused	BI_DD+
8	Unused	BI_DD-

**Driver installation**

Install the Realtek USB GBE Ethernet Controller Driver available for your system. This is available for download at <https://www.dell.com/support> under the “Driver and download” section.


Network (RJ45) data rate via USB-C max speed is 1000 Mbps.

**Wake-on-LAN behavior**


Computer power save state	System behavior after receiving Wake-on-LAN (WOL) command
Modern Standby (S0ix)	Computer and Monitor remain in Standby but network communication is enabled.
Standby/Sleep (S3)	Both Computer and Monitor are turned ON.
Hibernate (S4)	Both Computer and Monitor are turned ON.
OFF/Shutdown (S5)	Both Computer and Monitor are turned ON.




 **NOTE:** The computer BIOS must be configured to enable WOL function first.

 **NOTE:** This LAN port is 1000Base-T IEEE 802.3az compliant, supporting Mac Address (Printed on model label) Pass-thru (MAPT), Wake-on-LAN (WOL) from standby mode (S3 only) and UEFI\* PXE Boot function [UEFI PXE Boot is not supported on Dell Desktop PC's (except for OptiPlex 7090/3090 Ultra Desktop)], these 3 features depend on BIOS settings and version of the OS. Functionality may vary with Non Dell PC's.

\*UEFI stands for Unified Extensible Firmware Interface.

 **NOTE:** WOL S4 and WOL S5 only capable with Dell Systems that support DPBS and is with USB-C connection only. Ensure DPBS function are enabled on both the Computer and Monitor.


 **NOTE:** Any issue related to WOL, users should debug the computer without monitor. After the problem is solved, then connect to the Monitor.



**RJ45 Connector LED status:**



LED	Color	Description
Right LED	Amber or Green	Speed indicator: <ul style="list-style-type: none"><li>• Amber On - 1000 Mbps</li><li>• Green On - 100 Mbps</li><li>• Off - 10 Mbps</li></ul>
Left LED	Green	Link/Activity indicator: <ul style="list-style-type: none"><li>• Blinking - Activity on the port.</li><li>• Green On - Link is being established.</li><li>• Off - Link is not established.</li></ul>

 **NOTE:** RJ45 cable is not the standard in-box accessory.



## Plug-and-Play capability

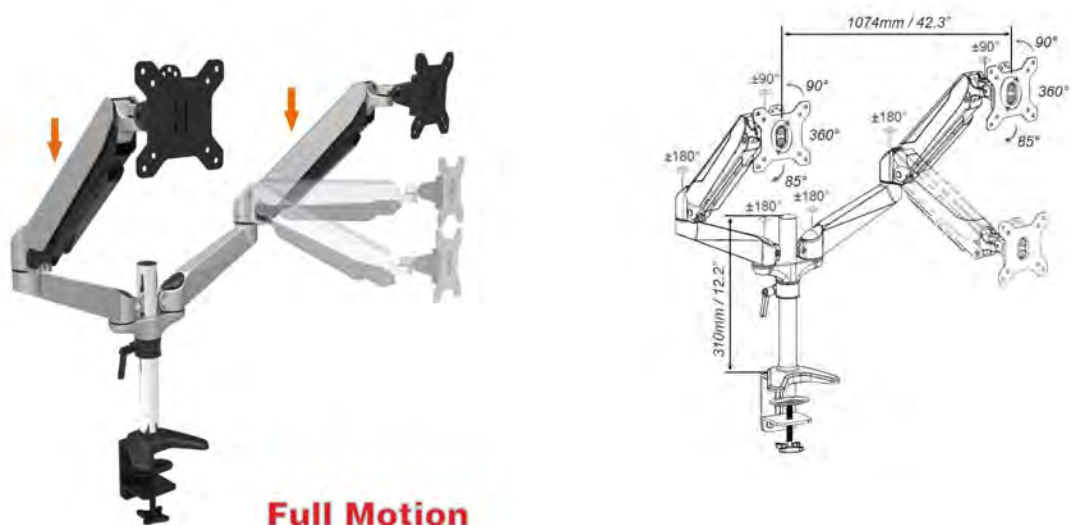
You can connect the monitor to any Plug and Play-compatible system. The monitor automatically provides the computer with its Extended Display Identification Data (EDID) using Display Data Channel (DDC) protocols so that the computer can configure itself and optimize the monitor settings. Most monitor installations are automatic; you can select different settings as required. For more information about changing the monitor settings, see [Operating the Monitor](#).

## LCD monitor quality and pixel policy

During the LCD Monitor manufacturing process, it is not uncommon for one or more pixels to become fixed in an unchanging state which are hard to see and do not affect the display quality or usability. For more information on Dell Monitor Quality and Pixel Policy, see <https://www.dell.com/pixelguidelines>.



## DM320 – Držák na 2 monitory do 30"



### **Popis produktu**

DM320 je držák na monitory 13"- 30", pro uchycení na stolovou desku, výškové a délkové nastavení, otočný, sklopný

Moderní designově velmi pěkně zpracovaný držák vhodný pro 2 monitory a podporou VESA standardu 75x75 a 100x100. Držák je kompletně polohovatelný a jeho velkou výhodou je možnost výškového nastavení. Otáčení do stran, nastavení vzdálenosti od nosníku, velké rozmezí sklonu, 2 typy uchycení na stolovou desku. Výborná kvalita, snadné nastavení polohy obrazovky a velmi pěkný moderní design jsou přednostmi tohoto držáku.

### **Technické údaje:**

maximální zatížení 18kg (2 x 9kg)

držák podporuje VESA standardy 75x75 a 100x100 lze dokoupit VESA adaptér 200x100 a 200x200

doporučená velikost obrazovek 13" až 30"

výšková polohovatelnost jak na nosníku, tak pohyblivým ramenem

vzdálenost monitoru od nosníku až 567mm

uchycení na stolové desky o síle 10 - 90mm

náklon -90/+85

součástí balení 2 typy uchycení na stůl – na kraj stolu nebo skrz stolovou desku

moderní design

jednoduché nastavení

snadná manipulace a nastavitelnost požadované polohy

systém pro vedení kabeláže

Dodáváme ve stříbrném provedení.

záruka 3 roky

## HDMI Distribution Amplifier with Audio Embedder, De-Embedder and HDCP

Part No 9132 0006



DA2HDMI-4K-Plus-A is a multifunctional distribution amplifier with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

DA2HDMI-4K-Plus-A features Advanced EDID Management and can emulate any HDMI display for continuous video output, even if the attached display is disconnected or powered down. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment. The EDID memories from 1 to 55 are factory preset, the memories from 62 to 98 are user programmable. EDID memories from 56 to 61 are for universal EDID presets. Memory 0 is transparent for output 1, memory 99 is transparent for output 2, so using these settings the EDID of the last attached display devices (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software wizard) the users can create their own EDID by completing four simple steps. Experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which can be uploaded to the user programmable memory of the DA2HDMI-4K-Plus-A.

DA2HDMI-4K-Plus-A can be rack-mounted or used standalone. The unit is equipped with the highest grade gold plated connectors to ensure reliable connection.

DA2HDMI-4K-Plus-A is capable of embedding and de-embedding audio to and from the PCM audio stream (other HDMI audio formats are passed through). Audio in port is a 3.5 jack socket, audio out is a 5-pole Phoenix socket. The unit also features a 3.5 jack output for headphone monitoring.

### Applications

- Rental and staging
- Military
- Medical
- Digital Signage
- Multiroom video
- Conference rooms, collaborative telepresence

### Features:

- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Local audio Embedding and De-Embedding
- Keeps source's HDMI or DVI output continuously active
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control
- Cable loss compensation at Input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- HDCP compliant
- 3,5mm Jack input
- 5-pole Phoenix Balanced Output
- 3,5mm Headphone Output
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support

## Specifications

Data rate per TMDS channel:	3 Gbps
Max resolution:	3840 x 2400 or 4096 x 2160
Reclocking:	Yes
HDCP pass through:	Yes
Input cable equalization:	Automatic max 20m @4k30, or 30m @1080p60
Digital audio formats	Supports up to 8 channel PCM (de-embed and pass-through) Dolby TrueHD (pass-through only) and DTS-HD Master Audio 7.1 (pass-through only) formats
Front panel control:	Yes, EDID learn button/Audio select EDID selector switch
LED indicators:	Live , Video Input Status, Audio Signal Format, Video Output Status
EDID emulation:	Yes, Advanced EDID management with 100 EDID memories
EDID memory:	55 factory preset , 6 universal, 2 transparent, 37 user programmable
EDID support:	256 byte Extended EDID
+5V Power on HDMI Outputs:	500 mA
Power:	Universal power adaptor, DC 5V 2.5A (max)
Power consumption:	1,8 W (max)
Enclosure:	1 mm metal
Dimensions:	100,4 W x 67,6 D x 26 H mm
Net weight:	250 g
Warranty:	3 years

## Connectors

Input / Output:	HDMI connector / 2x HDMI connectors
Audio Input / Output:	3.5 jack type / 5 pole Phoenix type
Local Headphone Monitoring Output:	3.5 jack type
Control:	Mini USB-B female connector
Power:	DC connector (1.35/3.5 mm )

### Optional accessory



#### Rack shelf

**Part No: 5240 0269**

The 1U high rack shelf provides mounting holes for fastening two half- rack or four quarter-rack sized units.

### Supplied accessory

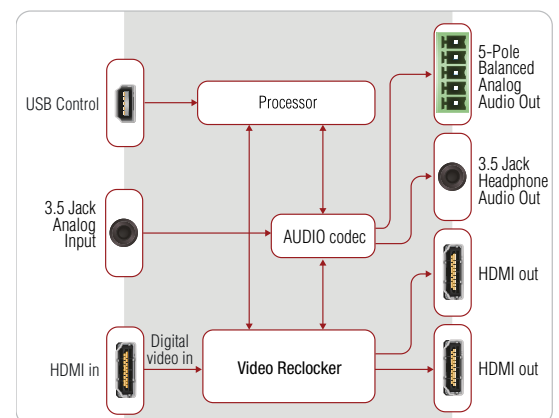


#### PSU-5VS

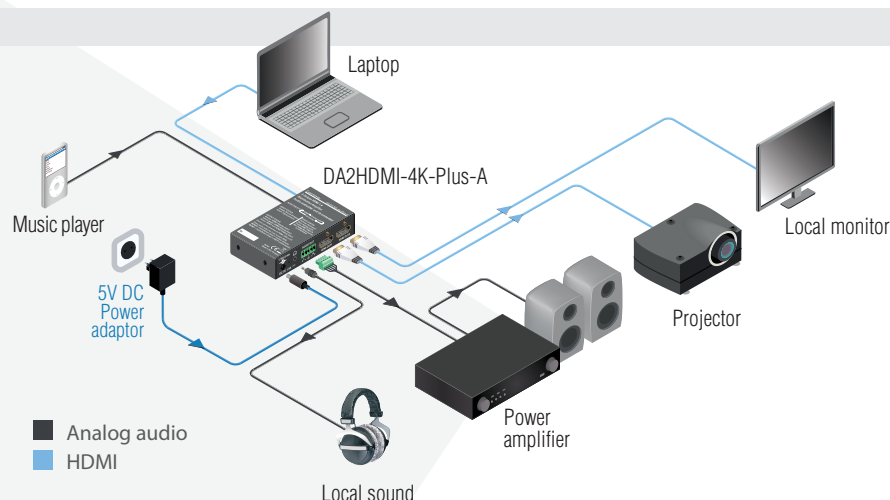
**Part No: 1180 0050**

Wall power adaptor with interchangeable plug for international use. Universal input: 100-240 V AC, 50-60 Hz, Output: 5 V DC, 2.5 A

### Port Diagram



### Standalone diagram



# SMART Document Camera 650

Model SDC-650



## Overview

The SMART Document Camera 650 connects digital learning to the physical world. This easy-to-use 4K Ultra HD visualizer captures live video and images directly to the SMART Board® interactive display, SMART Notebook® software, or your desktop. The SDC-650 is a fully UVC-compliant camera with built-in microphone that can be used as a high-quality webcam with SMART Board displays, keeping the continuity of a classroom experience even while video conferencing.

See [smarttech.com](http://smarttech.com) for more information on this product.

## Image

<b>Sensor</b>	1/3.2" CMOS
<b>Pixel count</b>	13 megapixels
<b>Effective pixels</b>	Horizontal: 3840 Vertical: 2160/60fps
<b>Frame rate</b>	Maximum 60 fps
<b>HDMI Output resolution</b>	3840 × 2160, 1920 × 1080, 1280 × 720
<b>USB Output resolution</b>	3840 × 2160, 1920 × 1080, 1280 × 720, 640 × 360, 2560 × 1920, 2048 × 1536, 1600 × 1200, 1280 × 960, 1024 × 768, 640 × 480, 1280 × 1024, 1280 × 800, 320 × 180, 320 × 240
<b>Wi-Fi streaming resolution</b>	3840 × 2160, 1920 × 1080, 1280 × 720, 640 × 360, 1280 × 960, 1024 × 768, 640 × 480, 1280 × 1024, 1280 × 800

## Optics

<b>Zoom</b>	Total 230x max. (10x Optical + 23x Digital Zoom)
<b>Focus</b>	Automatic/manual (via remote control or control panel) Automatic manual/area (via document camera software)
<b>Shooting area</b>	480 mm × 345 mm @ 470 mm

## Function

<b>Brightness</b>	Automatic/manual
<b>White balance</b>	Automatic/manual
<b>Contrast</b>	Automatic/manual
<b>Exposure</b>	Automatic/manual
<b>Image rotation</b>	0°–90° (rotate by camera head)/0°–180° (using document camera software)
<b>Image modes</b>	Normal, High Frame, High Quality, Microscope, Infinity, Macro
<b>Image effects</b>	Black and white, Negative, Color
<b>Image freeze</b>	Yes
<b>Lighting</b>	Built-in LED
<b>Mic</b>	Built-in
<b>Wi-Fi streaming</b>	1080p @30fps, up to 4K @30fps
<b>Wireless modes</b>	P2P <sup>1</sup> /Wi-Fi/Miracast
<b>Image/Video recording</b>	Yes <sup>2</sup>

## Compatibility

<b>Wireless network</b>	802.11a/b/g/n/ac
<b>Dual band</b>	2.4 GHz/5 GHz
<b>Wireless security</b>	Supports WEP, WPA/WPA2-PSK, WPA/WPA2-Enterprise (EAP-PEAP, EAP-TLS)
<b>Miracast support</b>	Yes
<b>UVC compliant</b>	Yes
<b>Software</b>	SMART Notebook 20.1 or later SMART Document Camera 650 software

<sup>1</sup>Peer-to-Peer (P2P) supported with SMART Document Camera 650 software for Windows and macOS.

<sup>2</sup>Available via connected USB drive (not included), SMART Notebook, or document camera software.



## SMART Document Camera 650 specifications

INPUTS	Qty
Power DC 5V	1
HDMI	1
USB 2.0 Type-A <sup>3</sup>	1

OUTPUTS	Qty
HDMI 4K @ 50 Hz/60 Hz, 1080p @ 50 Hz/60 Hz, 720p @ 50 Hz/60 Hz	1
USB mini-B4	1
USB 2.0 Type-A <sup>5</sup>	1

Included cables and accessories	Qty
Power adapter and AC cord	1
Remote control	1
AAA Batteries	2
Wi-Fi Dongle <sup>6</sup>	2
Anti-glare sheet	1
Illustrated installation instructions	1

Warranty	
Equipment	Five-year limited equipment warranty
Battery	One-year limited battery warranty

Power	
Power source	100–240 V (AC) 50–60 Hz
Power supply	DC 5 V, 3 A
Internal battery	Li-ion internal (3.6 V/6800 mAh) Charge time with power off: 3 hours Charge time with power on: 7 hours

### Note

Battery life varies based on function; the battery can last up to 2 hours. Battery life may reduce over time.

Storage and operating requirements	
Power consumption at 77°F (25°C)	Maximum: 13.7W (Lamp On, Charging), 11W (Standby, Charging) Operating: 8.7W (Lamp On, fully Charged), 7.7W (Lamp Off, fully Charged)
Operating temperature	32°F–95°F (0°C–35°C)
Storage temperature	–4°F–140°F (–20°C–60°C)
Humidity	30% to 85% relative humidity, non-condensing

Certification and compliance (partial) <sup>7</sup>	
U.S. / Canada	FCC, ISED, CONEG Packaging, Proposition 65
EU / EEA / EFTA / UK	CE, UKCA, LVD, CB, EMCD, RED, REACH, RoHS, Batería, WEEE, Embalaje, POP
EAEU	EAC
Performance standards	HDMI, USB
Other	Contact your reseller or sales representative

Purchasing information	
Order number: SDC-650	SMART Document Camera 650
Optional accessories	Microscope attachments (see <a href="https://smarttech.com/accessories">smarttech.com/accessories</a> )

<sup>3</sup>For the Wi-Fi dongle.

<sup>4</sup>For connecting to a computer; charging in Standby mode.

<sup>5</sup>For connecting a USB storage device.

<sup>6</sup>One is connected to the document camera and the other is for connecting to a computer.

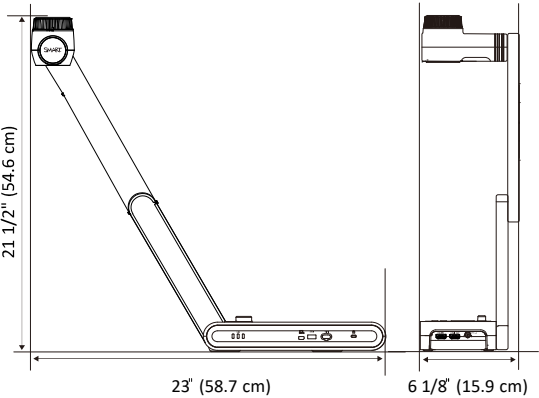
<sup>7</sup>Product availability may vary by region.

Dimensions and weights

Note

All dimensions ± 1/8" (0.3 cm). All weights ± 2 lb. (0.9 kg).

Dimensions



Dimensions

Set up  
6 1/8" W × 21 1/2" H × 23" L  
(15.9 cm × 54.6 cm × 58.7 cm)

Folded  
6 1/8" W × 3" H × 14 1/8" L  
(15.9 cm × 7.6 cm × 36.4 cm)

Weight

5.7 lb. (2.6 kg)

Shipping dimensions

18" W × 10 1/2" H × 6 7/8" L  
(45.5 cm × 27 cm × 17.5 cm)

Shipping weight

8 lb. (3.7 kg)

VESA mount

M4, 75 × 75 mm

[smarttech.com](http://smarttech.com)  
[smarttech.com/contact](http://smarttech.com/contact)

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# HP Stereo USB Headset G2

Sounds good? Sounds great.

