Dell Precision 7740

Technical Guidebook

Regulatory Model: P34E
Regulatory Type: P34E002

Notes, cautions, and warnings

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

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

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

2019 - 05

Rev. A00

Contents

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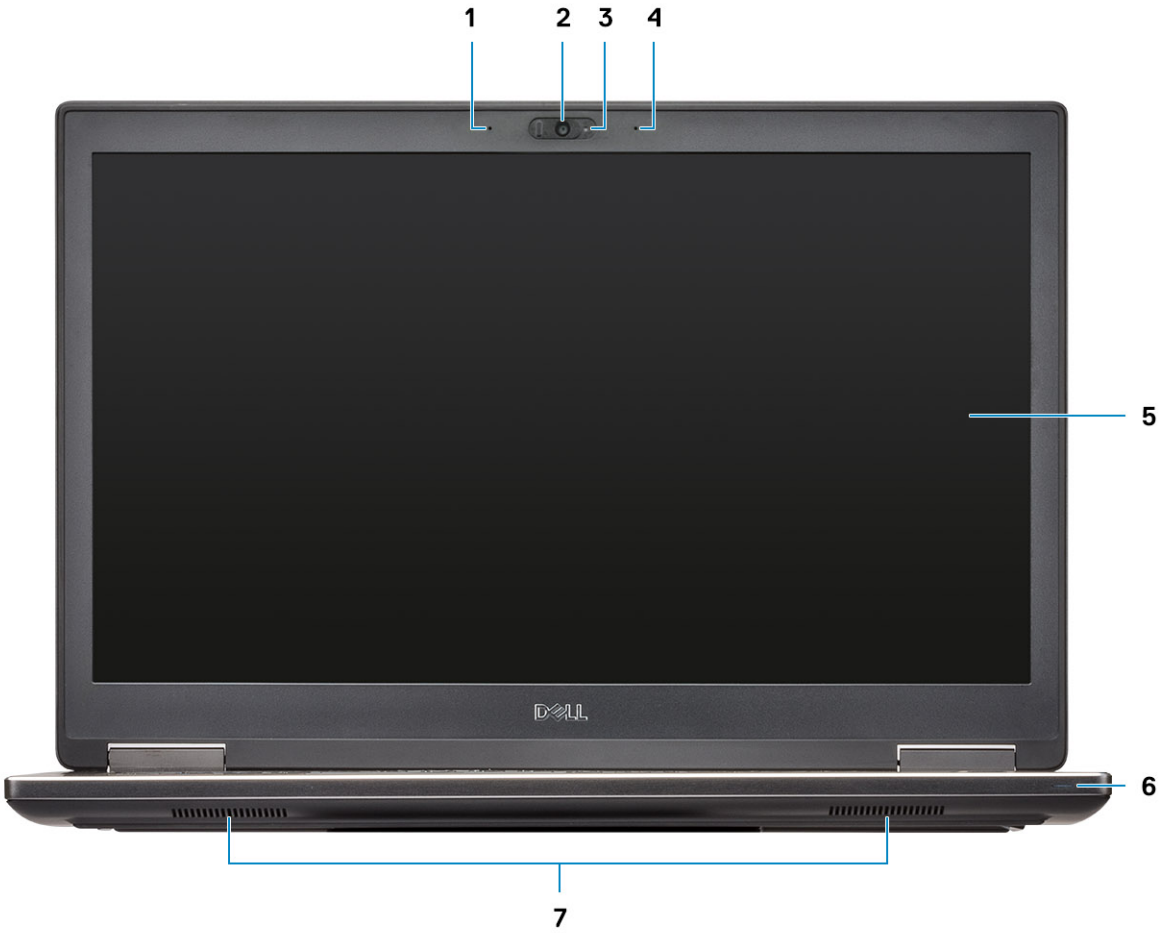
Chassis overview

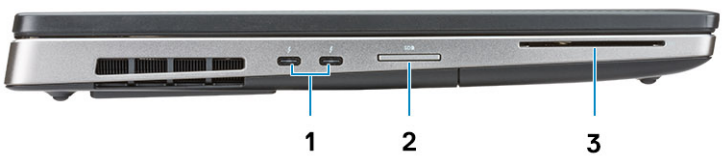
Topics:

Front open view



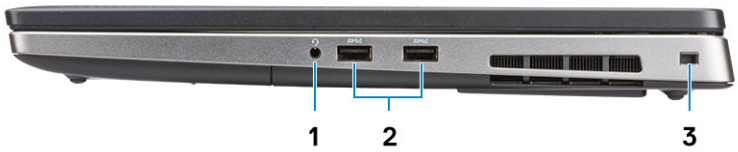
1	Microphone (Optional)	2	Camera-with shutter (Optional)
3	Camera-status light (Optional)	4	Microphone (Optional)
5	Display	6	Battery status light
7	Speakers		

Left view



1	Thunderbolt 3 Type-C port	2	SD Card reader
3	Smartcard reader		

Right view



1 Headset port

2 USB 3.1 Gen 1 ports with PowerShare

3 Security cable slot

Palmrest view

1 Power button

2 Keyboard

3 Fingerprint reader (optional)

4 Contactless Card Reader (optional)

5 Touchpad

Back view

1 HDMI port

2 Mini DisplayPort

3 RJ45 Network port

4 USB 3.1 Gen 1 port with PowerShare

5 Power connector port

Bottom view

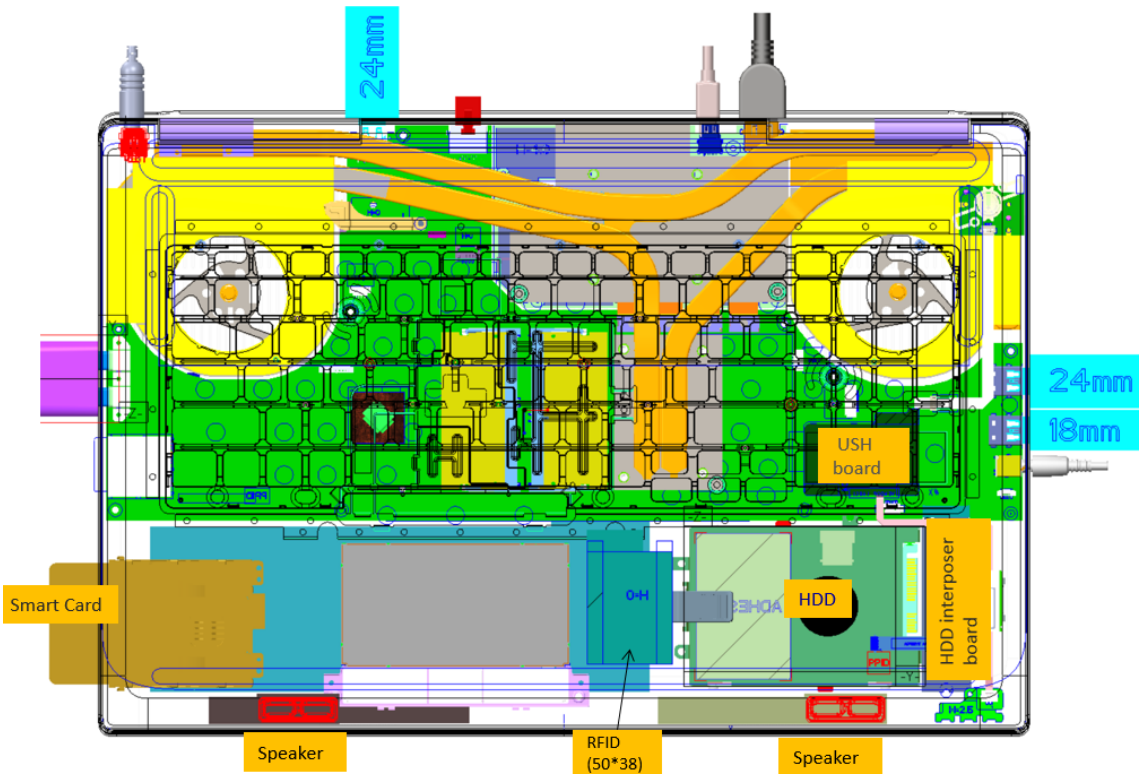
1 Service tag label

2 Battery door release latch

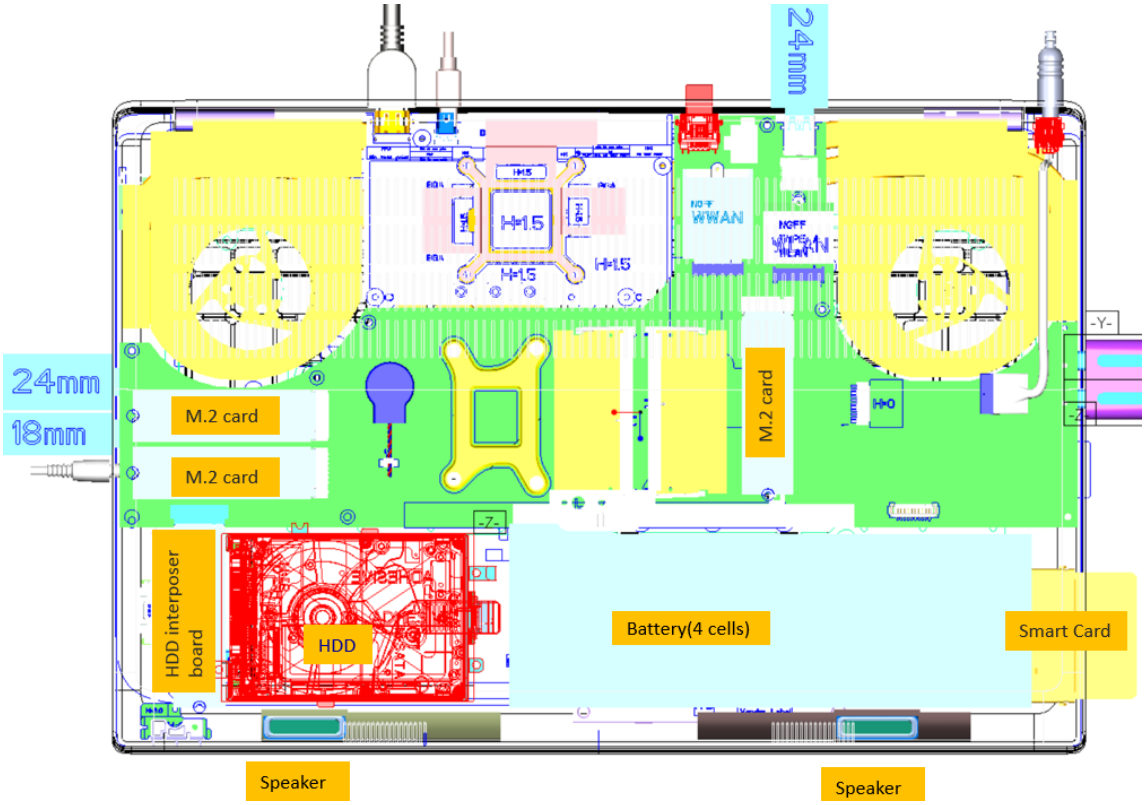
3 Battery door

System layout

Top view



Bottom view


24mm
24mm
18mm
M.2 card
M.2 card
M.2 card
HDD interposer board
HDD
Battery(4 cells)
Smart Card
Speaker
Speaker
H1.5
H1.5
H1.5
WWAN
-Y-
-Z-

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Technical specifications

NOTE: Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For more information about the configuration of your computer, go to Help and Support in your Windows operating system and select the option to view information about your computer.