Plug right in and get ready to speak and hear clearly all day. With noise-cancelling, comfortable design, and easy adjustment, your sound comfort will carry you from call to call without interference or frustration.



## Control the Call

Hop on any call with ease. The flexible boom mic blocks the background noise to keep your call focused. The in-line volume control and mute keeps you in control of your environment.

## Snug and Comfortable

These durable vegan leather earcups are designed for all-day comfort. Just adjust the head strap to be perfectly snug so you can hop on and off calls all day without soreness.

## Simple USB-A Connection

A simple USB-A plug will have you on the call in seconds with a connection that won't glitch out or lose power.

## Works With Chromebook certified

The Works With Chromebook badge on a device means it's optimized to work with your Chromebook and other Chrome OS devices<sup>1</sup>. Enjoy a seamless experience across Works With Chromebook certified accessories<sup>2</sup>. Look for the Works With Chromebook badge and rest assured that it'll all work together.

# HP Stereo USB Headset G2



Compatibility	Compatible with PCs with available USB-A port.
Product dimensions	16.5 x 13 x 5 cm (not including boom mic)
Weight	0.09 kg; Packed: 0.21 kg 0.21 lb; Packed: 0.47 lb
Warranty	Two years limited warranty
What's in the box	Headset; Quick Start guide; Warranty
Country of origin	Made in China
Product number	428H5AA
Master carton dimension (Width x Depth x Height)	38.4 x 30.8 x 58 cm
Master carton weight	7.84 kg
Compatible operating systems	Windows 10; macOS; Chrome OS
What's in the box	Headset; Quick Start guide; Warranty
@@Product Dimensions (metric)@@	16.5 x 13 x 5 cm (not including boom mic)
Product dimensions (imperial)	6.49 x 5.11 x 1.96 in (not including boom mic)
Weight (metric)	0.09 kg
Weight (imperial)	0.21 lb
Package dimensions (metric)	17 x 14.4 x 5.4 cm
Package dimensions (imperial)	6.7 x 5.67 x 2.13 in
Package weight (metric)	0.21 kg
Package weight (imperial)	0.47 lb
Master carton dimension (metric)	38.4 x 30.8 x 58 cm
Master carton dimension (imperial)	15.12 x 12.13 x 22.83 in
Master carton weight (metric)	7.84 kg
Master carton weight (imperial)	17.28 lb

# HP Stereo USB Headset G2

## Messaging Footnotes

<sup>1</sup> Google tested to meet Chromebook compatibility standards.

<sup>2</sup> This product works with devices capable of running the latest version of Chrome OS and has been certified to meet Google's compatibility standards. Google is not responsible for the operation of this product or its compliance with safety requirements. Chromebook and the Works With Chromebook badge are trademarks of Google LLC.



## Sestava mini PC + monitor



# HP Elite Mini 800 G9 Desktop PC

## A desktop that can travel

The HP Elite Mini 800 Desktop PC delivers the high-performance needed to develop complex presentations, crunch big numbers, and quickly create compelling content. Equipped with a powerful Intel® processor<sup>2</sup>, responsive graphics, and smart deployment options, this is the right PC for big jobs done in small spaces.

### Small size. Big impact

Get breakthrough performance with the latest Intel® processor<sup>2</sup> and optional NVIDIA® RTX 3050 Ti graphics<sup>3</sup> that provides the speed and responsiveness needed by multi-taskers. Enjoy an immersive experience on up to eight monitors.<sup>4</sup>

### Office and home deployment

The whisper quiet and ultrasmall HP Elite Mini 800 fits easily into most small bags making it the right choice for desktop users who need to move between the home and office. Mount it behind a compatible HP monitor.<sup>5</sup>

### Protected by HP Wolf Security

HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense. From the BIOS to the browser, above, in, and below the OS, these constantly evolving solutions help protect your PC from modern threats.<sup>6</sup>



\*Product image may differ from actual product

## Sustainability in action

### Help protect our shared future

At least 50 percent of all plastic used in this PC is post-consumer recycled plastic.<sup>7</sup> The outer box packaging is 100 percent sustainably sourced.<sup>8</sup> This PC is ENERGY STAR® certified and EPEAT® registered in 23 countries.<sup>9</sup>



# HP Elite Mini 800 G9 Desktop PC

## Featuring

### Work hard without sounding like it

Focus on work while enjoying whisper quiet operation. The HP Elite Mini 800 utilizes HP Run Quiet Design that finely tunes the fans to keep systems running quiet and cool.

### Agile performance

Quickly access and transfer data to keep up with today's changing business requirements with advanced PCIe Gen 4 SSDs, USB Type-C®, and DDR5 memory.

### Build an ecosystem

Customize your Mini solution with a range of exclusive accessories that secure and mount your Mini and its power supply on a monitor or wall.<sup>10</sup>

### Automatic recovery from firmware attacks

Firmware attacks can completely devastate your PC. Stay protected with HP Sure Start Gen7, the self-healing BIOS that automatically recovers itself from attacks or corruption.<sup>11</sup>

### Keep your PC's security protections in place

Stop unwanted changes to security settings and help limit the spread of malware with HP Sure Run Gen5 which identifies, quarantines, and provides reporting on attackers trying to kill processes.<sup>12</sup>

### Browse confidently

Help protect your PC from websites and read and edit Microsoft Word files and read-only PDF attachments with malware, ransomware, or viruses with hardware-enforced security from HP Sure Click.<sup>13</sup>

### Built-in durability

Rest easy with a PC that undergoes 120,000 hours of HP's Total Test Process and MIL-STD 810 testing. Help extend protection with an optional removable dust filter.<sup>3,14,15</sup>





# HP Elite Mini 800 G9 Desktop PC

## Technical specifications

Available Operating Systems	Windows 11 Pro <sup>1</sup> Windows 11 Pro Education <sup>1</sup> Windows 11 Home - HP recommends Windows 11 Pro for business <sup>1</sup> Windows 11 Home Single Language - HP recommends Windows 11 Pro for business <sup>1</sup> FreeDOS
Processor family	13th Generation Intel® Core™ i9 processor 13th Generation Intel® Core™ i7 processor 13th Generation Intel® Core™ i5 processor 13th Generation Intel® Core™ i3 processor 12th Generation Intel® Core™ i9 processor 12th Generation Intel® Core™ i7 processor 12th Generation Intel® Core™ i5 processor 12th Generation Intel® Core™ i3 processor Intel® Core™ i3 14th generation processor Intel® Core™ i5 14th generation processor Intel® Core™ i7 14th generation processor Intel® Core™ i9 14th generation processor
Available Processors <sup>3,4,5,6</sup>	Intel® Core™ i5-12500T with Intel® UHD Graphics (2.0 GHz P-core base frequency, up to 4.4 GHz P-core Max Turbo frequency, 18 MB L3 cache, 6 P-cores, 12 threads), supports Intel® vPro® Technology Intel® Core™ i5-12400T with Intel® UHD Graphics (1.8 GHz P-core base frequency, up to 4.2 GHz P-core Max Turbo frequency, 18 MB L3 cache, 6 P-cores, 12 threads) Intel® Core™ i3-12300T with Intel® UHD Graphics (2.3 GHz P-core base frequency, up to 4.2 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores, 8 threads) Intel® Core™ i5-12100T with Intel® UHD Graphics (2.2 GHz P-core base frequency, up to 4.1 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores, 8 threads) Intel® Core™ i5-12600 with Intel® UHD Graphics (3.3 GHz P-core base frequency, up to 4.8 GHz P-core Max Turbo frequency, 18 MB L3 cache, 6 P-cores, 12 threads), supports Intel® vPro® Technology Intel® Core™ i5-12500 with Intel® UHD Graphics (3.0 GHz P-core base frequency, up to 4.6 GHz P-core Max Turbo frequency, 18 MB L3 cache, 6 P-cores, 12 threads), supports Intel® vPro® Technology Intel® Core™ i5-12400 with Intel® UHD Graphics (2.5 GHz P-core base frequency, up to 4.4 GHz P-core Max Turbo frequency, 18 MB L3 cache, 6 P-cores, 12 threads) Intel® Core™ i3-12300 with Intel® UHD Graphics (3.5 GHz P-core base frequency, up to 4.4 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores, 8 threads) Intel® Core™ i3-12100 with Intel® UHD Graphics (3.3 GHz P-core base frequency, up to 4.3 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores, 8 threads) Intel® Core™ i5-12600T with Intel® UHD Graphics (2.1 GHz P-core base frequency, up to 4.6 GHz P-core Max Turbo frequency, 18 MB L3 cache, 6 P-cores, 12 threads), supports Intel® vPro® Technology Intel® Core™ i5-12900T with Intel® UHD Graphics (1.8 GHz E-core base frequency, 2.4 GHz P-core base frequency, up to 3.8 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, up to 5.1 GHz with Intel® Turbo Boost Technology, 30 MB L3 cache, 8 P-cores and 8 E-cores, 24 threads), supports Intel® vPro® Technology Intel® Core™ i9-12900T with Intel® UHD Graphics (1.0 GHz E-core base frequency, 1.4 GHz P-core base frequency, up to 3.6 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, up to 4.9 GHz with Intel® Turbo Boost Technology, 30 MB L3 cache, 8 P-cores and 8 E-cores, 24 threads), supports Intel® vPro® Technology Intel® Core™ i7-12700T with Intel® UHD Graphics (1.0 GHz E-core base frequency, 1.4 GHz P-core base frequency, up to 3.4 GHz E-core Max Turbo frequency, up to 4.6 GHz P-core Max Turbo frequency, up to 4.7 GHz with Intel® Turbo Boost Technology, 25 MB L3 cache, 8 P-cores and 4 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i7-12700 with Intel® UHD Graphics (1.6 GHz E-core base frequency, 2.1 GHz P-core base frequency, up to 3.6 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, up to 4.9 GHz with Intel® Turbo Boost Technology, 25 MB L3 cache, 8 P-cores and 4 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i5-14100T with Intel UHD Graphics (2.7 GHz P-core base frequency, up to 4.4 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores, 8 threads) Intel® Core™ i9-13900 (1.5 GHz E-core base frequency, 2.0 GHz P-core base frequency, up to 4.2 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 36 MB L3 cache, 8 P-cores and 16 E-cores, 32 threads), supports Intel® vPro® Technology Intel® Core™ i7-13700 (1.5 GHz E-core base frequency, 2.1 GHz P-core base frequency, up to 4.1 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 30 MB L3 cache, 8 P-cores and 8 E-cores, 24 threads), supports Intel® vPro® Technology Intel® Core™ i5-13500 (1.8 GHz E-core base frequency, 2.5 GHz P-core base frequency, up to 3.5 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i9-13900T with Intel® UHD Graphics 770 (0.8 GHz E-core base frequency, 1.1 GHz P-core base frequency, up to 3.9 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 36 MB L3 cache, 8 P-cores and 16 E-cores, 32 threads), supports Intel® vPro® Technology Intel® Core™ i7-13700T with Intel® UHD Graphics 770 (1.0 GHz E-core base frequency, 1.4 GHz P-core base frequency, up to 3.6 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, up to 4.9 GHz with Intel® Turbo Boost Technology, 30 MB L3 cache, 8 P-cores and 8 E-cores, 24 threads), supports Intel® vPro® Technology Intel® Core™ i5-13500T with Intel® UHD Graphics 770 (1.2 GHz E-core base frequency, 1.6 GHz P-core base frequency, up to 3.2 GHz E-core Max Turbo frequency, up to 4.6 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i3-13100T with Intel® UHD Graphics 730 (2.5 GHz P-core base frequency, up to 4.2 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores, 8 threads) Intel® Core™ i3-14100 (3.5 GHz P-core base frequency, up to 4.7 GHz P-core Max Turbo frequency, 12 MB L3 cache, 4 P-cores and 0 E-cores, 8 threads) Intel® Core™ i5-14600 with Intel UHD Graphics (2.0 GHz E-core base frequency, 2.7 GHz P-core base frequency, up to 3.9 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i9-14900 with Intel UHD Graphics 770 (1.5 GHz E-core base frequency, up to 4.0 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 36 MB L3 cache, 8 P-cores and 16 E-cores, 32 threads), supports Intel® vPro® Technology Intel® Core™ i5-14900T with Intel UHD Graphics (0.8 GHz E-core base frequency, 1.1 GHz P-core base frequency, up to 4.0 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 36 MB L3 cache, 8 P-cores and 16 E-cores, 32 threads), supports Intel® vPro® Technology Intel® Core™ i7-14700T with Intel UHD Graphics (0.9 GHz E-core base frequency, 1.3 GHz P-core base frequency, up to 3.7 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, 33 MB L3 cache, 8 P-cores and 12 E-cores, 28 threads), supports Intel® vPro® Technology Intel® Core™ i5-14600T with Intel UHD Graphics (1.3 GHz E-core base frequency, 1.8 GHz P-core base frequency, up to 3.6 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i5-14500T with Intel UHD Graphics (1.2 GHz E-core base frequency, 1.7 GHz P-core base frequency, up to 3.4 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 20 threads), supports Intel® vPro® Technology Intel® Core™ i5-14400T with Intel UHD Graphics (1.1 GHz E-core base frequency, 1.5 GHz P-core base frequency, up to 3.2 GHz E-core Max Turbo frequency, up to 4.5 GHz P-core Max Turbo frequency, 20 MB L3 cache, 6 P-cores and 4 E-cores, 16 threads)
Chipset <sup>3</sup>	Intel® Q670 (vPro®)
Form factor	Mini
Maximum memory	64 GB DDR5-4800 SDRAM; 64 GB DDR5-5600 SDRAM; <sup>7,8,9</sup> Transfer rates up to 4800 MT/s; Transfer rates up to 5600 MT/s.
Memory slots	2 SODIMM
Internal storage	1TB up to 1TB 7200 rpm SATA <sup>10,39</sup>
Available Graphics	Integrated: Intel® UHD Graphics 730; Intel® UHD Graphics 770 Discrete: NVIDIA® GeForce RTX™ 3050 Ti (4 GB GDDR6 dedicated) <sup>13,14</sup>
Audio	Realtek ALC3252 codec, universal audio jack with CTA and OMTP headset support
Expansion slots	1 M.2 2230; 2 M.2 2280 (1 M.2 2230 slot for WLAN and 2 M.2 2280 slots for storage)
Ports and connectors	Front: 1 headset connector; 1 SuperSpeed USB Type-A 10Gbps signaling rate; 1 SuperSpeed USB Type-A 10Gbps signaling rate (charging); 1 SuperSpeed USB Type-C™ 20Gbps signaling rate ; Rear: 1 external antenna connector; 1 power connector; 1 RJ-45; 3 SuperSpeed USB Type-A 10Gbps signaling rate; 2 DisplayPort™ 1.4; 1 HDMI 2.1 <sup>35</sup> ; Optional Ports: Flex IO port 2 - choose one of the following options: 2 USB 2.0 Type-A 480Mbps signaling rate, 1 serial, 1 second external antenna port; Flex IO port 1 - choose one of the following options: 1 VGA, 1 DisplayPort™ 1.4, 1 HDMI 2.1, 1 SuperSpeed USB Type-C™ 10Gbps signaling rate (100W Power Intake, Alt Mode DisplayPort™), 2 SuperSpeed USB Type-A 5Gbps signaling rate, HP Fiber NIC Port (1Gbps), Intel® 2.5 Gigabit Network Connection LOM, 1 Thunderbolt™ 3 with USB 4.0, 1 serial <sup>12,38</sup>
Input devices	HP USB Business Slim SmartCard CCID Keyboard; HP 125 Wired Keyboard; HP 125 Antimicrobial Wired Keyboard; HP 655 Wireless Keyboard and mouse combo; HP USB 320K Keyboard <sup>15,16</sup> ; HP Wired Desktop 320M mouse; HP 125 Wired Mouse; HP 125 Laser Wired Mouse; HP 125 Antimicrobial Wired Mouse <sup>15</sup>
Communications	LAN: Integrated Intel® I219LM GbE LOM ; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, vPro®; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, non-vPro®; Realtek Wi-Fi 6 RTL8852BE 802.11a/b/g/n/ax (2x2) and Bluetooth® 5.3 wireless card; Intel® Wi-Fi 7 BE200 (2x2) and Bluetooth® 5.4 wireless card, vPro®; Intel® Wi-Fi 7 BE200 (2x2) and Bluetooth® 5.4 wireless card, non-vPro®
Drive Bays	One 2.5" HDD <sup>11</sup>
Environmental	Operating temperature: 10 to 35°C; Operating humidity: 10 to 90% RH
Software	HP Notifications; HP PC Hardware Diagnostics UEFI; HP Support Assistant; HP Connection Optimizer; HP Privacy Settings; HP PC Hardware Diagnostics Windows; HP Desktop Support Utilities; MyHP; HP Easy Clean; Touchpoint Customizer for Commercial; HP Easy Clean Keyboard Driver; HSA Fusion for Commercial; HSA Telemetry for Commercial <sup>17,22,23</sup>
Available software	HP Smart Support <sup>24</sup>
Security management	HP Secure Erase; HP Sure Click; HP Sure Sense; Absolute Persistence module; HP Sure Admin; HP BIOSphere Gen6; HP Client Security Manager Gen7; HP Tamper Lock; HP Sure Start Gen7; HP Sure Run Gen5; HP Sure Recover Gen5; Trusted Platform Module TPM 2.0 Embedded Security Chip shipped with Windows 11 (Common Criteria EAL4+ certified)(FIPS 140-2 Level 2 certified)
Security Software Licenses	HP Wolf Pro Security Edition <sup>56</sup>



# HP Elite Mini 800 G9 Desktop PC

## Technical specifications

Management features	HP Client Catalog (download); HP Driver Packs (download); HP Image Assistant (download); HP Client Management Script Library (download); HP Connect for Microsoft Endpoint Manager; HP Manageability Integration Kit (download); HP Patch Assistant (download) <sup>18,19,20</sup>
Power	120 W external power adapter, up to 89% efficiency, active PFC; 180 W external power adapter, up to 89% efficiency, active PFC; 90 W external power adapter, up to 89% efficiency
Dimensions	17.7 x 17.5 x 3.4 cm; 49.8 x 13.2 x 23.5 cm (Package)
Weight	1.42 kg; (Exact weight depends on configuration.)
Ecolabels	EPEAT registered with Climate+ <sup>17</sup>
Energy star certified	ENERGY STAR® certified
Warranty	1 year (1/1/1) limited warranty includes 1 year of parts, labor and on-site repair. Terms and conditions vary by country. Certain restrictions and exclusions apply.