Topics:

System information

Table 1. System information

Features	Specifications
Chipset	Intel CM246 chipset
DRAM bus width	64-bit per channel (total 128 bit)
FLASH EPROM	48 kHz
PCIe bus	8 Gbps

Features	Specifications
External bus frequency	DMI 3.0-8GT/s

Processor

NOTE: Processor numbers are not a measure of performance. Processor availability is subject to change and may vary by region/country.

Table 2. Processor specifications

Type	UMA Graphics
9th Gen Intel I5-9400H (4 core / 8 TH / 2.5 Ghz up to 4.3 GHz / 8 M cache / 45 W)	Integrated Intel UHD 630
9th Gen Intel I7-9750H (6 core / 12 TH / 2.6 Ghz up to 4.5 GHz / 12 M cache / 45 W)	Integrated Intel UHD 630
9th Gen Intel I7-9850H (6 core / 12 TH / 2.6 Ghz up to 4.6 GHz / 12 M cache / 45 W)	Integrated Intel UHD 630
9th Gen Intel I9-9880H (8 core / 16 TH / 2.3 GHz up to 4.8 GHz / 16 M cache / 45 W)	Integrated Intel UHD 630
9th Gen Intel I9-9980HK (8 core / 16 TH / 2.4 GHz up to 5.0 GHz / 16 M cache / 45 W)	Integrated Intel UHD 630
9th Gen Intel Xeon E-2276M (6 core / 12 TH / 2.8 GHz up to 4.7 GHz / 12 M cache / 45 W)	Integrated Intel UHD P630
9th Gen Intel Xeon E-2286M (8 core / 16 TH / 2.4 Ghz up to 5.0 GHz / 16 M cache / 45 W)	Integrated Intel UHD P630

Memory

Table 3. Memory specifications

Feature	Specifications
Minimum memory configuration	8 GB
Maximum memory configuration	128 GB
Number of slots	4 SODIMM
Maximum memory supported per slot	32 GB
Memory options	• 8 GB - 1 x 8 GB • 16 GB - 1 x 16 GB • 16 GB - 2 x 8 GB • 32 GB - 1 x 32 GB • 32 GB - 2 x 16 GB • 32 GB - 4 x 8 GB • 64 GB - 4 x 16 GB • 64 GB - 2 x 32 GB

Feature	Specifications
	• 128 GB - 4 x 32 GB
Type	DDR4 SDRAM ECC and Non-ECC memory
Speed	• 2666 MHz • 3200 MHz

Table 4. Memory population rules

DIMM Sku	Implementation
X1	B
X2	B+D
X3	A+B+C+D

Location of channel A, B, C, D:

1 B and D under Keyboard– Slot B close to touchpad and Slot D close to LCD

2 A and C under Base– Slot C close to rear Input/Output and Slot A close to the battery

Storage

Table 5. Storage specifications

Type	Form factor	Interface	Security option	Capacity
Four Solid-State Drive (SSD)	M.2 2280	• PCIe 3x4 NVMe, Up to 32 Gbps	SED	• Up to 512 GB • Up to 2 TB
One 2.5" Hard-Disk Drive (HHD) with 4 cell battery only	Approximately (2.760 x 3.959 x 0.374 inches)	SATA AHCI, Up to 6 Gbps	SED FIPS	Up to 2 TB

NOTE: Slot 4: SATA; Slot 3, 5, 6: PCIe. Please note that the slots are marked against there respective slots in the system.

System board connectors

Table 6. System board connectors

M.2 Connectors	• Slot 1 2230 socket 1 key A • Slot 2 3042 socket 2 key B • Slot 3 2280 socket 3 key M • Slot 4 2280 socket 3 key M • Slot 5 2280 socket 3 key M • Slot 6 2280 socket 3 key M
Serial ATA (SATA) connector	1 (with 4 cell battery only)

Media card-reader

Table 7. Media-card reader specifications

Features	Specifications
Type	One SD-card slot
Supported cards	• SD • SDHC • SDXC

Audio

Table 8. Audio specifications

Features	Specifications
Controller	Realtek ALC3281
Type	Four-channel high-definition audio
Speakers	Two (Directional speakers)
Interface	• Universal audio jack • Stereo headphone • Stereo headset • Stereo line in • Microphone in • Stereo line out
Internal speaker amplifier	2W (RMS) per channel

Video

Table 9. Video specifications

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
Intel UHD Graphics 630	UMA	• Intel Core Processor i5 • Intel Core Processor i7 • Intel Core Processor i9	Integrated	Shared system memory	mDP/HDMI/ Type-C	4096×2304
Intel UHD Graphics P630	UMA	Intel Xeon	Integrated	Shared system memory	mDP/HDMI/ Type-C	4096×2304
NVIDIA Quadro RTX3000	Discrete	NA	GDDR6	6 GB	mDP/HDMI/Type-C	Max Digital:

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
						• Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz (mDP/type-c to DP) • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz (mDP/type-c to DP) • HDMI 2.0, 4096x2160 (4K)@60hz
NVIDIA Quadro RTX4000	Discrete	NA	GDDR6	8 GB	mDP/HDMI/Type-C	Max Digital: • Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz (mDP/type-c to DP) • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz (mDP/type-c to DP) • HDMI 2.0, 4096x2160 (4K)@60hz
NVIDIA Quadro RTX5000	Discrete	NA	GDDR6	16 GB	mDP/HDMI/Type-C	Max Digital: • Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz (mDP/type-c to DP) • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz (mDP/type-c to DP) • HDMI 2.0, 4096x2160 (4K)@60hz
Radeon Pro WX 3200	Discrete	NA	GDDR5	4 GB	HDMI/mDP/USB-C	• Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz • HDMI 2.0 - 4096 x 2160 (4K) @ 60 Hz
Radeon Pro WX7130	Discrete	NA	GDDR5	8 GB	HDMI/mDP/ USB-C	• Single DisplayPort 1.4 -

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
						7680 x 4320 (8k) @ 30 Hz • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz • HDMI 2.0 - 4096 x 2160 (4K) @ 60 Hz

Camera

Table 10. Camera specifications

Features	Specifications
Resolution	Camera: • Still image: 0.92 megapixels • Video: 1280x720 at 30 fps Infrared camera (optional on FHD non-touch): • Still image: 0.30 megapixels • Video: 340x340 at 60 fps
Diagonal viewing angle	• Camera - 86.7 degrees • Infrared camera - 70 degrees

Wireless

Table 11. Wireless specifications

Maximum transfer rate	867 Mbps or 2400 Mbps
Frequency bands	2.4 GHz/5 GHz
Encryption	64-bit/128-bit WEP AES-CCMP TKIP

Ports and connectors

Table 12. Ports and connectors

Features	Specifications
Memory card reader	SD 4.0 memory card reader
Smart card reader	Standard

Features	Specifications
USB	Three USB 3.1 Gen 1 ports with PowerShare
Security	Noble wedge lock slot
Docking port	Cable dock support
Audio	• Headset port • Noise reduction array microphones • Microphone (Optional)
Video	• Mini DisplayPort 1.4 • HDMI 2.0
Network adapter	One RJ-45 connector
Thunderbolt	Two thunderbolt 3 Type-C ports

Contactless smart card

Table 13. Contactless smartcard

Title	Description	Dell ControlVault 3 Contactless Smartcard reader with NFC
Felica Card Support	Reader and software capable of supporting Felica contactless cards	Yes
Prox (Proximity) (125kHz) Card support	Reader and software capable of supporting Prox/Proximity/125kHz contactless cards	No
ISO 14443 Type A Card Support	Reader and software capable of supporting ISO 14443 Type A contactless cards	Yes
ISO 14443 Type B Card Support	Reader and software capable of supporting ISO 14443 Type B contactless cards	Yes
ISO/IEC 21481	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO/IEC 18092	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO 15693 Card Support	Reader and software capable of supporting ISO15693 contactless cards	Yes
NFC Tag Support	Supports reading and processing of NFC compliant tag information	Yes
NFC Reader Mode	Support for NFC Forum Defined Reader mode	Yes
NFC Writer Mode	Support for NFC Forum Defined Writer mode	Yes
NFC Peer-to-Peer Mode	Support for NFC Forum Defined Peer to Peer mode	Yes

Title	Description	Dell ControlVault 3 Contactless Smartcard reader with NFC
EMVCo Compliant	Compliant with EMVCO smartcard standards as posted to www.emvco.com	Yes
EMVCo Certified	Formally certified based on EMVCO smartcard standards	Yes
NFC Proximity OS Interface	Enumerates NFP (Near Field Proximity) device for OS to utilize	Yes
PC/SC OS interface	Personal Computer/Smart Card specification for integration of hardware readers into personal computer environments	Yes
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for OS level drivers	Yes
Windows Certified	Device certified by Microsoft WHCK	Yes
Dell ControlVault support	Device connects to Dell ControlVault for usage and processing	Yes

NOTE: 125 Khz proximity cards are not supported.

Table 14. Supported cards

Manufacturer	Card	Supported
HID	jCOP readertest3 A card (14443a)	Yes
	1430 1L	
	DESFire D8H	
	iClass (Legacy)	
	iClass SEOS	
NXP/Mifare	Mifare DESFire 8K White PVC Cards	Yes
	Mifare Classic 1K White PVC Cards	
	NXP Mifare Classic S50 ISO Card	
G&D	idOnDemand - SCE3.2 144K	Yes
	SCE6.0 FIPS 80K Dual+ 1 K Mifare	
	SCE6.0 nonFIPS 80K Dual+ 1 K Mifare	
	SCE6.0 FIPS 144K Dual + 1K Mifare	
	SCE6.0 nonFIPS 144K Dual + 1 K Mifare	
	SCE7.0 FIPS 144K	
Oberthur	idOnDemand - OCS5.2 80K	Yes
	ID-One Cosmo 64 RSA D V5.4 T=0 card	