# HP Elite Mini 800 G9 Desktop PC

## Footnotes

### Messaging Footnotes

<sup>2</sup> 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. Intel's numbering, branding and/or naming is not a measurement of higher performance.

<sup>3</sup> Optional feature that must be configured at the time of purchase.

<sup>4</sup> Eight displays sold separately and only supported on 35W processor model configured with an NVIDIA RTX 3050 Ti graphics card at the time of purchase.

<sup>5</sup> Monitor and mounting hardware sold separately or as an optional feature.

<sup>6</sup> HP Wolf Security for Business requires Windows 10 and higher, includes various HP security features and is available on HP Pro, Elite, Workstation, and RPOS products. See product details for included security features and OS requirements.

<sup>7</sup> Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.

<sup>8</sup> 100% outer box packaging made from sustainably sourced certified and recycled fibers. Fiber cushions made from 100% recycled wood fiber and organic material. Any plastic cushions are made from >90% recycled plastic.

<sup>9</sup> Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. EPEAT® status varies by country. Visit [www.epeat.net](http://www.epeat.net) for more information.

<sup>10</sup> Sold separately or as an optional feature.

<sup>11</sup> HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher.

<sup>12</sup> HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

<sup>13</sup> HP Sure Click requires Windows 10 and higher. See <https://bit.ly/2PrLT6A>, SureClick for complete details.

<sup>14</sup> HP Total Test Process testing is not a guarantee of future performance under these test conditions. Any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

<sup>15</sup> MIL STD 810 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. Any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

### Specification Footnotes

<sup>1</sup> 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 is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com> .

<sup>2</sup> This system is preinstalled with Windows 11 Pro software and provision for recovery software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

<sup>3</sup> For full Intel® vPro® functionality, Windows 11 Pro 64 bit, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or WLAN card and TPM 2.0 are required. Some functionality requires additional 3rd party software in order to run. See <http://intel.com/vpro> .

<sup>4</sup> 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, branding and/or naming is not a measurement of higher performance.

<sup>5</sup> 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.

<sup>6</sup> Only select processors available with each configuration.

<sup>7</sup> For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system. Memory modules support data transfer rates up to 4800 MT/s; actual data rate is determined by the system's configured processor. See processor specifications for supported memory data rate. All memory slots are customer accessible/upgradeable.

<sup>8</sup> All memory slots are customer accessible/upgradeable.

<sup>9</sup> Only available with Alder Lake i5, i7 and i9 Processors.

<sup>10</sup> For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows) of disk is reserved for system recovery software.

<sup>11</sup> Sold separately or as an optional feature.

<sup>12</sup> Fiber NIC and 1Gbps cards would not be available in some selected European countries and Korea.

<sup>13</sup> Only Available on 35W processor.

<sup>14</sup> The card could be configured with the flex IO port 2 as an optional.

<sup>15</sup> HP 125 Antimicrobial Wired Keyboard, HP USB Hardened Mouse, Wired 125 Antimicrobial Mouse are not available in all regions.(Antimicrobial China only)

<sup>16</sup> PS/2 port not available on Elite Mini 800 G9 desktop PCs.

<sup>17</sup> Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit [www.epeat.net](http://www.epeat.net) for more information.

<sup>18</sup> HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.

<sup>19</sup> HP Patch Assistant available on select HP PCs with the HP Manageability Kit that are managed through Microsoft System Center Configuration Manager. HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html> .

<sup>20</sup> HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement> .

<sup>21</sup> myHP requires Windows OS.

<sup>22</sup> HP Support Assistant: Requires Windows and Internet access.

<sup>24</sup> HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights and is available preinstalled on select products, thru HP Factory Configuration Services; or it can be downloaded. For more information about how to enable HP Smart Support or for download, please visit <http://www.hp.com/smart-support> .

<sup>25</sup> 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/> .

<sup>26</sup> HP Sure Click requires Windows 10 Pro or higher or Enterprise. See <https://bit.ly/2PrLT6A>, SureClick for complete details.

<sup>27</sup> HP Sure Sense is available on select HP PCs with Windows 10 Pro, Windows 10 Enterprise, Windows 11 Pro, or Windows 11 Enterprise OS.

<sup>28</sup> HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 and higher.

<sup>29</sup> HP Sure Recover Gen5 with Embedded Reimaging is an optional feature which requires Windows 10 and higher must be configured at purchase. You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module.

<sup>30</sup> HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 and higher

<sup>31</sup> HP Sure Admin requires Windows 10 or higher, HP BIOS, HP Manageability Integration Kit from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.

<sup>32</sup> HP Client Security Manager Gen7 requires Windows and is available on the select HP Elite and Pro PCs.

<sup>33</sup> HP BIOSphere Gen6 features may vary depending on the platform and configuration.

<sup>34</sup> 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™.

<sup>35</sup> The external antenna could be configured with the flex IO port 2 as an optional.

<sup>36</sup> 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.

<sup>37</sup> Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

<sup>38</sup> Platform power consumption varies per configuration, for the best user experience, please connect PC power cord while using USB-C® cable via Super Speed USB Type-C® port in the rear side of the platform.

<sup>39</sup> Starting from November 1st 2023, all shipments will require Windows to be installed on SSD to provide users a better experience. HDD can only be configured as additional data drives and not the boot drive.

<sup>56</sup> HP Wolf Pro Security Edition (including HP Sure Click Pro and HP Sure Sense Pro) is available preloaded on select SKUs and, depending on the HP product purchased, includes a paid 1-year or 3-year license. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: "7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition (HP Sure Sense Pro and HP Sure Click Pro) is effective upon activation and will continue for either a twelve (12) month or thirty-six (36) month license term ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support.



## HP Elite Mini 800 G9

Procesor, operační systém a paměť	
Instalovaný operační systém	<ul style="list-style-type: none"><li>Windows 11 Pro 64-bit</li></ul>
Procesor	<ul style="list-style-type: none"><li>Intel® Core™ i9-12900T (1,40 GHz max. 4,90 GHz, 30 MB mezipaměti, 16 jader) Alder Lake</li></ul>
Čipová sada	<ul style="list-style-type: none"><li>Intel® Q670</li></ul>
Základní deska	<ul style="list-style-type: none"><li>Pacman</li></ul>
Paměť	<ul style="list-style-type: none"><li>32 GB DDR5 4800 MHz (1 × 32 GB)</li></ul>
Paměťové sloty	<ul style="list-style-type: none"><li>2 SODIMM</li></ul>
Maximální paměť	<ul style="list-style-type: none"><li>Možnost rozšíření na 64 GB</li></ul>
Pevné disky a mechaniky	
Pevný disk	<ul style="list-style-type: none"><li>1 TB M.2 SSD PCIe 4x4 NVMe TLC</li></ul>
Optická jednotka	<ul style="list-style-type: none"><li>neobsahuje</li></ul>
Čtečka paměťových karet	<ul style="list-style-type: none"><li>neobsahuje</li></ul>
Pozice interních jednotek	<ul style="list-style-type: none"><li>2× M.2 SSD 2280 (1× obsazená)</li></ul>
Funkce systému	
Grafická karta	<ul style="list-style-type: none"><li>NVIDIA GeForce RTX 3050 Ti (4 GB vyhrazené paměti GDDR6)</li></ul>
Žvuk	<ul style="list-style-type: none"><li>Integrovaná zvuková karta Realtek ALC3252 Interní 2W mono reproduktor</li></ul>
Síťové rozhraní	<ul style="list-style-type: none"><li>Integrovaná síťová karta Intel® I219LM 10/100/1000 Bezdrátová karta Intel® AX211 WiFi 6E (2x2) s Bluetooth 5.2</li></ul>
Porty a konektory	<ul style="list-style-type: none"><li>1× USB-C 3.2 Gen 2x2 (přenosová rychlost signálu 20 Gb/s) 5× USB 3.2 Gen 2 (přenosová rychlost signálu 10 Gb/s) 1× kombinovaný konektor sluchátek/mikrofonu 1× RJ-45 (LAN)</li></ul>
Videokonektory	<ul style="list-style-type: none"><li>2× DisplayPort 1.4 3× mini DisplayPort 1× HDMI 2.1 1× mini HDMI 2.0</li></ul>
Rozšiřující sloty	<ul style="list-style-type: none"><li>2× M.2 2280 PCIe Gen 4x4 pro SSD disk (1× obsazený) 1× M.2 2230 (obsazený - WiFi karta) 1× Flex IO port</li></ul>
Klávesnice	<ul style="list-style-type: none"><li>USB klávesnice HP 320K</li></ul>
Myš	<ul style="list-style-type: none"><li>USB myš HP 128</li></ul>
Rozměry produktu (š x h x v)	<ul style="list-style-type: none"><li>17,7 × 17,5 × 3,4 cm</li></ul>
Hmotnost produktu	<ul style="list-style-type: none"><li>1,42 kg</li></ul>
Provedení	<ul style="list-style-type: none"><li>Mini PC</li></ul>
Požadavky na napájení	<ul style="list-style-type: none"><li>Externí 180 W zdroj s účinností až 89%</li></ul>
Záruka	<ul style="list-style-type: none"><li>3 roky na místě ( 3 roky na místě IČ )</li></ul>

Single CPU Systems

Last updated on the 17th of December 2024

Column

CPU Name	CPU Mark (higher is better)	Rank (lower is better)	CPU Value (higher is better)
Intel Core i9-12900T	30,056	339	61.46

GeForce RTX 3050 Ti Laptop GPU

10139

212

NA

GeForce RTX 3060 8GB

15384

109

NA

GeForce RTX 3060 12GB

18967

86

60.60

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po út st čt p

17:43:27

úterý 17. prosince 2024

### Technical Specifications

#### HP E27q G5 QHD Monitor

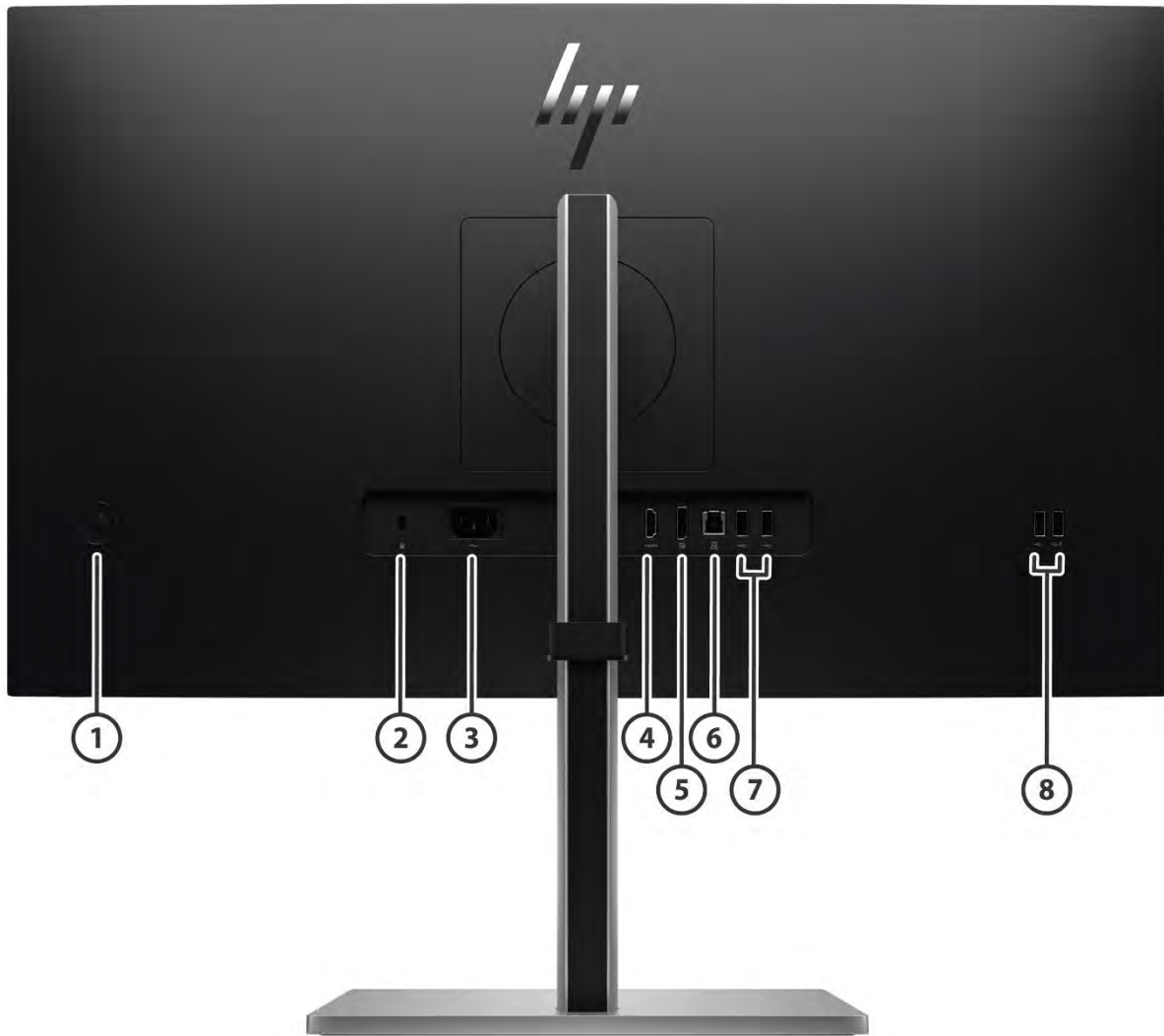


1. Power Button

**Front**  
2. LED Power

### Technical Specifications

#### HP E27q G5 QHD Monitor



1. Joypad OSD button
2. Security Cable Slot
3. Power Connector
4. HDMI 1.4 Port 1.2

#### Back

5. DisplayPort™ 1.2
6. USB-B port
7. SuperSpeed USB Type-A 5Gbps signaling rate (2)
8. SuperSpeed USB Type-A 5Gbps signaling rate (2) 1 charging

Technical Specifications

Model: 6N6F2AA


Panel Specifications	Display Size (Diagonal)	27 inch (68.6 cm)
	Viewable Diagonal Size	27 inch (68.6 cm)
	Panel Technology	IPS
	Max Refresh Rate	75Hz
	Native Resolution	QHD (2560 x 1440)
	Panel Bit Depth	True 8 bit
	Aspect Ratio	16:9
	Brightness (Typical)	350 nits
	Contrast Ratio (Static)	1000:1
	Dynamic Contrast Ratio	8M:1
	Flicker Free	Yes
	Pixel Pitch	0.23 x 0.23 mm
	Pixels Per Inch (PPI)	109 PPI
	Display Colors	Up to 16.7 million colors supported
	Backlight Lamp Life Minimum (To Half Brightness - In Hours)	30k
	Backlight Type	Edge-lit
	Screen Treatment	Anti-glare
	Hardness	3H
	Haze	25%
	Response Time (Typical)	5ms GtG (with overdrive)
	Horizontal Viewing Angle (Typical Cr>10)	178°
	Vertical Viewing Angle (Typical Cr>10)	178°
	Panel Active Area Metric (W X H)	59.67 x 33.57 cm
	Panel Active Area Imperial (W X H)	23.49 x 13.22 in
<b>NOTE:</b> Performance specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.		
Color	sRGB	99%
Color Management	Color Space/ Subsampling Support	RGB 4:4:4, YCBCR 4:4:4, YCBCR 4:2:2
	RGB Channel Adjust	Yes, Gain
	Default Color Temperature	Neutral (6500K)
	Factory Color Calibrated	Yes (Color Temperature)
	Factory Color Presets	Warm - 5000K, Neutral - 6500K, Cool - 9300K
Monitor Specifications	Bezel Type	3-sided borderless
	Color Of Stand	Black & Silver
	Color Of Head	Black
	Tilt	Yes, -5~+20°
	Swivel	±45°
	Pivot	±90°
	Height Adjust Range	150 mm
	Vesa Mounting	100 mm x 100 mm

Technical Specifications

	<b>Security Lock</b>	Security lock-ready
	<b>Detachable Stand</b>	Yes
	<b>Warranty</b>	3/3/0 for LA, NA, EMEA, APJ (3/3/3 in select APJ Countries)
	<b>Low Blue Light</b>	Yes, HP Eye Ease (TÜV Low Blue Light Hardware Solution certified)
	<b>Management Software</b>	HP Display Center, HP Display Manager* <i>*Host PC requires Windows 10 and above. HP Display Center is available on the Microsoft store.</i>
<b>On Screen Display (OSD)</b>	<b>On Screen Display</b>	Brightness+, Color Control, Image Control, Input Control, Power Control, Menu Control, Management, Information, Exit
	<b>Native Resolution</b>	QHD (2560 x 1440) <b>NOTE:</b> DisplayPort 1.2 & HDMI 1.4 required to drive panel at its native resolution.
	<b>Maximum Resolution</b>	QHD (2560 x 1440 @ 75 Hz)
	<b>Preset Graphic Modes/Supported Resolutions</b>	640 x 480 @ 60Hz
		640 x 480 @ 75Hz
		720 x 400 @ 70 Hz
		800 x 600 @ 60 Hz
		800 x 600 @ 75 Hz
		1024 x 768 @ 60 Hz
		1024 x 768 @ 75 Hz
		1280 x 720 @ 50 Hz
		1280 x 720 @ 60 Hz
		1280 x 800 @ 60 Hz
		1280 x 1024 @ 60 Hz
		1280 x 1024 @ 75 Hz
		1440 x 900 @ 60 Hz
		1600 x 900 @ 60 Hz
		1680 x 1050 @ 60 Hz
	<b>Minimum Vertical Scan Rate</b>	50 Hz
	<b>Maximum Vertical Scan Rate</b>	75 Hz
	<b>Minimum Horizontal Scan Rate</b>	30.0 kHz
	<b>Maximum Horizontal Scan Rate</b>	115.0 kHz
	<b>Maximum Pixel Clock</b>	300.0 MHz
	<b>User-Assignable Function Buttons</b>	Yes, 4 (6 options)
	<b>Languages</b>	11 (English, Spanish, German, French, Italian, Netherlands, Portuguese, Japanese, T-Chinese, S-Chinese and Russian)



### Technical Specifications

<b>Connector Types</b>	<b>DisplayPort™</b>	1 DisplayPort™ 1.2
	<b>HDMI</b>	1 HDMI 1.4
	<b>HDCP</b>	Yes, DisplayPort and HDMI
	<b>USB-A</b>	4 SuperSpeed USB Type-A 5Gbps signaling rate (1 charging)
	<b>USB-B</b>	1 USB-B
<b>USB Port Specifications</b>	<b>USB Version</b>	3.2
	<b>USB Hub</b>	Yes
	<b>Downstream Ports</b>	4 Ports
	<b>Upstream Ports</b>	1 USB-B port
	<b>Fast Charging USB Ports</b>	1 Port (Side) USB-A
<b>Special Features</b>	<b>Power Output Maximum</b>	Fast Charging: 7.5W
	<b>SWITCH</b>	Monitor Power button
		Next Active Input/ Up button
		Information / Down button
		Brightness / Left button
<b>Power &amp; Operating Specs</b>		Color / Right button
		Menu / Enter button
	<b>User Presets</b>	18
	<b>Power Supply</b>	Internal
	<b>Power Source</b>	100 – 240 VAC 50/60 Hz
<b>Energy Star Data</b>	<b>Power Consumption- Max</b>	60W
	<b>Energy Saving/Stand By Mode</b>	0.5W
	<b>Power Consumption - Typical</b>	35W
	<b>Operational Mode at 100 VAC</b>	19.87W
	<b>Operational Mode at 115 VAC</b>	19.85W
<b>EU Energy Efficiency Class (ErP LOT-5)</b>	<b>Operational Mode at 230 VAC</b>	20.01W
	<b>On-mode Power Consumption for Standard Dynamic Range (SDR)</b>	21W
	<b>ErP LOT5 Energy Efficiency Class for Standard Dynamic Range (SDR)</b>	
	<b>Operating Temperature - Celsius</b>	5° – 35°C
	<b>Operating Temperature - Fahrenheit</b>	41° – 95°F
<b>Operating Conditions</b>	<b>Non-Operating Temperature - Celsius</b>	–40° – 65°C
	<b>Non-Operating Temperature - Fahrenheit</b>	–40° – 149°F
	<b>Operating Humidity</b>	20 – 80% Relative Humidity (non-condensing)
	<b>Non-Operating Humidity</b>	5 – 95%
	<b>Operating Altitude</b>	0 – 5,000 m (16,400 ft.)
<b>Certifications and</b>	<b>Non-operating Altitude</b>	0 – 12,192 m (40,000 ft.)
	<b>Low Halogen</b>	Yes*

Technical Specifications

Compliances

Agency Approvals and Certifications

Microsoft WHQL Certification  
ENERGY STAR® Certified  
EPEAT® Registered  
Regions need to verify by country

\*External power supplies, WWAN modules, power cords, cables and peripherals excluded.  
WW application  
CE/CB/KC/KCC/NOM/PSB/ICE/TUV-S/ISO 9241-307/cTUVus/GS/ISC/CCC/CEL/CECP/SEPA/TCO/TCO  
Certified Edge/Hardware Low Blue Light/Energy Star/ISC/VCCI/FCC/BSMI/BIS/NRCS/UAE/Ukraine/Ukraine EE/WEEE/TGM/PSE/E-Standby (Korea MEPS)/ EAC  
Win 11 (x64 only), Win 10 (x64 only)  
Yes  
EPEAT® Gold in United States\*

\*Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit <http://www.epeat.net> for more information.  
CEL Grade 2\*  
\*Monitors produced from June 2024 comply with China regulation GB 21520-2023.  
Yes  
Yes  
Yes (NA sku)

China Energy Label

TCO Certified Edge  
TCO Certified  
SmartWay Transport Partnership - NA only

Contains Recycled Plastics

Contains Recycled Plastics

Contains Ocean-Bound Plastic\* 85% ITE-derived closed loop plastic\*\*  
\*All plastic parts contain ocean-bound plastic. Percentage of ocean-bound plastic contained in each component varies by product.  
\*\* ITE Derived Closed Loop Plastic percentage is based on the definition set in the IEEE 1680.1-2018 standard.

Recycled Metals

At least 25% recycled metal\*  
\*Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams.

Recyclable Packaging (Box, packing materials)

Outside Box and corrugated cushions are 100% sustainably sourced and recyclable\*  
Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable\*\*  
\*100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.  
\*\*Molded pulp cushions are made from 100% recycled wood fiber and organic materials.

Unit Product/Package Specifications

Product Dimensions  
(Unpacked with stand) (W x D x H)  
Product Dimensions  
(Packed) (W x D x H)  
Display Head Dimensions  
(Unpacked without stand) (W x D x H)

Metric	Imperial
61.4 x 22.7 x 54.7 cm	24.16 x 9.93 x 21.53 inch
69.9 x 16 x 44.6 cm	27.52 x 6.3 x 17.56 inch
61.34 x 4.83 x 36.46 cm (w/o hinge)	24.16 x 1.9 x 14.35 inch (w/o hinge)
61.34 x 7.45 x 36.46 cm	24.16 x 2.93 x 14.35 inch



Technical Specifications

	<b>Base Area Footprint</b> (w x d mm)	(w/ hinge) 256 x 205 mm	(w/ hinge) 10.08 x 8.07 inch
	<b>Bezel Measurements</b>	Bottom:20.57mm	Bottom: 0.8inch
	<b>Product Weight</b> (Unpacked with stand)	7.08 kg	15.61 lb
	<b>Product Weight</b> (Packed)	11.00 kg	24.24 lb
	<b>Product Weight</b> (Head Only)	4.94 kg (w/o hinge) 5.29 kg (w/ hinge)	10.88 lb (w/o hinge) 11.66 lb (w/ hinge)
<b>Pallet Information</b>	<b>Pallet Dimensions</b> (L x W x H mm)	(20' ft/40' ft) Slip Sheet: 1130 x 709 x 2255 mm (20' ft/40' ft) Pallet: 1130 x 709 x 1926 mm (40' HQ) Slip Sheet: 1130 x 709 x 2255 mm (40' HQ) Pallet: 1130 x 709 x 2375 mm	(20' ft/40' ft) Slip Sheet: 44.49 x 27.91 x 88.78 inch (20' ft/40' ft) Pallet: 44.49 x 27.91 x 75.83 inch (40' HQ) Slip Sheet: 44.49 x 27.91 x 88.78 inch (40' HQ) Pallet: 44.49 x 27.91 x 93.50 inch
	<b>Pallet Total Weight</b>	Slip Sheet: 865 kg (40' ft&20' ft) Slip Sheet: 865 kg (40' HQ) Pallet: 705 kg (40' ft&20' ft) Pallet: 875 kg (40' HQ)	Slip Sheet:1903 lb (40' ft&20' ft) Slip Sheet:1903 lb (40' HQ) Pallet: 1551 lb (40' ft&20' ft) Pallet:1925 lb (40' HQ)
	<b>Pallet Layers</b>	4 layers per pallet (20' ft/40' ft) 5 layers per pallet (40' HQ)	
	<b>Pallet Product per Layer</b>	7 per layer	
	<b>Total Products per Pallet</b>	28 sets per pallet (20' ft/40' ft) 35 sets per pallet (40' HQ)	
	<b>Container Load, 20-Foot</b>	560 sets (slip sheet) 448 sets (pallet)	
	<b>Container Load, 40-Foot</b>	1120 sets (slip sheet) 896 sets (pallet)	
	<b>Container Load, 40-Foot HighQ</b>	1120 sets (slip sheet) 1120 sets (pallet)	
	<b>What's in the box?</b>	AC power cord (1.83m) 5.9ft HDMI 1.4 cable (1.8m) 5.9 ft USB 3.0 B-A cable (1.8m) DP 1.2 cable (1.8m) Warranty Quick Setup Poster	
	<b>User Guide and Warranty Languages</b>	<b>User Guide Languages</b>  Arabic, Bahasa Indonesia, Bulgarian, Chinese-S, Chinese-T, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hebrew, Hungarian, Italian,	

Technical Specifications

Warranty Languages

Japanese, Kazakh, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese (Brazilian), Portuguese (Iberian), Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkey, Ukrainian  
English US (EN), English AP (EN-AP), English LA (EN-LA), English UK (EN-GB), Arabic (AR) -17x, Bahasa Indonesia (ID), Bosnian (BS), Bulgarian (BG), Chinese-S (CN), Chinese-T (TW), Croatian (HR), Czech (CS), Danish (DA), Dutch (NL), Estonian (ET), Finnish (FI), French Canadian (FC), French European (FR), German (DE), Greek (EL), Hebrew (HE), Hungarian (HU), Italian (IT), Japanese (JA), Kazakh (KK), Korean (KO), Latvian (LV), Lithuanian (LT), Norwegian (NO), Polish (PL), Portuguese, Brazilian (BR), Portuguese, Iberian (PT), Romanian (RO), Russian (RU), Serbian (SR), Slovak (SK), Slovenian (SL), Spanish, Castilian (ES-ES), Spanish, Latin America (ES-MX), Swedish (SV), Thai (TH)  
Turkish (TR), Ukrainian (UK), Vietnamese (VI)

### Technical Specifications

#### ENVIRONMENTAL DATA

<b>Eco-Label Certifications &amp; declarations</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• IT ECO declaration</li> <li>• US ENERGY STAR®</li> <li>• US Federal Energy Management Program (FEMP)</li> <li>• EPEAT® Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li> <li>• TCO Certified Edge</li> <li>• China Energy Conservation Program (CECP)</li> <li>• China State Environmental Protection Administration (SEPA)</li> <li>• Taiwan Green Mark</li> <li>• Korea Eco-label</li> <li>• Japan PC Green label*</li> </ul>		
<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"> <li>• 85% ITE – derived closed loop plastic</li> <li>• 5% recycled metal</li> <li>• Low halogen</li> <li>• Outside Box and corrugated cushions are 100% sustainably sourced and recyclable</li> <li>• Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable</li> <li>• Recycled Plastic cushions</li> </ul>		
<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.		
<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Short idle)	20.33 W	20.43 W	20.43 W
Normal Operation (Long idle)	20.33 W	20.43 W	20.43 W
Sleep	0.15 W	0.21 W	0.14 W
Off	0.12 W	0.2 W	0.11 W
	<p><b>NOTE:</b> 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 a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.</p>		
<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Short idle)	69.5 BTU/hr	69.9 BTU/hr	69.9 BTU/hr
Normal Operation (Long idle)	69.5 BTU/hr	69.9 BTU/hr	69.9 BTU/hr
Sleep	0.5 BTU/hr	0.7 BTU/hr	0.5 BTU/hr
Off	0.4 BTU/hr	0.7 BTU/hr	0.4 BTU/hr
	<p><b>*NOTE:</b> Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>		

### Technical Specifications

<b>Longevity and Upgrading</b>	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the		
	Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.		
<b>Additional Information</b>	<ul style="list-style-type: none"> <li>This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>This product is 98.7% recycle-able when properly disposed of at end of life.</li> </ul>		
<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	990 g
		PAPER/Corrugated	790 g
		PAPER/Molded Pulp	570 g
	<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	30 g
	The plastic packaging material contains at least 0.0% recycled content.		
	The corrugated paper packaging materials contains at least 90% recycled content.		
<b>RoHS Compliance</b>	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p> <p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.</p> <p>To obtain a copy of the HP RoHS Compliance Statement, see <a href="#">HP RoHS position statement</a>.</p>		
<b>Material Usage</b>	<p>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 <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</a>):</p> <ul style="list-style-type: none"> <li>Asbestos</li> <li>Certain Azo Colorants</li> <li>Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>Cadmium</li> <li>Chlorinated Hydrocarbons</li> <li>Chlorinated Paraffins</li> <li>Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>Benzyl butyl phthalate (BBP)</li> </ul>		

### Technical Specifications

	<ul style="list-style-type: none"> <li>• Dibutyl phthalate (DBP)</li> <li>• Diisobutyl phthalate (DIBP)</li> <li>• Formaldehyde</li> <li>• Halogenated Diphenyl Methanes</li> <li>• Lead carbonates and sulfates</li> <li>• Lead and Lead compounds</li> <li>• Mercuric Oxide Batteries</li> <li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li> <li>• Ozone Depleting Substances</li> <li>• Polybrominated Biphenyls (PBBs)</li> <li>• Polybrominated Biphenyl Ethers (PBBEs)</li> <li>• Polybrominated Biphenyl Oxides (PBBOs)</li> <li>• Polychlorinated Biphenyl (PCB)</li> <li>• Polychlorinated Terphenyls (PCT)</li> <li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li> <li>• Radioactive Substances</li> <li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li> </ul>
<b>Packaging Usage</b>	<p>HP follows these guidelines to decrease the environmental impact of product packaging:</p> <ul style="list-style-type: none"> <li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li> <li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li> <li>• Design packaging materials for ease of disassembly.</li> <li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li> <li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li> <li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li> <li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li> </ul>
<b>End-of-life Management and Recycling</b>	<p>HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>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: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a>. 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.</p>
<b>HP, Inc. Corporate Environmental Information</b>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report  <a href="http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html">http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html</a></p> <p>Eco-label certifications  <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a></p> <p>ISO 14001 certificates:  <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a>  and  <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf</a></p>

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footnotes	<ul style="list-style-type: none"><li>• Percentage of ocean-bound plastic contained in each component varies by product</li><li>• Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.</li><li>• External power supplies, WWAN modules, power cords, cables and peripherals excluded.</li><li>• 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.</li><li>• Fiber cushions made from 100% recycled wood fiber and organic materials.</li><li>• Plastic cushions are made from &gt;90% recycled plastic.</li><li>• Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams</li></ul>
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### *Technical Specifications*

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ENERGY STAR is a registered trademark owned by the U.S. Environmental Protection Agency.

Summary

Change Log			
January 10, 2023	V1 to V2	Added	Environmental Data
April 12, 2023	V2 to V3	Updated	Color Management section
April 29, 2024	V3 to V4	Updated	China Energy Label
September 4, 2024	V4 to V5	Added	USB Port Specifications

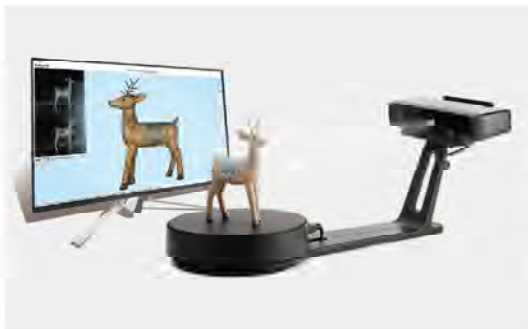


**SHINING 3D®**  
FOR MORE SHINING IDEAS

# EINSCAN-SE/SP DESKTOP 3D SCANNER



# MAXIMIZE THE SCANNING CAPABILITY ON YOUR DESKTOP



## FEATURES

### Wide scan range from small to large

Scanning with turntable by automatic scan or on tripod by manual are available according to the size of objects

### Easy operation, user-friendly workflow and faster scanning

One-click scanning

Automatic calibration without rigid set-up



### Compatible with 3D printers

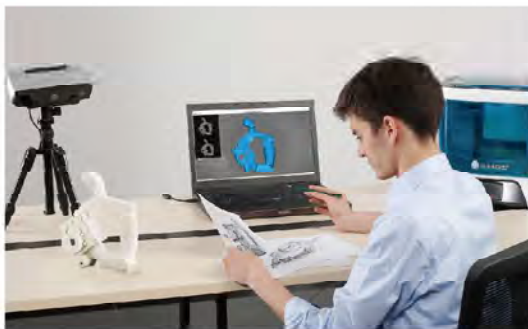
Auto meshing to watertight 3D data for 3D printing

### Fine detail

Reconstruct the geometry of the object with fine detail

### Safety in use

Visible white light, no laser, safe to human eyes



### Scan in color

Easy reconstruct 3D model of the physical objects with color texture

# EINSCAN DISCOVERY PACK

## For EinScan-SE&SP

Making representations of the world in 3D more colorful and accurate.

EinScan Discovery Pack enables users to get higher resolution 3D data in true-color and rich detail.

### True-color

24-bit true-color display

### High-definition camera

12.0 Megapixel color texture

### Rich detail

Scan data resolution reaches up to 3.0 Megapixel per single scan



### EinScan Discovery Pack

Point Distance	0.09-0.12 mm
Texture DPI	12.0 Megapixel
Features	Capture more vibrant color and rich detail
USB	USB 3.0
System Support	Only support Windows
Applicable Devices	EinScan-SE, EinScan-SP
Color Restoration Technology	Ultra-fine™ hardware ISP video processing engine

## EinScan-SE

A powerful companion for educators and individuals

- Provides simple 3D scanning experience for non-technical users
- Wide scan range from small to large
- Easy operation and a high price-to-performance ratio

## EinScan-SP

The expert choice with enhanced experience

- High accuracy better than 0.05mm based on precision calibration in an easy way
- Faster scanning speed
- Multiple align modes
- Make high-resolution 3D modeling accessible to professional users

Model	EinScan-SE	EinScan-SP
Scan Accuracy	0.1 mm (Single Shot Accuracy)	0.05 mm (Single Shot Accuracy)
Scan Speed (single scan time)	<8 s	<4 s
Scan Speed (turntable single lap time)	<2 min	<1 min
Maximum Scan Size	700×700×700 mm	1200×1200×1200 mm
<b>Align Mode</b>		
Manual	√	√
Feature	√	√
Turntable	√	√
Turntable Coded Targets	×	√
Markers	×	√

## APPLICATIONS



### Education

K12 education, vocational school, college and university



### Digital Industry

Animation, CG, VR&AR



### Design & Art

High-quality 3D design, 3D printing applications, reverse engineering



### Archiving and Sharing

3D digital archiving, data sharing

# TECHNICAL SPECIFICATIONS

## EINSCAN-SE

Model	EinScan-SE	
Scan Mode	Fixed Scan with Turntable	Fixed Scan without Turntable
Align Mode	Feature; Manual	Turntable; Manual
Scan Accuracy	≤0.1 mm (Single Shot Accuracy)	
Minimum Scan Volume	30 × 30 × 30 mm	
Maximum Scan Volume	700×700×700 mm	200×200×200 mm
Single Scan Range	200×150 mm	
Scan Speed	Single Scan <8 s	
Point Distance	0.17 mm ~ 0.2 mm	
Texture	Yes	
Output Format	OBJ, STL, ASC, PLY, 3MF	
Camera Resolution	1.3 Mega Pixels	
Light Source	White Light	
Working Distance	290 ~ 480 mm	
Computer Requirements (Required)	USB: 1 ×USB 2.0 or 3.0; OS: Win7, Win8, Win10 (64 bit) / Mac(OS 10.10.9 to 10.12.3); CPU: Dual-core i5; RAM: 8G	
Computer Requirements (Recommended)	Graphics card: Nvidia series; Graphics memory > 1G	
Net Weight	2.5 kg	
Calibration Board	Standard	
Turntable	Standard	
Turntable Loading Capacity	5 kg	

\*Notice: SHINING 3D reserves the right to explain any alteration of the specifications and pictures.