Display

Table 15. Display specifications

Features	Specifications
Type	• 17.3 in. HD+ TN 1600x900 AG non-touch, No Mic, 60% color gamut • 17.3 in. HD+ TN 1600x900 AG non-touch, Mic, 60% color gamut • 17.3 in. HD+ TN 1600x900 AG non-touch, Cam/Mic, 60% color gamut • 17.3 in. UltraSharp FHD WVA 1920x1080 AG, NT, No Mic, w/ Prem Panel Guar 72% color gamut • 17.3 in. UltraSharp FHD WVA 1920x1080 AG, NT, Mic, w/Prem Panel Guar 72% color gamut • 17.3 in. UltraSharp FHD WVA 1920x1080 AG, NT, Cam/Mic, w/ Prem Panel Guar 72% color gamut • 17.3 in. UltraSharp FHD WVA 1920x1080 AG, NT, No WWAN, IR Cam/Mic, w/Prem Panel Guar 72% color gamut • 17.3 in. UltraSharp UHD WVA 3840x2160 AG NT, No WWAN, Cam/Mic, w/Prem Panel Guar 100% Adobe color gamut
Luminance/Brightness (typical)	• 220 nits (HD+ 60% color gamut) • 300 nits (FHD 72% color gamut) • 400 nits (UHD Adobe 100% color gamut)
Height (Active area)	• HD+ - 214.92 mm (8.46 in.) • FHD - 214.81 mm (8.46 in.) • UHD - 214.94 mm (8.46 in.)
Width (Active area)	• HD+ - 382.08 mm (15.04 in.) • FHD - 381.89 mm (15.04 in.) • UHD - 382.12 mm (15.04 in.)
Diagonal	• HD+ - 438.38 mm (17.30 in.) • FHD - 438.16 mm (17.30 in.) • UHD - 438.42 mm (17.30 in.)
Megapixels	• HD+ - 1.44 • FHD - 2.07 • UHD - 8.29
Pixels Per Inch (PPI)	• HD+ - 106 • FHD - 127 • UHD - 255
Contrast ratio	• HD+ - 500:1 • FHD - 700:1 • UHD - 1000:1
Refresh rate	60 Hz

Features	Specifications
Horizontal viewing angle (min)	• HD+ - 40/40 degrees • FHD - 80/80 degrees • UHD - 80/80 degrees
Vertical viewing angle (min)	• HD+ - 10/30 degrees • FHD - 80/80 degrees • UHD - 80/80 degrees
Pixel pitch	• HD+ - 0.2388 mm • FHD - 0.1989 mm • UHD - 0.0995 mm
Power consumption (max)	• 4.4 W (HD+ 60% color gamut) • 8 W (FHD 72% color gamut) • 14 W (UHD Adobe 100% color gamut)

Keyboard

Table 16. Keyboard specifications

Features	Specifications
Number of keys	• 103 (U.S. and Canada) • 104 (Europe) • 106 (Brazil) • 107 (Japan)
Size	Full sized • X= 19.00 mm key pitch • Y= 19.00 mm key pitch
Backlit keyboard	Optional
Layout	QWERTY/AZERTY/Kanji

Touchpad

Table 17. Touchpad specifications

Features	Specifications
Resolution	• Horizontal: 1048 • Vertical: 984
Dimensions	• Width: 3.92 inches (99.50 mm) • Height: 2.09 inches (53 mm)
Multi-touch	Configurable single finger and multi-finger gestures

Operating system

Table 18. Operating system

Operating systems supported	• Windows 10 Home (64 bit) • Windows 10 Professional (64 bit) • Windows 10 Pro for Workstations (64 bit) • Ubuntu 18.04 LTS (64bit) • Red Hat Linux Enterprise 8.0

Battery

Table 19. Battery

Features	Specifications
Type	• 64 WHr Lithium ion Polymer 4 cell battery with ExpressCharge • 97 WHr Lithium ion Polymer 6 cell battery with ExpressCharge • 97 WHr Lithium ion Polymer 6 cell battery with three year warranty
Dimension	1 64 WHr "smart" lithium-ion • Length - 222.40 mm (8.76 in) • Width - 73.80 mm (2.90 in) • Height - 11.15 mm (0.44 in) • Weight - 298.00 g 2 97 WHr "smart" lithium-ion • Length - 332.00 mm (13.07 in) • Width - 73.80 mm (2.90 in) • Height - 11.15 mm (0.439 in) • Weight - 445.00 g
Weight (maximum)	• 64 WHr - 2.98 kg (0.66 lb) • 97 WHr - 4.45 kg (0.98 lb)
Voltage	• 64 WHr - 7.8 VDC • 97 WHr - 11.4 VDC
Life span	300 discharge/recharge cycles
Charging time when the computer is off (approximate)	4 hours
Operating time	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions
Temperature range: Operating	0°C to 35°C (32°F to 95°F)
Temperature range: Storage	-40°C to 65°C (-40°F to 149°F)
Coin-cell battery	ML1220

Power adapter

Table 20. Power adapter specifications

Type	240 W adapter
Input Voltage	100 to 240 VAC
Input current (maximum)	240 W - 3.5 A
Input frequency	50 Hz to 60 Hz
Output current	240 W - 12.31 A (continuous)
Rated output voltage	19.5 VDC
Temperature range (Operating)	0º to 40º C (32º to 104º F)
Temperature range (Non-Operating)	-40º to 70º C (-40º to 158º F)

Dimensions and weight

Table 21. Dimensions and weight

Height	Front height - 1.03 inches (26.15 mm) Rear height - 1.19 inches (30.3 mm) Front height (Al Cover)- 0.99 inches (25.30 mm) Rear height (Al Cover)- 1.20 inches (30.55 mm)
Width	16.31 inches (414.20 mm)
Depth	10.78 inches (273.7 mm)
Weight	Starting 6.81 lbs (3.09 kg)

Computer environment

Airborne contaminant level: G1 as defined by ISA-S71.04-1985

Table 22. Computer environment

	Operating	Storage
Temperature range	0°C to 35°C (32°F to 95°F)	-40°C to 65°C (-40°F to 149°F)
Relative humidity (maximum)	20% to 80% (non-condensing) **NOTE: Maximum dew point temperature = 26°C**	20% to 95% (non-condensing) **NOTE: Maximum dew point temperature = 33°C**
Vibration (maximum)	0.26 GRMS	1.37 GRMS

	Operating	Storage
Shock (maximum)	105 G †	40 G‡
Altitude (maximum)	-15.2 m to 3048 m (-50 ft to 10,000 ft)	-15.2 m to 10,668 m (-50 ft to 35,000 ft)

* Measured using a random vibration spectrum that simulates user environment.

† Measured using a 2 ms half-sine pulse when the hard drive is in use.

‡ Measured using a 2 ms half-sine pulse when the hard-drive head is in parked position.

Security

Table 23. Security

Trusted Platform Module (TPM) 2.0	Integrated on system board
Smartcard	Yes

Security software

Table 24. Security software

Dell Data Protection | Security Tools (DDP | ST)	Standard
Dell Data Protection | Encryption (DDPE)	Optional

Miscellaneous software

Table 25. Miscellaneous software

Dell Precision Optimizer v6.0	Standard
Teradici PCoIP Workstation Access Software	Optional

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Engineering specifications

Smart card support

Table 26. Smart card support

Type	ISO14443A	14443B	ISO15693	Functionality	Remarks
SeOS	Yes	No	No	CCID	
PIV-II • NIST PIV1 • NIST PIV1	Yes	No	No	CCID	
DesFire	Yes	No	No	NFC or CCID*	* The routing is configurable or dynamic based on presence of NDEF information (this applies to all 14443A/B cards supporting ISO-DEP protocol)
SmartMX	Yes	Yes	No	Any	The use of SmartMX on a card is transparent to the USH solution and does not dictate how the card will be used.
JCOP(Java card)	Yes	Yes	No	Any	The use of SmartMX on a card is transparent to the USH solution and does not dictate how the card will be used.
Passport cards/National cards				Depends on the card implementation	The type of card used varies. Though typically 14443A or B cards are used.
EMVCo cards (PayPass, PayWave, ExpressPay)	Yes	Yes	No	Payment, CCID	These cards are not really applicable to the Dell USH solution (though they will be routed to the CCID stack)
Mifare Plus (SL1)	Yes	No	No	CCID	
Mifare Ultralight	Yes	No	No	CCID	

Type	ISO14443A	14443B	ISO15693	Functionality	Remarks
Felica	No	No	No	NFC or CCID*	*The routing is configurable.

Functionality

- A – HID Secure application can be used for pre-boot authentication, HID secure application area Read and Read/Write of all other application (post boo), Anti-collision to support multiple card in the field.
- B – CHUID (can be used for pre-boot authentication), ISO/IEC 1443 Part 4 communication via PC/SC 2.01 (post boot) Anti-collision to support multiple card in the field.
- C – UID Read (for pre boot authentication), ISO/IEC 1443 Part 4 communication via PC/SC 2.01 (post boot) Anti-collision to support multiple card in the field.
- D – UIS Read (for pre boot authentication and post boot authentication) Anti-collision to support multiple card in the field.
- E – configurable for UID Read (for pre boot authentication and post boot authentication) Anti-collision to support multiple card in the field.

Graphics options

Intel HD graphics

Table 27. Intel HD graphics 630

Bus type	Internal PCIe
Memory interface	N/A (UMA)
Display support	Up to three displays
Maximum color depth	Up to 10bit/colour
Maximum vertical refresh rate	Up to 60 Hz at 3840x2160

NVIDIA Quadro RTX3000

Table 28. NVIDIA Quadro RTX3000 specifications

Graphics memory	6 GB GDDR6
Bus type	PCIe x16 Gen3
Memory Interface	192 bit
Clock Speeds	VRAM Clock: 7001 Mhz
GPU base clock	Base: 945 Mhz Boost: 1380 Mhz
Estimated Maximum Power	80 W
Display Support	mDP/HDMI/Type-C

Maximum Color Depth	Up to 10bit/color
Maximum Vertical Refresh Rate	Up to 395Hz at 1920x1080 Up to 118Hz at 3840x2160
Operating Systems Graphics/ Video API Support	DirectX 12.1, OpenGL 4.6
Supported Resolutions and Max Refresh Rates (Hz)	• Max Digital : Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz (mDP/type-c to DP) • Max Digital : Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz (mDP/type-c to DP)
Numbers of Display Support	Up to four displays

NVIDIA Quadro RTX4000

Table 29. NVIDIA Quadro RTX4000 specifications

Graphics memory	8GB GDDR6
Bus type	PCIe x16 Gen3
Memory Interface	256 bit
Clock Speeds	VRAM Clock: 7001Mhz
GPU base clock	Base: 1110Mhz / Boost: 1560 Mhz
Estimated Maximum Power	110 W
Display Support	mDP/HDMI/Type-C
Maximum Color Depth	Up to 10bit/color
Maximum Vertical Refresh Rate	Up to 395Hz at 1920x1080 Up to 118Hz at 3840x2160
Operating Systems Graphics/ Video API Support	DirectX 12.1, OpenGL 4.6
Supported Resolutions and Max Refresh Rates (Hz)	• Max Digital : Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz (mDP/type-c to DP) • Max Digital : Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz (mDP/type-c to DP)
Numbers of Display Support	Up to four displays