# TECHNICAL SPECIFICATIONS

## EINSCAN-SP

Model	EinScan-SP	
Scan Mode	Fixed Scan with Turntable	Fixed Scan without Turntable
Align Mode	Feature; Markers; Manual	Turntable, Markers, Manual, Turntable Coded Targets
Scan Accuracy	≤0.05 mm (Single Shot Accuracy)	
Minimum Scan Volume	30 × 30 × 30 mm	
Maximum Scan Volume	1200 × 1200 × 1200 mm	200 × 200 × 200 mm
Single Scan Range	200 × 150 mm	
Scan Speed	Single Scan < 4 s	
Point Distance	0.17 mm ~ 0.2 mm	
Texture	Yes	
Output Format	OBJ, STL, ASC, PLY, 3MF, P3	
Camera Resolution	1.3 Mega Pixels	
Light Source	White Light	
Working Distance	290 ~ 480 mm	
Computer Requirements (Required)	USB: 1 × USB 2.0 or 3.0; OS: Win7, Win8, Win10 (64 bit) / Mac(OS 10.10.9 to 10.12.3); CPU: Dual-core i5; RAM: 8G	
Computer Requirements (Recommended)	Graphics card: Nvidia series (GTX 660 or higher) ;Graphics memory > 2G; RAM: 16G	
Net Weight	4.2 kg	
Calibration Board	HD	
Turntable	Turntable with coded targets	
Turntable Loading Capacity	5 kg	

\*Notice: SHINING 3D reserves the right to explain any alteration of the specifications and pictures.



## 3D tiskárna – Original Prusa MK4S



### Technické parametry

#### Rozměry

Maximální rozměry tisku	250 x 210 x 220 mm   9.84 x 8.3 x 8.6 in
Průměr filamentu	1.75 mm
Výška vrstvy	0.05-0.30 mm
Velikost tiskárny (bez cívky)	7 kg, 500×550×400 mm; 19.6×21.6×15.7 in (X×Y×Z)

#### Elektronika

Základní deska	32bitová STM32 základní deska xBuddy
Drivery krokových motorů	Trinamic 2130
Krokové motory	Přesné 0.9° X,Y krokové motory (prevence „VFA“ povrchových vad)

#### Extruder

Extruder	Nextruder, přímý pohon („Direct Drive“), E3D V6 kompatibilní (pomocí adaptéru)
Elektronika extruderu	Speciální rozbočovací deska pro připojení ventilátorů, termistorů a dalších komponentů.
Vedení filamentu	Hliníkový heatsink (chladič), celokovový hotend
Systém pohonu	Nextruder planetová převodovka, poměr 10:1
Chlazení	Vysoce výkonná turbína, 360° chladicí systém
Tryska	Tryska Prusa Nozzle brass CHT - 0.4 mm

#### Max. provozní teplota

Maximální teplota trysky	290 °C / 554 °F
Maximální teplota podložky	120 °C / 248 °F

#### Ovládání

LCD obrazovka	3.5" grafický displej s 65 tisíci barev
Možnosti připojení	NFC přijímač, volitelný ESP Wi-Fi modul (dodávaný s tiskárnou)
Tiskové médium	USB disk / LAN / internet pomocí Prusa Connect

#### Senzory

Pokročilé senzory	Filament senzor, Load Cell senzor, zotavení po ztrátě napájení („Power panic“), 4 vysoce precizní termistory (originální Semitec) + monitoring otáček ventilátorů
<b>Tiskový povrch</b>	
Tiskový povrch	Magnetická podložka s vyměnitelnými tiskovými pláty
<b>Kalibrace</b>	
Kalibrace tiskové podložky	Automatická, Mesh Bed leveling (pouze na tiskové ploše)
<b>Materiály</b>	
Podporované materiály	PLA, PETG, Flex, PVA, PC, PP, CPE, PVB a pokud použijete <a href="#">Original Prusa Enclosure s doplňkovým filtračním systémem</a> tak také ABS, ASA, HIPS nebo PA
<b>Napájení</b>	
Napájecí zdroj	Na míru vyrobený 240W, s hardwarovou podporou pro zotavení po ztrátě energie („power panic“)
Spotřeba energie	PLA: 80W / ABS: 120W

# ClassVR Premium Headset (64GB)

Prémiové náhlavní soupravy pro virtuální a rozšířenou realitu ClassVR nabízejí vše co školy potřebují, aby se virtuální realita stala realitou při výuce ve třídě.



ClassVR je světově nejocetňovanější školní řešení virtuální a rozšířené reality a přichází se vším, co potřebujete k tomu, aby se VR stala realitou ve vaší škole. Nejnovější ClassVR Premium náhlavní souprava (64 GB) obsahuje vylepšenou kapacitu úložiště, výkonnější procesor a RAM, což přinese spolehlivé a efektivní práci s VR / AR ve třídě.

## K dispozici v sadách po 4 a 8 kusech headsetů

Prémiová náhlavní souprava ClassVR přichází s bezpečným a zabezpečeným nabíjením, úložný prostor (box) je navržený tak, být co nejvíce přenosný. To umožní učitelům a studentům snadný přesun z jedné učebny do druhé.

## Pro více informací navštivte:

[www.classvr.com](http://www.classvr.com)



## Kompletní technická specifikace

- 4GB DDR RAM a 64GB vnitřní úložiště
- osmijádrový procesor Qualcomm Snapdragon XR1
- 5,5" LCD displej s rozlišením 2560 x 1440
- 802.11 a/b/g/n dvoupásmová WiFi 2,4/5 GHz + Bluetooth 4.2
- 13MP přední fotoaparát s automatickým ostřením
- Kombinovaná freselová/asférická čočka
- Lithium-polymerová baterie pro minimálně 4 hodinové používání
- USB-C nabíjení/vstup pro ruční ovladač
- 3-směrně nastavitelné uchycení na hlavu se dvěma zadními popruhy
- Slot pro kartu Micro SD pro rozšíření úložiště
- Stereo reproduktory a mikrofon
- 3,5mm stereo jack výstup pro sluchátka

# Virtuální a rozšířená realita ve vašich učebnách



ClassVR je průlomový vzdělávací systém navržený speciálně pro školní výuku, který využívá jak virtuální, tak rozšířenou realitu. Studentům všech věkových kategorií nabízí poutavé, pohlcující zážitky a pomáhá jim porozumět předmětům a tématům prostřednictvím osobní zkušenosti. ClassVR zvyšuje zapojení studentů, posiluje uchování znalostí a celkově podporuje lepší studijní výsledky.

Balíček ClassVR obsahuje sadu samostatných VR / AR headsetů, robustní přenosnou paměťovou jednotku, uživatelské rozhraní uzpůsobené pro studenty, řadu vzdělávacích možností VR, AR & MR v souladu s osnovami, webový portál, který umožňuje učitelům snadno kontrolovat a spravovat zařízení.



Samostatné  
VR headsety



Centrální správa  
headsetů



Bezpečné ukládání  
a nabíjení



Obsahy v souladu  
s osnovami



Instalace  
a školení



# Vše, co potřebujete pro zapojení VR & AR do vaší výuky

## Samostatný headset - není potřeba žádné mobilní zařízení

Headset ClassVR je samostatné zařízení, které je zcela přizpůsobeno pro výuku ve třídě. Na rozdíl od jiných VR headsetů, ClassVR nevyžaduje žádná další zařízení, jako jsou například telefony. Vše je plně integrováno do jednoho zařízení, které je snadno použitelné a vysoce spolehlivé.



## Jednoduché ovládání a správa



Důležitou součástí ClassVR je portál pro učitele, který poskytuje veškerý obsah a nástroje nezbytné k přípravě poutavých lekcí. Online portál ClassVR usnadňuje přesouvání VR a AR obsahů do vlastních portfolií. Jedním kliknutím mohou učitelé obsahy poslat přímo do VR a AR souprav, nasměrovat je na konkrétní body, nebo si prohlédnout, čím se studenti právě zabývají.

## Plán lekcí a obsah pro virtuální, rozšířenou a smíšenou realitu

Naše učební osnovy a strukturované výukové plány pomáhají rozvíjet představivost studentů. Žáci odchází se vzpomínkami a zkušenostmi, které jim pomáhají vizualizovat a chápat i ty nekomplexnější vzdělávací předměty.

V současné době existuje více než 900 předpřipravených aktivit, které pokrývají širokou škálu témat a oborových předmětů. Ponořte studenty do 360-ti stupňových obrázků a videí, přeneste strany učebnic do reality díky AR, nebo si podržte virtuální 3D modely ve vlastních rukách. Buďte kreativní s 360 stupňovými kamerami a 3D modelovacím balíčkem – vytvořte své vlastní obsahy a sdílejte je s celou komunitou ClassVR.



Více než 900  
předpřipravených  
aktivit  
(v anglickém jazyce)



## Profesní rozvoj, školení, implementace a podpora

Online kurzy ClassVR byly navrženy tak, aby vám pomohly dostat co nejvíce z vaší nové investice. Kurzy se skládají z ucelených přednášek s krátkými videy a kvízy, které vám umožní se vzdělávat ve vlastním tempu. Kurzy si můžete kdykoliv zopakovat, osvěžit si tak paměť a zdokonalit své dovednosti (pouze v anglickém jazyce).



# HP EliteBook 660 16 inch G11 Notebook PC

## Empowering the hybrid workforce

The right AI-enhanced PC is essential for any workforce. The secure and easy to manage HP EliteBook 660 provides a wide range of configurable features with the latest Intel® processor<sup>2</sup>, robust memory, and rich collaboration features that allows for easy standardization within existing IT environments.

### Enterprise performance improvements

See more vertical content in a surprisingly small footprint on the 16:10 ratio display that reduces the need to scroll. Enjoy port arrangements, including USB-C® ports, in user friendly locations that allow for a thin chassis design.

### Protected by HP Wolf Security

HP Wolf Security for Business creates a hardware-enforced, always-on, resilient defense. From the BIOS to the browser, above, in, and below the OS, these constantly evolving solutions help protect your PC from modern threats.<sup>3</sup>

### Make connections that matter

Let your audience see you clearly with a hybrid work-ready optional 5MP IR camera.<sup>4</sup> Enjoy crystal-clear audio from AI Noise Reduction<sup>6</sup> and speakers tuned by Poly Studio.



\*Product image may differ from actual product

## Sustainability in action

### Help protect our shared future

Responsible design brings non-backlit keycaps that contain 80-percent post-consumer recycled plastic<sup>7</sup> (PCR) and a resin containing 5-percent ocean-bound expanded polystyrene.<sup>7</sup> Optional backlit keycaps<sup>4</sup> contains 50-percent PCR plastic.<sup>7</sup>



# HP EliteBook 660 16 inch G11 Notebook PC

## Featuring

### Easy battery management

Manage and monitor your battery's performance and condition and customize charging options with the easy-to-use HP Power Manager dashboard.<sup>6</sup>

### Energy consumption meter

Utilize the Energy Consumption Meter that provides power usage tracking<sup>10</sup> and suggestions to reduce energy use, representing the latest in responsible design from HP.

### All at your fingertips

A creative powerhouse that inspires. Take on big projects utilizing multiple applications with the latest Intel® processor<sup>2</sup>, NVIDIA® GeForce RTX™ 2050 graphics<sup>11</sup>, up to 64GB DDR5 memory.<sup>12</sup>

### Speed up the basics of IT management

Help speed up image creation and the management of hardware, BIOS, and security when managing devices through Microsoft Endpoint Manager with the HP Manageability Integration Kit.<sup>13</sup>

### Crisp and clear collaboration

AI Noise Reduction<sup>6</sup> improves collaboration by applying industry-leading noise-filtering technology to all audio input—suppressing incoming and outgoing background noise—providing an enhanced audio-conferencing experience.

### Automatic recovery from firmware attacks

Firmware attacks can completely devastate your PC. Stay protected with HP Sure Start<sup>14</sup>, the self-healing BIOS that automatically recovers itself from attacks or corruption.

### Keep your PC's security protections in place

Stop unwanted changes to security settings and help limit the spread of malware with HP Sure Run<sup>15</sup> which identifies, quarantines, and provides reporting on attackers trying to kill processes.

### Keep visual hackers at bay

Stop shoulder surfers in their tracks with optional HP Sure View<sup>16</sup> that you can quickly activate with one keystroke. When activated, Sure View reduces visual light making it unreadable when the screen is viewed from the side.

### Recovery simplified

HP Sure Recover ensures fast, secure, and automated recovery of the OS over LAN or Wi-Fi® from advanced malware attacks. End users can now pause or retry if the connection is lost<sup>17</sup> and it's corporate image ready for fleet deployments.



# HP EliteBook 660 16 inch G11 Notebook PC

## Technical specifications

Available Operating Systems	Windows 11 Pro <sup>1</sup> Windows 11 Pro Education <sup>1</sup> Windows 11 Home – HP recommends Windows 11 Pro for business <sup>1</sup> Windows 11 Home Single Language – HP recommends Windows 11 Pro for business <sup>1</sup> Windows 11 Pro (Windows 11 Enterprise or Windows 10 Enterprise available with a Volume Licensing Agreement) <sup>1</sup> FreeDOS
Processor family <sup>5</sup>	Intel® Core™ Ultra 5 processor Intel® Core™ Ultra 7 processor
Available Processors <sup>2,3,4,5,12</sup>	Intel® Core™ Ultra 7 165H (Up to 3.8 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 22 threads), supports Intel® vPro® Technology Intel® Core™ Ultra 7 155H (up to 3.8 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 22 threads) Intel® Core™ Ultra 5 135H (Up to 3.6 GHz E-core Max Turbo frequency, up to 4.6 GHz P-core Max Turbo frequency, 18 MB L3 cache, 4 P-cores and 8 E-cores, 18 threads), supports Intel® vPro® Technology Intel® Core™ Ultra 5 125H (up to 3.6 GHz E-core Max Turbo frequency, up to 4.5 GHz P-core Max Turbo frequency, 18 MB L3 cache, 4 P-cores and 8 E-cores, 18 threads) Intel® Core™ Ultra 7 165U (Up to 3.8 GHz E-core Max Turbo frequency, up to 4.9 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-cores, 14 threads), supports Intel® vPro® Technology Intel® Core™ Ultra 7 155U (up to 3.8 GHz E-core Max Turbo frequency, up to 4.8 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-cores, 14 threads) Intel® Core™ Ultra 5 135U (up to 3.6 GHz E-core Max Turbo frequency, up to 4.4 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-cores, 14 threads), supports Intel® vPro® Technology Intel® Core™ Ultra 5 125U (up to 3.6 GHz E-core Max Turbo frequency, up to 4.3 GHz P-core Max Turbo frequency, 12 MB L3 cache, 2 P-cores and 8 E-cores, 14 threads)
Maximum memory	64 GB DDR5-5600 MT/s RAM; (Transfer rates up to 5600 MT/s.) Dual channel support. <sup>6</sup>
Memory slots	2 SODIMM
Internal storage	512 GB PCIe® Gen4x4 NVMe™ M.2 SSD TLC <sup>7</sup> 512 GB up to 1 TB PCIe® Gen4x4 NVMe™ M.2 SED SSD TLC <sup>7</sup> 256 GB up to 512 GB PCIe® NVMe™ M.2 SSD <sup>7</sup>
Display size (diagonal, metric)	40.6 cm (16")
Display <sup>14,15,16,17,18</sup>	40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 400 nits, low power, 100% sRGB with HP Eye Ease; 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 1000 nits, 100% sRGB, HP Sure View Reflect integrated privacy screen with HP Eye Ease; 40.6 cm (16") diagonal, WUXGA (1920 x 1200), touch, IPS, anti-glare, 300 nits, 45% NTSC; 40.6 cm (16") diagonal, WUXGA (1920 x 1200), IPS, anti-glare, 300 nits, 45% NTSC
Available Graphics	Integrated: Intel® Arc™ Graphics; Intel® Graphics <sup>19,44</sup> Discrete: NVIDIA® GeForce RTX™ 2050 Laptop GPU (4 GB GDDR6 dedicated) (Support DX12 and HDMI 2.1.)
Audio	Audio by Poly Studio, dual stereo speakers with discrete amplifiers, integrated dual array microphones
Ports and connectors	2 Thunderbolt™ 4 with USB Type-C® 40Gbps signaling rate (USB Power Delivery, DisplayPort™ 1.4); 2 USB Type-A 5Gbps signaling rate (1 charging, 1 power); 1 HDMI 2.1; 1 stereo headphone/microphone combo jack; 1 RJ-45 ; (HDMI cable sold separately.); Optional Ports: 1 Smartcard reader (optional)
Input devices	Spill-resistant, optional backlit keyboard with DuraKeys <sup>13</sup> ; Clickpad with multi-touch gesture support; Microsoft Precision Touchpad
Communications	(Compatible with Miracast-certified devices.); ; Intel® I219-LM GbE, vPro®; Intel® I219-V GbE, non-vPro® <sup>12</sup> ; ; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, vPro®; Intel® Wi-Fi 6E AX211 (2x2) and Bluetooth® 5.3 wireless card, non-vPro®; ; Qualcomm® 9205 LTE Cat-M1; HP 4000 4G LTE Advanced Pro; ; NFC Mirage WNC XRAV-1 <sup>8,12</sup>
Camera	5 MP camera; IR Camera (select models); FHD camera (select models) <sup>14</sup>
Software	Adobe offer; Buy Office; HP Connection Optimizer; HP Easy Clean <sup>41</sup> ; HP Easy Clean Keyboard Driver; HP MAC Address Manager; Copilot in Windows with Copilot key <sup>48</sup> ; HP PC Hardware Diagnostics UEFI; HP PC Hardware Diagnostics Windows; HP Power Manager <sup>43</sup> ; HP Privacy Settings; HP Services Scan <sup>42</sup> ; HP Smart Support <sup>57</sup> ; HP Support Assistant <sup>21</sup> ; HSA Fusion for Commercial; HSA Telemetry for Commercial; myHP; Miro offer <sup>22</sup>
Security management	HP Client Security Manager; HP Sure Admin <sup>27</sup> ; HP Sure Click <sup>28</sup> ; HP Sure Recover Gen6 <sup>29</sup> ; HP Sure Run Gen5 <sup>30</sup> ; HP Sure Sense; HP Sure Start Gen7 <sup>31</sup> ; HP Tamper Lock <sup>20</sup> ; Secured-Core PC Enable <sup>32</sup> ; TPM 2.0 Embedded Security Chip (Common Criteria EAL4+ Certified) (FIPS 140-2 Level 2 Certified); Absolute Persistence Module <sup>33</sup> ; BIOS Update via Network; HP BIOSphere Gen6 <sup>34</sup> ; HP DriveLock and Automatic DriveLock; HP Secure Erase <sup>35</sup> ; HP Wake on WLAN; Windows Hello Enhanced Sign-in Security (ESS) Enable; Security lock slot <sup>40</sup>
Security Software Licenses	HP Wolf Pro Security Edition <sup>56</sup>
Fingerprint reader	Fingerprint sensor (select models)