NVIDIA Quadro RTX5000

Table 30. NVIDIA Quadro RXT5000 specifications

Graphics memory	16GB GDDR6
Bus type	PCIe x16 Gen3
Memory Interface	256 bit
Clock Speeds	VRAM Clock: 7001Mhz
GPU base clock	Base : 1035 Mhz / Boost : 1530 Mhz
Estimated Maximum Power	110 W
Display Support	mDP/HDMI/Type-C
Maximum Color Depth	Up to 10bit/color
Maximum Vertical Refresh Rate	Up to 395Hz at 1920x1080 Up to 118Hz at 3840x2160
Operating Systems Graphics/ Video API Support	DirectX 12.1, OpenGL 4.6
Supported Resolutions and Max Refresh Rates (Hz)	• Max Digital : Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz (mDP/type-c to DP) • Max Digital : Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz (mDP/type-c to DP)
Numbers of Display Support	Up to four displays

RadeonPro WX3200

Table 31. AMD RadeonPro WX3200

Graphics memory	4 GB GDDR5
Bus type	PCIe x16 Gen3
Memory Interface	128-bit
Clock Speeds	1295 MHz graphics core, 1500 MHz memory
Estimated Maximum Power	50W TGP (GPU + frame buffer)
Display Support	HDMI/mDP/USB-C
Maximum Color Depth	Maximum 4:4:4 Color Depth:12 (bits per pixel)
Maximum Vertical Refresh Rate	Up to 85Hz depending on resolution

Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL 4.5
Supported Resolutions and Max Refresh Rates (Hz)	• Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz • HDMI 2.0 - 4096 x2160 (4K) @ 60 Hz
Numbers of Display Support	Up to four displays

RadeonPro WX7130

Table 32. AMD RadeonPro WX7130

Graphics memory	8 GB GDDR5
Bus type	PCIe x16 Gen3
Memory Interface	256-bit
Clock Speeds	1243 MHz graphics core, 1750 MHzmemory
Estimated Maximum Power	120W TGP (GPU + frame buffer)
Display Support	HDMI/mDP/USB-C
Maximum Color Depth	Maximum 4:4:4 Color Depth:12 (bitsper pixel)
Maximum Vertical Refresh Rate	Up to 85Hz depending on resolution
Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL 4.5
Supported Resolutions and Max Refresh Rates (Hz)	• Single DisplayPort 1.4 - 7680 x 4320 (8k) @ 30 Hz • Dual DisplayPort 1.4 - 7680 x 4320 (8k) @ 60 Hz • HDMI 2.0 - 4096 x 2160 (4K) @ 60 Hz
Numbers of Display Support	Up to four displays

Video card compatibility matrix

Video card	Battery allowed	Maximum storage allowed
Intel UMA GFX	4 cell and 6 cell	4xM.2 or 3xM.2 + 1x2.5"
Radeon Pro WX3200 w/4 GB GDDR5	4 cell and 6 cell	4xM.2 or 3xM.2 + 1x2.5"
Radeon Pro WX7130 w/8 GB GDDR5	6 cell only	4xM.2
Nvidia Quadro RTX3000 w/6 GB GDDR6	6 cell only	4xM.2
Nvidia Quadro RTX4000 w/8 GB GDDR6	6 cell only	4xM.2
Nvidia Quadro RTX5000 w/16 GB GDDR6	6 cell only	4xM.2

Hard drives

Table 33. Supported hard drives

2.5" 7mm 500 GB 7200RPM SATA Hard Drive
2.5" 7mm 500 GB 7200RPM SATA FIPS Hard Drive
2.5" 7mm 1 TB 7200RPM SATA Hard Drive
2.5" 7mm 2 TB 5400RPM SATA Hard Drive
256 GB M.2 NVMe PCIe SSD Class 40
512 GB M.2 NVMe PCIe SSD Class 40
1 TB M.2 NVMe PCIe SSD Class 40
2 TB M.2 NVMe PCIe SSD Class 40
512 GB M.2 NVMe PCIe SED SSD Class 40
1 TB M.2 NVMe PCIe SED SSD Class 40
512 GB M.2 NVMe PCIe SSD Class 50
1 TB M.2 NVMe PCIe SSD Class 50

500 GB 2.5-inch 7200 RPM SATA Hard Drive

Table 34. 500 GB 2.5-inch 7200 RPM SATA Hard Drive

Capacity (GB)	500 GB
Dimensions (W x D x H)	Approximately (2.76 in. x 3.96 in. x 0.28 in.)
Interface type and maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical blocks	976,773,168
Power source	
Power consumption (reference only)	Idle 0.7 W, Active 3.10 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	5°C to 60°C
Relative humidity range	5% to 90%
Op shock (@ 2ms)	350 G

Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 90%

500 GB 2.5-inch 7200 RPM SATA FIPS Hard Drive

Table 35. 500 GB 2.5-inch 7200 RPM SATA FIPS Hard Drive

Capacity (GB)	500 GB HDD 7200 RPM OPAL SED FIPS
Dimensions (W x D x H)	Approximately (2.75 in. x 3.94 in. x 0.28 in.)
Interface type and maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical blocks	976,773,168
Power source	
Power consumption (reference only)	Idle 0.7 W, Active 3.60 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	5°C to 60°C
Relative humidity range	5% to 90%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 90%

2.5-inch 1 TB 7200 RPM SATA Hard Drive

Table 36. 2.5-inch 1 TB 7200 RPM SATA Hard Drive

Capacity (GB)	1 TB HDD 7200 RPM
Dimensions (W x D x H)	Approximately (2.76 in. x 3.96 in. x 0.38 in.)
Interface type and maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical blocks	1,953,525,168
Power source	

Power consumption (reference only)	Idle 0.7 W, Active 3.10 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	5°C to 60°C
Relative humidity range	5% to 90%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 90%