# HP EliteBook 660 16 inch G11 Notebook PC

## Technical specifications

Management features	HP Client Catalog (download) HP Cloud Recovery <sup>23</sup> HP Connect for Microsoft Endpoint Manager <sup>24</sup> HP Client Management Script Library (download) HP Driver Packs (download) HP Image Assistant (download) HP Manageability Integration Kit (download) <sup>25</sup> HP Patch Assistant (download) <sup>26</sup>
Memory card device	1 nano SIM (optional)
Power	65 W USB Type-C® adapter; HP 65 W USB Type-C® Halogen-free adapter <sup>39</sup>
Battery type	HP Long Life 3-cell, 56 Wh Li-ion polymer <sup>37</sup> ; Battery is internal and not replaceable by customer. Serviceable by warranty. Fast charging 50% in 30 minutes. <sup>38</sup>
Battery life	Up to 13 hours and 52 minutes
Dimensions	35.94 x 25.1 x 1.7 cm (rear); 35.94 x 25.1 x 1.09 cm (front); (Front height measurement is near the front edge where the chassis bottom cover taper begins. Back height measurement is near the back edge where the chassis bottom cover taper ends.); 2.71 x 19.01 x 12 in 6.9 x 48.3 x 30.5 cm (Package)
Weight	Starting at 1.74 kg; (Weight will vary by configuration. Does not include power adapter.)
Ecolabels	EPEAT® registered configurations available; TCO Certified configurations available; EPEAT® Gold registered in the U.S. <sup>46</sup>
Energy star certified	ENERGY STAR® certified
Certification and compliance	GS Mark; CSA/UL 62368-1; FCC/ICES/CISPR/VCCI; CE Marking; China CCC/SRRC; Taiwan BSMI/NCC; Korea KCC/KC/KES; Ukraine NSoC/TEC; EAEU Compliance; Saudi Arabian Compliance; Low blue light; WW RoHS
Sustainable impact specifications	Low halogen; Bulk packaging available; Molded paper pulp cushion inside box is 100% sustainably sourced and recyclable; Outside box and corrugated cushions are 100% sustainably sourced and recyclable; 20% post-consumer recycled plastic; Ocean-bound plastic in speaker enclosure and system fan; 50% recycled metal <sup>45,47,49,50</sup>
Warranty	1-year warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. Refer to <a href="http://www.hp.com/support/batterywarranty/">http://www.hp.com/support/batterywarranty/</a> 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: <a href="http://www.hp.com/go/cpc">http://www.hp.com/go/cpc</a> .



# HP EliteBook 660 16 inch G11 Notebook PC

## Footnotes

### Messaging Footnotes

<sup>2</sup> 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. Intel's numbering, branding and/or naming is not a measurement of higher performance.

<sup>3</sup> HP Wolf Security for Business requires Windows 10 or 11 Pro and higher, includes various HP security features and is available on HP Pro, Elite, Workstation, and RPOS products. See product details for included security features and OS requirements.

<sup>4</sup> Optional feature must be configured at time of purchase.

<sup>6</sup> Requires the myHP application and Windows OS.

<sup>7</sup> Recycled plastic content percentage is based on the definition set in the IEEE 16801:2018 standard.

<sup>10</sup> Power tracking data expected May 2024. Energy Consumption Meter requires Windows 10 and registration for the Workforce Experience platform at <https://admin.hp.com>. Some features and capabilities may require additional purchase of HP services and/or commercial hardware capable of supporting the HP Insights agent for Windows, Mac, & Android. Activation and restrictions may apply. Select HP Workforce Solutions require an HP Insights agent for Windows, Mac, & Android, available for download at <https://admin.hp.com/software>. For full system requirements and services that require the agent, please visit <https://admin.hp.com/requirements>. The agent collects telemetry and analytics around devices and applications that integrate into the Workforce Experience platform and is not sold as a standalone service. Internet access with connection to the Workforce Experience platform is required. HP follows stringent GDPR privacy regulations, and the platform is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Fleet management requires HP Proactive Insights.

<sup>11</sup> Sold separately or as an optional feature.

<sup>12</sup> Sold separately or as an optional feature. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB (for Windows) of disk is reserved for system recovery software.

<sup>14</sup> HP Sure Start Gen7 is available on select HP PCs and requires Windows 10 Pro and higher.

<sup>15</sup> HP Sure Run Gen5 is available on select HP PCs and requires Windows 10 Pro and higher.

<sup>16</sup> HP Sure Integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

<sup>17</sup> HP Sure Recover Gen5 is available on select HP PCs and requires Windows 10 Pro and higher and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module.

### Specification Footnotes

<sup>1</sup> 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 is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

<sup>2</sup> 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. Intel's numbering, branding and/or naming is not a measurement of higher performance.

<sup>3</sup> Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

<sup>4</sup> Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See [www.intel.com/technology/turboboost](http://www.intel.com/technology/turboboost) for more information.

<sup>5</sup> Features and software that require a NPU may require may require software purchase, subscription or enablement by a software or platform provider, and third party software may have specific configuration or compatibility requirements. Performance varies by use, configuration, and other factors.

<sup>6</sup> Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

<sup>7</sup> For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB of disk is reserved for system recovery software.

<sup>8</sup> Wi-Fi 6E requires a Wi-Fi 6E router, and Windows 11, to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

<sup>9</sup> Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

<sup>10</sup> WWAN module is an optional feature, requires factory configuration and requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, in all regions.

<sup>11</sup> LPWAN (also called Mobile Narrowband) support HP Protect & Trace with Wolf Connect service through the subscription term, but do not support mobile broadband use.

<sup>12</sup> Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See <http://intel.com/vpro>.

<sup>13</sup> Backlit keyboard is an optional feature.

<sup>14</sup> WUXGA/FHD content required to view WUXGA/FHD images.

<sup>15</sup> Resolutions are dependent upon monitor capability, and resolution and color depth settings.

<sup>16</sup> HP Sure View Reflect integrated privacy screen is an optional feature that must be configured at purchase and is designed to function in landscape orientation.

<sup>17</sup> Actual brightness will be lower with touchscreen or Sure View.

<sup>18</sup> All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

<sup>19</sup> Intel® Graphics capabilities require system to be configured with Intel® Core™ Ultra 5 or Ultra 7 processors and dual channel memory. Single channel memory will only function as Intel® ARC graphics.

<sup>20</sup> HP Tamper Lock must be enabled by the customer or your administrator.

<sup>21</sup> HP Support Assistant is available on Windows. For more information, please visit [www.support.hp.com/help/hp-support-assistant](http://www.support.hp.com/help/hp-support-assistant).

<sup>22</sup> HP customers qualify for a 90 day trial of Miro, this offer ends September 2025. Complete terms and conditions are provided by Miro when accepting the offer.

<sup>23</sup> HP Cloud Recovery is available for Z by HP, HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors requires an open network connection. Note: You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: <https://support.hp.com/us-en/document/c0615630>.

<sup>24</sup> HP Connect for Microsoft Endpoint Manager is available from the Azure Market Place for HP Pro, Elite, Z and Point-of-Sale PCs managed with Microsoft Endpoint Manager. Subscription to Microsoft Endpoint Manager required and sold separately. Network connection required.

<sup>25</sup> HP Manageability Integration Kit can be downloaded from <http://www8.hp.com/us/en/ads/clientmanagement/overview.html>.

<sup>26</sup> HP Patch Assistant available on select HP PCs with the HP Manageability Kit that are managed through Microsoft System Center Configuration Manager.

<sup>27</sup> HP Sure Admin requires HP GB or newer platforms, Windows 10 or higher, HP BIOS, HP Manageability Kit or KMS Service from <http://www.hp.com/go/clientmanagement> and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.

<sup>28</sup> HP Sure Click requires Windows 10 and higher. See <https://bit.ly/2P4TL6A>, SureClick for complete details.

<sup>29</sup> HP Sure Recover is available on select HP PCs and requires Windows 10 or 11 and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. HP Sure Recover Gen6 with Embedded Reimaging is an optional feature on select HP PCs which requires Windows 10 or 11 must be configured at purchase. You must back up important files, data, photos, videos, etc. before use to avoid loss of data.

<sup>30</sup> HP Sure Run is available on select HP PCs and requires Windows 10 and higher.

<sup>31</sup> HP Sure Start is available on select HP PCs and requires Windows 10 and higher.

<sup>32</sup> Secured-Core PC Enable requires an Intel® vPro®, AMD Ryzen™ Processor or Qualcomm® processor with SD850 or higher and requires 8 GB or more system memory. Secured-core PC is enabled from the factory.

<sup>33</sup> 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/>

<sup>34</sup> HP BIOSphere features may vary depending on the platform and configuration.

<sup>35</sup> HP Secure Erase implements the methods outlined in the National Institute of Standards and Technology Special Publication 800-88r "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.

<sup>36</sup> HP Fingerprint Reader is an optional feature that requires Windows 10 or 11 and must be configured at purchase.

<sup>37</sup> For new batteries, actual battery Watt-hours (Wh) may differ from the design capacity and may have a full charge capacity that differs by up to 10, which is typical for lithium-ion batteries. Battery capacity naturally decreases over time and with use, depending on several factors such as battery health management settings, shelf life, temperature, environment, loaded apps, features, system configuration, and power settings.

<sup>38</sup> Recharges up to 50% within 30 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. Power adapter minimum of 65 watts required for battery capacities 56Whr or less. Power adapter minimum of 100 watts required for battery capacities greater than 56Whr and less than 83Whr. Power adapter minimum of 120 watts required for battery capacities greater than 83Whr and less than 100Whr. After charging has reached 90% capacity, charging speed will return to normal. Charging time may vary +/-10% due to System tolerance.

<sup>39</sup> Availability may vary by country.

<sup>40</sup> Lock is sold separately.

<sup>41</sup> HP Easy Clean requires Windows 10 RS3 and higher and will disable the keyboard, touchscreen, and clickpad only. Ports are not disabled. See user guide for cleaning instructions.

<sup>42</sup> HP Services Scan is provided with Windows Update on select products and will check entitlement on each hardware device to determine if an HP TechPulse-enabled service has been purchased, and will download applicable software automatically. HP TechPulse is a telemetry and analytics platform that provides critical data around devices and applications. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements>. Not applicable in China.

<sup>43</sup> HP Power Manager requires Windows 10 and higher and can be downloaded from the Microsoft Store. Depending on what version of HP Battery Health Manager (BHM) is available for your device, HP BHM may look at a number of factors to determine how to adjust battery charging over time to optimize battery health. HP BHM is preset to "Let HP Manage my Battery Charging" to allow the system to balance charging between battery health and battery duration. As Let HP Manage My Battery Charging adjusts charge capacity, the amount of run-time on battery will be reduced over time. HP may utilize BIOS updates to adjust BHM settings on select systems to optimize battery health and reduce exposure to those factors that can accelerate battery degradation. To update or change HP BHM settings and for complete details, see [https://support.hp.com/us-en/document/ish\\_4449597-351950716](https://support.hp.com/us-en/document/ish_4449597-351950716)

<sup>44</sup> Hardware acceleration for CODEC H.265/HEVC (High Efficiency Video Coding) is disabled on this platform, including the current configuration and alternate options.

<sup>45</sup> Molded pulp cushions made from 100% recycled wood fiber and organic materials.

<sup>46</sup> Based on US EPEAT® registration according to IEEE 16801:2018 EPEAT®. Status varies by country. Visit [www.epeat.net](http://www.epeat.net) for more information.

<sup>47</sup> External power supplies, power cords, cables and peripherals are not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

<sup>48</sup> Requires Windows 11 and an NPU. Timing of feature delivery and availability varies by market and device. Requires Microsoft account to log in. Where Copilot in Windows is not available, the Copilot key will lead to the Bing search engine. See <http://aka.ms/WindowsAIFeatures>.

<sup>49</sup> 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.

<sup>50</sup> Recycled plastic content percentage is based on the definition set in the IEEE 16801:2018 standard.

<sup>51</sup> HP Wolf Pro Security Edition is available preloaded on select SKUs, and, depending on the HP product purchased, includes a license with a term length communicated to you at purchase and in your order confirmation email. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: 7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition is effective upon 4 months after the date the HP Product was shipped by HP and will continue for the term communicated to you at purchase and in your order confirmation email ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support. Notwithstanding the foregoing, the license shall expire no later than one year after the fixed term of the subject license ends.

<sup>52</sup> HP Smart Support requires the HP agent to be installed. For more information about how to enable or to download HP Smart Support, please visit <http://www.hp.com/smart-support>. HP Services Scan is provided thru Windows Update and will check entitlement on each hardware device to determine if an HP agent-enabled service has been purchased, and will download applicable software automatically. The HP agent is a telemetry and analytics platform that provides critical data around devices and applications and is not sold as a standalone service. HP follows stringent GDPR privacy regulations and is ISO27001, ISO27701, ISO27017 and SOC2 Type2 certified for Information Security. Internet access is required. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements>.



## HP EliteBook 660 G11



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### Procesor, operační systém a paměť

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Instalovaný operační systém	<ul style="list-style-type: none"><li>• Windows 11 Pro 64-bit</li></ul>
Procesor	<ul style="list-style-type: none"><li>• Intel® Core™ Ultra 7 165H (až 5,00 GHz, 24 MB mezipaměti, 16 jader) Meteor Lake</li></ul>
Čipová sada	<ul style="list-style-type: none"><li>• Čipová sada integrovaná s procesorem</li></ul>
Paměť	<ul style="list-style-type: none"><li>• 32 GB DDR5 5600 MHz (2× 16 GB)</li></ul>
Paměťové sloty	<ul style="list-style-type: none"><li>• 2 SODIMM</li></ul>
Maximální paměť	<ul style="list-style-type: none"><li>• Možnost rozšíření na 64 GB</li></ul>

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### Pevné disky a mechaniky

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Pevný disk	<ul style="list-style-type: none"><li>• 1 TB M.2 SSD PCIe Gen 4x4 NVMe TLC</li></ul>
Volný slot na další disk	<ul style="list-style-type: none"><li>• Ne</li></ul>
Optická jednotka	<ul style="list-style-type: none"><li>• neobsahuje</li></ul>

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### Grafické / Audio funkce

---

Grafická karta	<ul style="list-style-type: none"><li>• NVIDIA GeForce RTX 2050 (4 GB vyhrazené paměti GDDR6)</li></ul>
Úhlopříčka displeje	<ul style="list-style-type: none"><li>• 40,6 cm (16,0")</li></ul>
Rozlišení	<ul style="list-style-type: none"><li>• 1 920 × 1 200</li></ul>
Typ monitoru	<ul style="list-style-type: none"><li>• Matný IPS displej, WUXGA rozlišení, AntiGlare 400 nits (cd/m<sup>2</sup>), 100% sRGB Low Blue Light</li></ul>
Zvuk	<ul style="list-style-type: none"><li>• Integrované stereo reproduktory Poly Studio</li></ul>
Web kamera	<ul style="list-style-type: none"><li>• Infračervená 5MP kamera s krytkou a integrovanými duálními digitálními mikrofony Podpora Windows Hello</li></ul>

Konektivita	
Bezdrátové připojení	<ul style="list-style-type: none"><li>• Intel® AX211 WiFi 6E (2x2)</li><li>• Bluetooth 5.3</li></ul>
Síťové rozhraní	<ul style="list-style-type: none"><li>• Integrovaná gigabitová síťová karta Intel® I219-V</li></ul>
Rozšiřující sloty	<ul style="list-style-type: none"><li>• Čtečka karet Smart Card</li></ul>
Porty a konektory	<ul style="list-style-type: none"><li>• 2× USB-C s Thunderbolt 4<ul style="list-style-type: none"><li>- podpora DisplayPort 1.4</li><li>- přenosová rychlost signálu 40 Gb/s</li><li>- napájení notebooku</li></ul></li><li>• 2× USB 3.2 Gen 1</li><li>• 1× kombinovaný konektor sluchátek/mikrofonu</li><li>• 1× HDMI 2.1</li><li>• 1× RJ-45 (LAN)</li></ul>

Další informace	
Klávesnice	<ul style="list-style-type: none"><li>• Podsvícená klávesnice odolná proti politi s numerickou částí</li></ul>
Typ napájení	<ul style="list-style-type: none"><li>• Napájecí adaptér 100 W USB-C</li></ul>
Typ baterie	<ul style="list-style-type: none"><li>• 3člávková lithium-iontová polymerová baterie (56 Wh)</li></ul>
Výdrž baterie	<ul style="list-style-type: none"><li>• 13 hodin a 50 minut</li></ul>
Hmotnost produktu	<ul style="list-style-type: none"><li>• 1,75 kg</li></ul>
Rozměry produktu (š x h x v)	<ul style="list-style-type: none"><li>• 35,94 × 25,10 × 1,70 cm</li></ul>
Materiál	<ul style="list-style-type: none"><li>• Celokovově šasi</li></ul>
Barva	<ul style="list-style-type: none"><li>• Stříbrná (píke silver)</li></ul>
Co je obsaženo v krabici	<ul style="list-style-type: none"><li>• Notebook</li><li>• Napájecí adaptér</li></ul>
Správa zabezpečení	<ul style="list-style-type: none"><li>• Čtečka otisků prstů</li><li>• Hardwarové vypnutí webové kamery</li><li>• Podpora modulu TPM 2.0 (Trusted Platform Module)</li><li>• Slot na bezpečnostní zámek (bezpečnostní zámek je nutné zakoupit zvlášť)</li><li>• HP Tamper Lock</li></ul>
Záruka	<ul style="list-style-type: none"><li>• 3 roky pro spotřebitele ( 3 roky IČ ) s opravou na místě</li></ul>

Single CPU Systems

Last updated on the 17th of December 2024

Column

CPU Name	CPU Mark (higher is better)	Rank (lower is better)	CPU Value (higher is better)
Intel Core Ultra 7 165H	26,163	435	NA

18:00:22

úterý 17. prosince 2024

prosinec 2024

GeForce PCX 5900	34	2362	NA
GeForce RTX 2050	7708	282	NA
GeForce RTX 2060	14145	129	43.59
GeForce RTX 2060 12GB	15931	102	NA

18:03:14

úterý 17. prosince 2024

prosinec 2024

# HPE Aruba Networking 500 Series Campus Access Points

Cost-effective Wi-Fi 6 (802.11ax) for medium-density indoor environments



## Key features

- 1.49 Gbps maximum real-world speed (HE80/HE20)
- WPA3 and Enhanced Open security
- Built-in technology that resolves sticky client issues for Wi-Fi 6 and Wi-Fi 5 devices
- OFDMA for enhanced multi-user efficiency
- IoT-ready Bluetooth 5 and Zigbee support

These affordable Wi-Fi 6 access points provide high-performance connectivity for any organization experiencing growing numbers of mobile, IoT and mobility requirements. With a maximum real-world aggregate data rate of 1.49 Gbps (HE80/HE20), they deliver the speed and reliability needed for venues and workplaces such as schools, midsize offices and retailers.

## Incredible efficiency

The HPE Aruba Networking 500 Series APs are also designed to optimize user experience by maximizing Wi-Fi efficiency and dramatically reducing airtime contention between clients.

Features include Orthogonal frequency-division multiple access (OFDMA), and cellular optimization. With up to 2 spatial streams (2SS) and 80 MHz channel bandwidth (HE80), the 500 Series provides groundbreaking wireless capabilities for budget-conscious deployments.

## Advantages of OFDMA

This capability allows HPE Aruba Networking's APs to handle multiple Wi-Fi 6 capable clients on each channel simultaneously, regardless of device or traffic type. Channel utilization is optimized by handling each transaction via smaller sub-carriers or resource units (RUs), which means that clients are sharing a channel and not competing for airtime and bandwidth.

## Wi-Fi 6 aware client optimization

HPE Aruba Networking's patented AI-powered ClientMatch technology eliminates sticky client issues by placing Wi-Fi 6 capable devices on the best available AP. Session metrics are used to steer mobile devices to the best AP based on available bandwidth, types of applications being used and traffic type — even as users roam.

**HPE Aruba Networking Advanced Cellular Coexistence (ACC)**

This feature uses built-in filtering to automatically minimize the impact of interference from cellular networks, distributed antenna systems (DAS), and commercial small cell or femtocell equipment.

**Intelligent Power Monitoring (IPM)**

HPE Aruba Networking APs continuously monitor and report hardware energy consumption. They can also be configured to enable or disable capabilities based on available PoE power — ideal when wired switches have exhausted their power budget.

**IoT platform capabilities**

Like other HPE Aruba Networking Wi-Fi 6 APs, the 500 Series includes an integrated Bluetooth 5 and 802.15.4 radio (for Zigbee support) to simplify deploying and managing IoT-based location services, asset tracking services, security solutions and IoT sensors. This allows organizations to leverage the 500 Series as an IoT platform, which eliminates the need for an overlay infrastructure and additional IT resources.

**Target Wake Time (TWT)**

Ideal for IoTs that communicate infrequently, TWT establishes a schedule for when clients need to communicate with an AP. This helps improve client power savings and reduces airtime contention with other clients.

**WPA3 and Enhanced Open**

Support for stronger encryption and authentication is provided via the latest version of WPA for enterprise protected networks.

Enhanced Open offers seamless new protection for users connecting to open networks where each session is automatically encrypted to protect user passwords and data on guest networks.

**WPA2-MPSK**

MPSK enables simpler passkey management for WPA2 devices — should the Wi-Fi password on one device or device type change, no additional changes are needed for other devices. Requires ClearPass Policy Manager.

**VPN tunnels**

In Remote AP (RAP) and IAP-VPN deployments, the 500 Series can be used to establish a secure SSL/IPSec VPN tunnel to a Mobility Controller that is acting as a VPN concentrator.

**Trusted Platform Module (TPM)**

For enhanced device assurance, all HPE Aruba Networking APs have an installed TPM for secure storage of credentials and keys, and boot code.

**Simple and secure access**

To simplify policy enforcement, the HPE Aruba Networking 500 Series uses HPE Aruba Networking's Policy Enforcement Firewall (PEF) feature to encapsulate all traffic from the AP to the Mobility Controller (or Gateway) for end-to-end encryption and inspection. Policies are applied based on user role, device type, applications, and location. This reduces the manual configuration of SSIDs, VLANs and ACLs.

**High-density connectivity**

Each 500 Series AP provides connectivity for a maximum of 256 associated clients per radio (512 in total). In real-world scenarios, the maximum recommended client density is dependent on environmental conditions.

**Flexible operation and management**

Our unified APs can operate as standalone access points or with a gateway for greater scalability, security, and manageability. APs can be deployed using Zero Touch Provisioning — without on-site technical expertise — for ease of implementation in branch offices and for remote work.

HPE Aruba Networking APs can be managed using cloud-based or on-premises solutions for any campus, branch, or remote work environment. HPE Aruba Networking Central provides a single pane of glass for overseeing every aspect of wired and wireless LANs, WANs, and VPNs.

AI-powered analytics, end-to-end orchestration and automation, and advanced security features are built natively into the solution.



## Additional Wi-Fi features

Each AP also includes the following standards-based technologies:

<b>Transmit beamforming (TxBF)</b>	Increased signal reliability and range
<b>Passpoint Wi-Fi (release 2) (hotspot 2.0)</b>	Seamless cellular-to-Wi-Fi carryover for guests
<b>Dynamic frequency selection (DFS)</b>	Optimized use of available RF spectrum
<b>Maximum ratio combining (MRC)</b>	Improved receiver performance
<b>Cyclic delay/shift diversity (CDD/CSD)</b>	Greater downlink RF performance
<b>Space-time block coding</b>	Increased range and improved reception
<b>Low-density parity check (LDPC)</b>	High-efficiency error correction for increased throughput
<b>802.11mc fine timing measurement (FTM)</b>	For precision distance ranging

## Technical specifications

Model	AP-504	AP-505
<b>AP type</b>	Indoor, dual radio, 5 GHz and 2.4 GHz 802.11ax 2x2 MIMO	
<b>5 GHz radio</b>	Two spatial stream Single User (SU) MIMO for up to 1.2 Gbps wireless data rate with 2SS HE80 802.11ax client devices	
<b>2.4 GHz radio</b>	Two spatial stream Single User (SU) MIMO for up to 574 Mbps (287 Mbps) wireless data rate with 2SS HE40 (HE20) 802.11ax client devices	
<b>Maximum number of associated client devices</b>	Up to 256 associated client devices per radio	
<b>Maximum number of BSSIDs</b>	16 BSSIDs per radio	
<b>Supported frequency bands (country-specific restrictions apply)</b>	<ul style="list-style-type: none"> <li>• 2.4 GHz and 5 GHz</li> <li>• 2.400 to 2.4835 GHz</li> <li>• 5.150 to 5.250 GHz</li> <li>• 5.250 to 5.350 GHz</li> <li>• 5.470 to 5.725 GHz</li> <li>• 5.725 to 5.850 GHz</li> <li>• 5.850 to 5.895 GHz</li> </ul>	<ul style="list-style-type: none"> <li>• ISM</li> <li>• U-NII-1</li> <li>• U-NII-2A</li> <li>• U-NII-2C</li> <li>• U-NII-3/ISM</li> <li>• U-NII-4</li> </ul>
<b>Available channels</b>	Dependent on configured regulatory domain	
<b>Supported radio technologies</b>	<ul style="list-style-type: none"> <li>• 802.11b: Direct-sequence spread-spectrum (DSSS)</li> <li>• 802.11a/g/n/ac: Orthogonal frequency-division multiplexing (OFDM)</li> <li>• 802.11ax: Orthogonal frequency-division multiple access (OFDMA) with up to 8 resource units</li> </ul>	
<b>Supported modulation types:</b>	<ul style="list-style-type: none"> <li>• 802.11b: BPSK, QPSK, CCK</li> <li>• 802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM (proprietary extension)</li> <li>• 802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM (proprietary extension)</li> <li>• 802.11ax: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM</li> </ul>	
<b>802.11n high-throughput (HT) support:</b>	HT20/40	
<b>802.11ac very high throughput (VHT) support:</b>	VHT20/40/80	
<b>802.11ax high efficiency (HE) support:</b>	HE20/40/80	
<b>Supported data rates (Mbps):</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 11</li> <li>• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54</li> <li>• 802.11n: 6.5 to 300 (MCS0 to MCS15, HT20 to HT40), 400 with 256-QAM</li> <li>• 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2, VHT20 to VHT80), 1,083 with 1024-QAM</li> <li>• 802.11ax (2.4 GHz): 3.6 to 574 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE40)</li> <li>• 802.11ax (5 GHz): 3.6 to 1,201 (MCS0 to MCS11, NSS = 1 to 2, HE20 to HE80)</li> </ul>	



## Technical specifications

Model	AP-504	AP-505
<b>802.11n/ac/ax packet aggregation:</b>	A-MPDU, A-MSDU	
<b>Transmit power:</b>	Configurable in increments of 0.5 dBm	
<b>Maximum (aggregate, conducted total) transmit power (limited by local regulatory requirements):</b>	2.4 GHz band: +21 dBm (18 dBm per chain) 5 GHz band: +21 dBm (18 dBm per chain) Note: conducted transmit power levels exclude antenna gain. For total (EIRP) transmit power, add antenna gain.	

## Wi-Fi antennas

AP-504	AP-505
Two (female) RP-SMA connectors for external dual band antennas (A0 and A1, corresponding with radio chains 0 and 1). Worst-case internal loss between radio interface and external antenna connectors: 0.7 dB in 2.4 GHz and 1.3 dB in 5 GHz.	Two integrated dual-band downtilt omni-directional antennas for 2x2 MIMO with peak antenna gain of 4.9 dBi in 2.4 GHz and 5.7 dBi in 5 GHz. Built-in antennas are optimized for horizontal ceiling mounted orientation of the AP. The downtilt angle for maximum gain is roughly 30 degrees. • Combining the patterns of each of the antennas of the MIMO radios, the peak gain of the combined, average pattern is 4.3 dBi in 2.4 GHz and 5.6 dBi in 5 GHz.

## Other interfaces

Model	AP-504	AP-505
<b>E0: Ethernet wired network port (RJ-45)</b>	<ul style="list-style-type: none"> <li>• Auto-sensing link speed (10/100/1000BASE-T) and MDI/MDX</li> <li>• PoE-PD: 48Vdc (nominal) 802.3af/at PoE (class 3 or 4)</li> <li>• 802.3az Energy Efficient Ethernet (EEE)</li> </ul>	
<b>DC power interface</b>	12 Vdc (nominal, +/- 5%), accepts 2.1 mm/5.5 mm center-positive circular plug with 9.5 mm length	
<b>USB 2.0 host interface (type A connector)</b>	Capable of sourcing up to 1A / 5W to an attached device	
<b>Bluetooth low energy (BLE5.0) and Zigbee (802.15.4) radio</b>	<ul style="list-style-type: none"> <li>• BLE: up to 7 dBm transmit power (class 1) and -93 dBm receive sensitivity (1 Mbps)</li> <li>• Zigbee: up to 6 dBm transmit power and -96 dBm receive sensitivity</li> </ul> Integrated vertically polarized omnidirectional antenna with roughly 30 degrees downtilt and peak gain of 3.3 dBi	
<b>Visual indicators (two multi-color LEDs):</b>	For system and radio status	
<b>Reset button:</b>	Factory reset, LED mode control (normal/off)	
<b>Serial console interface</b>	Proprietary, micro-B USB physical jack	
<b>Security slot</b>	Kensington security slot	

## Power sources and power consumption

Model	AP-504	AP-505
<b>Power sources: The AP supports direct DC power and Power over Ethernet</b>	<ul style="list-style-type: none"> <li>• The AP supports direct DC power and Power over Ethernet</li> <li>• When both DC and PoE power sources are available, DC power takes priority over PoE</li> <li>• Power sources are sold separately; see the 500 Series Ordering Guide for details</li> <li>• When powered by DC or 802.3at (class 4) PoE, the AP will operate without restrictions</li> <li>• When powered by 802.3af (class 3) PoE and with the IPM feature disabled, the AP will disable the USB port. In the same configuration but with IPM enabled, the AP will start up in unrestricted mode, but may dynamically apply restrictions depending on the PoE budget and actual power. The feature restrictions and order can be programmed.</li> </ul>	





## Power sources and power consumption

Model	AP-504	AP-505
Maximum (worst-case) power consumption (without/with a USB device attached):	<ul style="list-style-type: none"><li>• DC powered: 8.9W / 14.2W</li><li>• PoE powered (802.3af): 11.0W / 16.5W</li><li>• PoE powered (802.3af): 11.0W / 13.5W</li><li>• This assumes that up to 5W is supplied to the attached USB device</li></ul>	
Maximum (worst-case) power consumption in idle mode:	4.3W (DC) or 6.2W (PoE)	
Maximum (worst-case) power consumption in deep-sleep mode:	1.7W (DC) or 3.7W (PoE)	

## Mechanical specifications

Model	AP-505
Dimensions/weight (AP-505; unit, excluding mount bracket):	160 mm (W) x 161 mm (D) x 37 mm (H)/500g
Dimensions/weight (AP-505; shipping):	193 mm (W) x 183 mm (D) x 63 mm (H)/645g
Mounting details	A mounting bracket has been pre-installed on the back of the AP. This bracket is used to secure the AP to any of the mount kits (sold separately); see the 500 Series Ordering Guide for details.

## Environmental specifications

Model	AP-504	AP-505
Operating conditions	<ul style="list-style-type: none"><li>• Temperature: 0°C to +50°C / +32°F to +122°F</li><li>• Humidity: 5% to 93% non-condensing</li><li>• AP is plenum rated for use in air-handling spaces</li><li>• ETS 300 019 class 3.2 environments</li></ul>	
Storage and transportation conditions	<ul style="list-style-type: none"><li>• Temperature: -40°C to +70°C / -40°F to +158°F</li><li>• Humidity: 5% to 93% non-condensing</li><li>• ETS 300 019 classes 1.2 and 2.3 environments</li></ul>	

## Reliability

Model	AP-504	AP-505
Mean time between failure (MTBF):	1.3 Mhrs (14.8yrs) at +25°C operating temperature	



## Regulatory and safety compliance

Model	AP-504	AP-505
<b>Regulatory model numbers</b>	APIN0504	APIN0505
<b>Minimum OS release</b>	<ul style="list-style-type: none"> <li>• HPE Aruba Networking Wireless Operating System and HPE Aruba Networking InstantOS 8.6.0.0</li> <li>• HPE Aruba Networking Wireless Operating System 10.1.0.0</li> </ul>	
<b>Regulatory compliance</b> (For more country-specific regulatory information and approvals, please see your HPE Aruba Networking representative.)	<ul style="list-style-type: none"> <li>• FCC/ISED</li> <li>• CE Marked</li> <li>• RED Directive 2014/53/EU</li> <li>• EMC Directive 2014/30/EU</li> <li>• Low Voltage Directive 2014/35/EU</li> <li>• UL/IEC/EN 62368-1</li> <li>• EN 60601-1-1, EN60601-1-2</li> </ul>	
<b>Certifications</b>	<ul style="list-style-type: none"> <li>• Railway Certs (AP-505 only):               <ul style="list-style-type: none"> <li>– EN 50155:2017 — Railway Applications</li> <li>– EN 50121-1:2017 — Railway EMC</li> <li>– EN 50121-3-2 — Railway EMC</li> <li>– EN 50121-4:2016 — Railway Immunity</li> <li>– IEC 61373 ed2:2008 — Railway Shock and Vibration</li> </ul> </li> <li>• UL2043 plenum rating</li> <li>• Wi-Fi Alliance:               <ul style="list-style-type: none"> <li>– Wi-Fi CERTIFIED a, b, g, n, ac</li> <li>– Wi-Fi CERTIFIED 6 (ax)</li> <li>– WPA, WPA2 and WPA3 — Enterprise with CNSA option, Personal (SAE), Enhanced Open (OWE)</li> <li>– WMM, WMM-PS, W-Fi Agile Multiband</li> <li>– Wi-Fi CERTIFIED Location™</li> </ul> </li> <li>• Bluetooth SIG</li> <li>• Ethernet Alliance (PoE, PD device, class 4)</li> </ul>	



## RF performance table

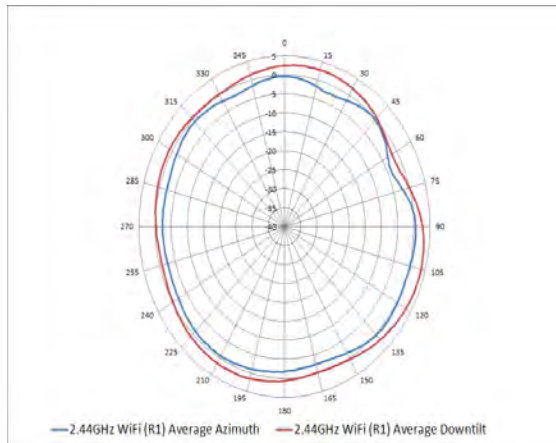
Band, rate	Maximum transmit power (dBm) per transmit chain	Receiver sensitivity (dBm) per receive chain
<b>2.4 GHz, 802.11b</b>		
1 Mbps	18	-98
11 Mbps	18	-90
<b>2.4 GHz, 802.11g</b>		
6 Mbps	18	-93
54 Mbps	18	-76
<b>2.4 GHz, 802.11n HT20</b>		
MCS0	18	-93
MCS7	16	-75
<b>2.4 GHz, 802.11ax HE20</b>		
MCS0	18	-93
MCS11	14	-62
<b>5 GHz, 802.11a</b>		
6 Mbps	18	-92
54 Mbps	18	-75
<b>5 GHz, 802.11n HT20</b>		
MCS0	18	-92
MCS7	16	-74
<b>5 GHz, 802.11n HT40</b>		
MCS0	18	-90
MCS7	16	-71
<b>5 GHz, 802.11ac VHT20</b>		
MCS0	18	-92
MCS9	16	-69
<b>5 GHz, 802.11ac VHT40</b>		
MCS0	18	-90
MCS9	16	-65
<b>5 GHz, 802.11ac VHT80</b>		
MCS0	18	-87
MCS9	16	-62
<b>5 GHz, 802.11ax HE20</b>		
MCS0	18	-93
MCS11	14	-62
<b>5 GHz, 802.11ax HE40</b>		
MCS0	18	-90
MCS11	14	-59
<b>5 GHz, 802.11ax HE80</b>		
MCS0	18	-87
MCS11	14	-56



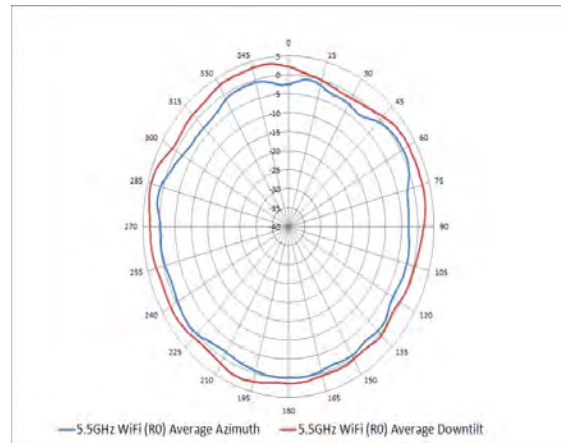
## Antenna patterns

### Horizontal planes (top view)

Showing azimuth (0 degrees) and 30 degrees downtilt patterns (averaged patterns for all applicable antennas)



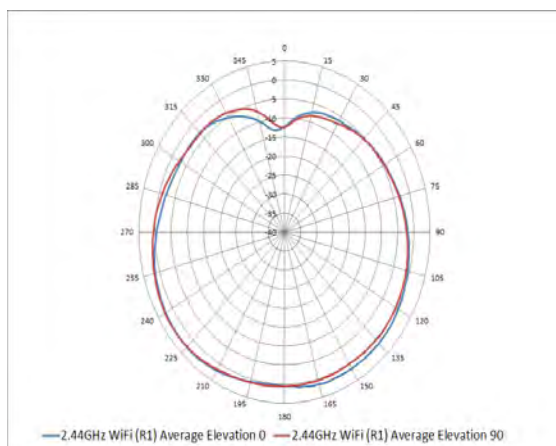
2.44 GHz Wi-Fi (antennas 1, 2)



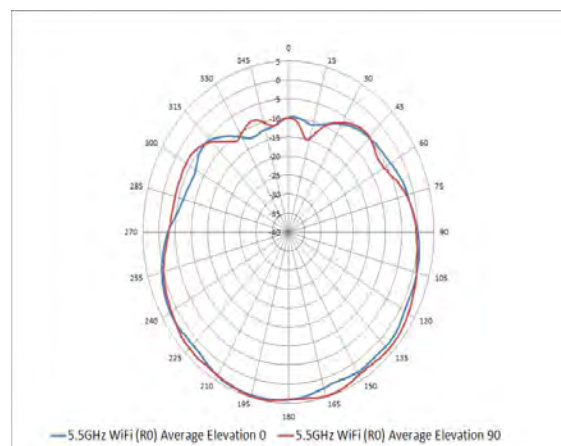
5.5 GHz Wi-Fi (antennas 1, 2)

### Vertical (elevation) planes (side view, AP facing down)

Showing side view with AP rotated 0 and 90 degrees (averaged patterns for all applicable antennas)



2.44 GHz Wi-Fi (antennas 1, 2)




5.5 GHz Wi-Fi (antennas 1, 2)



Ordering information

Part number	Description
HPE Aruba Networking 500 Series Campus Access Points	
Internal antenna access points	
R2H25A	HPE Aruba Networking AP-505 (EG) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H26A	HPE Aruba Networking AP-505 (IL) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H27A	HPE Aruba Networking AP-505 (JP) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H28A	HPE Aruba Networking AP-505 (RW) Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
Internal antenna access points (eco-friendly 10-packs)	
S3J27A	HPE Aruba Networking AP-505 (RW) Dual Radio 2x2 Wi-Fi 6 10-Pack Campus Access Point
S3J28A	HPE Aruba Networking AP-505 (US) Dual Radio 2x2 Wi-Fi 6 10-Pack Campus Access Point
External antenna access points	
R2H19A	HPE Aruba Networking AP-504 (EG) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H20A	HPE Aruba Networking AP-504 (IL) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H21A	HPE Aruba Networking AP-504 (JP) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H22A	HPE Aruba Networking AP-504 (RW) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H23A	HPE Aruba Networking AP-504 (US) Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
Internal antenna access points — TAA models	
R2H35A	HPE Aruba Networking AP-505 (EG) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H36A	HPE Aruba Networking AP-505 (IL) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H37A	HPE Aruba Networking AP-505 (JP) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H38A	HPE Aruba Networking AP-505 (RW) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
R2H39A	HPE Aruba Networking AP-505 (US) TAA Dual Radio 2x2:2 802.11ax Internal Antennas Unified Campus AP
External antenna access points — TAA models	
R2H30A	HPE Aruba Networking AP-504 (EG) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H31A	HPE Aruba Networking AP-504 (IL) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H32A	HPE Aruba Networking AP-504 (JP) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H33A	HPE Aruba Networking AP-504 (RW) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
R2H34A	HPE Aruba Networking AP-504 (US) TAA Dual Radio 2x2:2 802.11ax External Antennas Unified Campus AP
For compatible accessories, see the <a href="#">500 Series Wireless Access Points ordering guide</a>	

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 **Chat now (sales)**

# HPE Aruba Networking CX 6100 Switch Series

HPE Aruba Networking CX 6100 48G 4SFP+ Switch (JL676A)



## What's new

- Simplify IT operations with next-gen Layer 2 switch series that provides entry level, reliable, and convenient wired access connectivity.
- Right size with 12, 24, and 48 port 1U models with convenient built-in 1/10 GbE uplinks and up to 740W of Class 4 PoE.
- Silent deployment with compact and fanless 12 port PoE model.
- Flexibility to manage and simplify configurations with Aruba Central, Aruba NetEdit, easy to use Web GUI, or industry standard CLI.
- Software defined ready with REST APIs.
- Layer 2 feature set with static routing and switch software embedded with no

## Overview

The HPE Aruba Networking CX 6100 Switch Series is a modern family of entry level access switches ideal for branch offices, mid-market enterprise, and SMB networks. Designed for reliable, simple, and secure access, the HPE CX 6100 switches provide a convenient wired access solution for enterprise networks supporting IoT, mobile, and cloud applications.

Prepare your network for tomorrow's unpredictable demands with a powerful Aruba ASIC architecture and programmable AOS-CX operating system used across the HPE Aruba CX portfolio to deliver a more consistent, more efficient operator experience. This layer 2 switch series has convenient built-in high speed uplinks with up to 740W of IEEE 802.3at Class 4 PoE to support IoT devices such as security cameras and wireless APs. A compact and fanless 12 port model is ideal for use in quiet work spaces. With robust QoS, support for static routing, and IPv6, the HPE CX 6100 also simplifies ownership with no switch software licensing requirements.

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subscription required to enable.

## Features

### Entry Level Aruba CX Access Layer Switches

The HPE Aruba Networking CX 6100 Switch Series offers gigabit connectivity with high speed uplinks and optional PoE to provide entry level, reliable, and convenient wired access connectivity for enterprise branch office and SMB networks.

Using Aruba AOS-CX operating system across HPE Aruba Networking CX switching platforms and deployment domains provides a simpler, more consistent operator experience.

Fully-managed enterprise class switches deliver Layer 2 capabilities with support static routing, ACLs, robust QoS, traffic prioritization, sFlow, and IPv6 support.

Right size deployment with choice of 12, 24, and 48 port 1U models with convenient built-in 1/10 GbE uplinks and up to 740W of Class 4 PoE.

Simplifies ownership with no switch software licensing or subscriptions required.

### Performance and Power

The HPE Aruba Networking CX 6100 Switch Series is designed with Aruba ASICs that deliver very low latency, increased packet buffering, and adaptive power consumption.

Deploy wireless access points and IoT devices with HPE Aruba Networking CX 6100 switch models that support up to 740W IEEE 802.3at Class 4 Power over Ethernet for up to 30W per port.

Four built-in wire speed 1/10GbE uplinks eliminate bottlenecks at the access layer where users and devices connect.

### Simplified Configuration and Management

The HPE Aruba Networking CX 6100 Switch Series provides flexibility to manage and simplify configurations with Aruba Central, Aruba NetEdit, easy to use Web GUI, or industry standard CLI.

Aruba NetEdit introduces automation that allows for rapid network-wide changes and verifies policy conformance post network updates.

Manage via single pane of glass with Aruba Central across wired, wireless, and WAN.

Reduce manual IT operation tasks around initial deployment or on-going configuration changes to accommodate adds, moves, and changes with colorless ports using local user roles and local-MAC-Authentication (LMA).

Software-defined ready with REST APIs for fine-grained programmability of network tasks.



Technical specifications

HPE Aruba Networking CX 6100 48G 4SFP+ Switch

Product Number	JL676A
Differentiator	The Aruba CX 6100 Switch Series delivers entry level, reliable, and convenient Layer 2 wired access connectivity ideal for branch offices, mid-market enterprise, and SMBs. This model has 48x 10/100/1000BASE-T and 4x 1G/10G SFP ports.
Ports	48x ports 10/100/1000BASE-T ports 4x 1G/10G SFP ports
Memory and processor	Dual Core ARM Cortex A9 @ 1016 Mhz 4 GB DDR3, maximum, depending on model 16 GB eMMC
Latency	1 Gbps: 1.9 µSec , 10 Gbps: 1.8 µSec
Throughput	98.6 Mpps
Switching capacity	176 Gbps
PoE capability	370W, maximum, depending on model
Input voltage	100-127 VAC / 200-240 VAC
Power consumption	Max Power: 44.2W
Product dimensions (metric)	4.4 x 44.2 x 24.7 cm
Weight	3.4 kg





For additional technical information, available models and options, please reference the [QuickSpecs](#)

## HPE Aruba Networking Services

HPE Aruba Networking services simplify and accelerate the network technology lifecycle, enabling your network to scale with better predictability and cost-effectiveness. Whether you operate your own network and need to improve your IT efficiencies, or you want to offload some of the burden, we have the services you need to reach your goals.

Learn more about what HPE Services - Aruba Networking has to offer at: <https://www.hpe.com/edge/services>

### Support Services

Our support portfolio provides the essential support elements as well as proactive and preventive features to help you improve your team's productivity and get the most from your network. Our support customers benefit from faster issue resolution, simplified operations and efficiencies, and reduced network issues.

### Professional Services

With deep intellectual capital and purpose-built tools, our team delivers a range of standard and custom professional services designed to accelerate your value from HPE Aruba Networking technology.

#### Project based services include:      Annual subscription services include:

- Planning, audit, and assessment
- Architecture review and design
- Deployment, migration, and knowledge transfer
- Network optimization
- Intelligent Operations
- Customer Experience Management

Our [Education Services](#) allow your team to come up to speed quickly.

### HPE GreenLake for Networking

Our NaaS solution, is part of the HPE GreenLake services family, and simplifies network operations, accelerates equipment handling, and increases the value of your HPE Aruba Networking solution. If you need expert guidance and automation-based operations for your team, please explore our NaaS approach through HPE GreenLake for Networking.

**Make the right purchase decision.  
Contact our presales specialists.**



Contact us

Visit [ArubaNetworks.com](https://www.arubanetworks.com)



# EH-LS650B



Bring home entertainment to life and project up to 120". This stylish 4K PRO-UHD<sup>1</sup> Smart laser projection TV, is part of the expanding EpiqVision Ultra range that comes with Android TV™ and sound by YAMAHA.

Upgrade your home entertainment experience with Epson's 4K PRO-UHD<sup>1</sup>, ultra-short-throw laser projection TV. Its stylish design will fit perfectly into your home, and you can immerse yourself in your favourite shows with Android TV and sound by YAMAHA features. You can enjoy a 61" image from just 3.2cm away from the wall, with the option to adjust the distance to achieve up to 120", for the ultimate home cinema experience.

## The big screen experience

Feel immersed in everything you watch or play with this stylish and affordable 4K PRO-UHD<sup>1</sup> projector which can produce up to a 120" image placed close to the wall. Bringing the screen to life, 3LCD technology achieves a display that is up to three times brighter than competitor products<sup>2</sup>. Ideal for gaming, with under 20ms<sup>3</sup> lag time.

## Smart home entertainment

Android TV offers thousands of movies, shows and games from Google Play, Amazon Prime Video, YouTube and other favourite apps<sup>4</sup>. Built in speakers with sound by YAMAHA produce a stunning dynamic audio and 3D surround sound, which can be used with and without visual display. Simply select the visual display to mute, or you can connect via Bluetooth to use as a standalone speaker to play your favourite music.

## Long-lasting solution

Looking for a long-term, hassle-free and affordable solution to replace your TV? With this model's long-lasting laser light source, you'll be able to enjoy entertainment for up to 10 years<sup>5</sup>.

## Superior picture quality

With a high brightness of 3,600 lumens and contrast ratio of 2,500,000:1, this 4K PRO-UHD<sup>1</sup>, HDR10 projector delivers lifelike content and defined shadow detail. Epson's 3LCD technology means its projectors have up to three times brighter colours, than comparable 1-chip DLP projectors<sup>2</sup>. Our Epson Setting Assistant app, makes life even easier to set up your new projector, as you can align the image automatically, with just a click of a button.

## DATASHEET / BROCHURE



## KEY FEATURES

- **4K PRO-UHD<sup>1</sup> Smart laser projection TV**  
Supersize your favourite films, games and sporting events at home
- **Smart entertainment**  
EpiqVision Ultra range with Android TV and sound by YAMAHA
- **Long-lasting solution**  
Enjoy entertainment for up to 10 years<sup>5</sup>
- **Affordable and flexible**  
Project up to 120" close to the wall
- **Impressive, bright display**  
Equally high White and Colour Light Output of 3,600 lumens



# EPSON®

## PRODUCT SPECIFICATIONS

### TECHNOLOGY

Projection System	3LCD Technology, RGB liquid crystal shutter
LCD Panel	0,62 inch with C2 Fine

### IMAGE

Color Light Output	3.600 Lumen- 1.800 Lumen (economy) In accordance with IDMS15.4
White Light Output	3.600 Lumen - 1.800 Lumen (economy) In accordance with ISO 21118:2020
Resolution	4K PRO-UHD
High Definition	4K enhancement
Aspect Ratio	16:9
Contrast Ratio	2.500.000 : 1
Light source	Laser
Colour Video Processing	10 Bits
2D Vertical Refresh Rate	192 Hz - 240 Hz
Colour Reproduction	Upto 1.07 billion colours
HDR support	HDR10, HLG

### OPTICAL

Throw Ratio	0,25 - 0,62:1
Zoom	Digital, Factor: 1 - 2,5
Lens	Optical
Screen Size	60 inches - 120 inches
Projection Distance Wide	0,4 m ( 77 inch screen
Projection Lens F Number	1,6
Projection Lens Focal Length	3,7 mm
Offset	5 : 1

### CONNECTIVITY

Interfaces	USB 2.0-A (3x), USB 2.0 Type B (Service Only), Wireless LAN IEEE 802.11a/b/g/n/ac, Bluetooth (optional), HDMI ARC, HDMI (HDCP 2.3) (2x), Remote
Epson iProjection App	n/a

### ADVANCED FEATURES

Security	Kensington lock
2D Colour Modes	Dynamic, Natural, Cinema, Vivid
Other features	4K enhancement, Android TV, Arc Correction, Chromecast, Fit to Screen, Frame interpolation, Google Search, Instant on/off, Long light source life, Point correction, Quick Corner, Sound by Yamaha
Video Color Modes	Cinema, Dynamic, Natural, Vivid

### GENERAL

Power consumption	234 Watt - On mode power consumption (Normal) 264 Watt (Peak), 178 Watt (Eco)
Heat Dissipation	897,6 BTU/hour (max)
Supply Voltage	AC 100 V - 240 V, 50 Hz - 60 Hz
Product dimensions	467 x 400 x 153 mm (Width x Depth x Height)
Product weight	7,4 kg
Noise Level	Normal: 36 dB (A) - Economy: 23 dB (A)
Supported Temperature	Operation 5° C - 35° C, Storage -10° C - 60° C
Supported Humidity	Operation 20% - 80%
Options	Air filter
Compatible Operating Systems	Android
Loudspeaker	20 Watt
Room Type / Application	4K Gaming, 4K Streaming, Gaming, Home Cinema, Sports, Streaming, TV & Box sets
Positioning	Floor, TV Cabinet
Colour	Black

### OTHER

Warranty	60 months Carry in or 12.000 h
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## EH-LS650B

## WHAT'S IN THE BOX

- Power cable
- Warranty document
- User guide
- Batteries for Remote Control
- Remote control excl. batteries

## OPTIONAL ACCESSORIES

- Air Filter - ELPAF60 - EB-7XX / EB-L2xx Series  
V13H134A60
- Laser TV 100" ALR Screen - ELPSC35  
V12H002AD0
- Laser TV 120" ALR Screen - ELPSC36  
V12H002AG0

## LOGISTICS INFORMATION

SKU	V11HB07140
EAN code	8715946718453
Country of Origin	Philippines

## EH-LS650B



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Handelsmerken en geregistreerde handelsmerken zijn het eigendom van Seiko Epson Corporation of de respectieve eigenaars. Productinformatie kan zonder voorafgaande kennisgeving worden gewijzigd.

1. 4K Enhancement Technology shifts each pixel diagonally to double Full HD resolution. Resolution is Full HD in 3D Mode.
2. Colour brightness(colour light output) in brightest mode, measured by a third-party lab in accordance with IDMS 15.4. Colour brightness will vary depending on usage conditions. Top-selling Epson 3LCD projectors versus top selling 1-chip DLP projectors based on NPD sales data for October 2019 through September 2020.
3. There is no official standard for Input Lag measurement and this measurement is made based on the method set by Epson. Please note, each manufacturer measures Input Lag independently according to their own methods and therefore it is recommended to use as reference. Projector input lag varies in consequences of a difference of input signal, setting conditions and so on.
4. Android TV™; Google, Android, YouTube, Android TV and other marks are trademarks of Google LLC. Subscriptions may be required for certain content providers.
5. Based on watching content for 5 hours every day with the projector on eco mode.

**EPSON®**