2.5-inch 2 TB 5400 RPM SATA Hard Drive

Table 37. 2.5-inch 2 TB 5400 RPM SATA Hard Drive

Capacity (GB)	2 TB HDD 5400 RPM
Dimensions (W x D x H)	Approximately (2.75 in. x 3.937 in. x 0.276 in.)
Interface type and maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical blocks	3,907,029,168
Power source	
Power consumption (reference only)	Idle 0.7 W, Active 3.60 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	5°C to 60°C
Relative humidity range	5% to 90%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 90%

256 GB M.2 NVMe PCIe SSD Class 40

Table 38. 256 GB M.2 NVMe PCIe SSD Class 40

Capacity (GB)	256 GB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	800K hours
Logical blocks	500,118,192
Power source	
Power consumption (reference only)	Idle 1.7 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	10% to 90%
Op shock (@ 2ms)	1000 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

512GB M.2 NVMe PCIe SSD Class 40

Table 39. 512GB M.2 NVMe PCIe SSD Class 40

Capacity (GB)	512 GB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (Up to 4 lanes)
MTBF	800K hours
Logical blocks	1,000,215,216
Power source	
Power consumption (reference only)	Idle 1.7 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C

Relative humidity range	10% to 90%
Op shock (@ 2ms)	1000 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

1 TB M.2 NVMe PCIe SSD Class 40

Table 40. 1 TB M.2 NVMe PCIe SSD Class 40

Capacity (GB)	1 TB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (Up to 4 lanes)
MTBF	800K hours
Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 1.7 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	10% to 90%
Op shock (@ 2ms)	1000 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

2 TB M.2 NVMe PCIe SSD Class 40

Table 41. 2 TB M.2 NVMe PCIe SSD Class 40

Capacity (GB)	2 TB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	800K hours

Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 1.7 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	10% to 90%
Op shock (@ 2ms)	1000G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

512 GB M.2 NVMe PCIe SED SSD Class 40

Table 42. 512 GB M.2 NVMe PCIe SED SSD Class 40

Capacity (GB)	512 GB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8Gb/s (up to 4 lanes)
MTBF	1.5 Million hours
Logical blocks	1,000,215,216
Power source	
Power consumption (reference only)	Idle 600 mW, Active 5 mW
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	5% to 95%
Op shock (@ 2ms)	1500G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 85°C
Relative humidity range	5% to 95%

1 TB M.2 NVMe PCIe SED SSD Class 40

Table 43. 1 TB M.2 NVMe PCIe SED SSD Class 40

Capacity (GB)	1 TB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (Up to 4 lanes)
MTBF	1.5 Million Hours
Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 600 mW, Active 5 mW
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	5% to 95%
Op shock (@ 2ms)	1500 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 85°C
Relative humidity range	5% to 95%

512 GB M.2 NVMe PCIe SSD Class 50

Table 44. 512 GB M.2 NVMe PCIe SSD Class 50

Capacity (GB)	512 GB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	1.5 Million hours
Logical blocks	1,000,215,216
Power source	
Power consumption (reference only)	Idle 600 mW, Active 5 mW
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C

Relative humidity range	5% to 95%
Op shock (@ 2ms)	1500 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 85°C
Relative humidity range	5% to 95%

1 TB M.2 NVMe PCIe SSD Class 50

Table 45. 1 TB M.2 NVMe PCIe SED SSD Class 50

Capacity (GB)	1 TB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (Up to 4 lanes)
MTBF	1.5 million hours
Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 600 mW, Active 5 mW
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	5% to 95%
Op shock (@ 2ms)	1500 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 85°C
Relative humidity range	5% to 95%

Communications

Wireless LAN options

Table 46. Wireless LAN

Intel® Wi-Fi 6 AX200 160MHz (Cyclone Peak 2) 2x2 Wi-Fi + BT 5 M.2 Wireless Card
Qualcomm QCA61x4A 802.11ac MU-MIMO Dual Band (2x2) Wi-Fi + Bluetooth 4.2 LE M.2 Wireless Card

Optional Mobile Broadband and GPS

Table 47. Mobile Broadband and GPS

Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5816e for APJ)
Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5811e for EMEA/APJ/ROW)
Dell Wireless Qualcomm Snapdragon X7 HSPA+ (DW5811e for China/Indonesia)
Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5811e for DAO)

Intel Wi-Fi 6 AX200 2x2 .11ax 160MHz + Bluetooth 5.0Wireless Card

Table 48. IIntel Wi-Fi 6 AX200 2x2 .11ax 160MHz + Bluetooth 5.0Wireless Card

Attribute	Specification
Host interface	M.2 2230 form factor (PCIe for Wi-Fi, USB for Bluetooth)
Network standard	IEEE 802.11a/b/g/n/ac/ax, 160MHz channel use
Wi-Fi Alliance Certifications	Wi-Fi CERTIFIED a/b/g/n/ac with wave 2 features, designed to be Wi-Fi CERTIFIED ax (Wi-Fi 6), WMM, WMM-PS, WPA, WPA2, WPS2, Protected Management Frames, and Wi-Fi Direct (For Microsoft Windows only)
Operating Frequency Bands	2.4 GHz and 5 GHz
Data Rate	2.4GHz 40M: Up to 574 Mbps 5GHz 80M: Up to 1.2 Gbps 5GHz 160M: Up to 2.4 Gbps
Power consumption	Optimized power modes (sleep states) reduce power consumption during periods of inactivity
Authentication	WPA and WPA2, 802.1X (EAP-TLS, TTLS, PEAP,EAP-SIM, EAP-AKA, EAP-AKA')
Authentication Protocols	PAP, CHAP, TLS, GTC, MS-CHAP*, MS-CHAPv2
Encryption	64-bit and 128-bit WEP, TKIP, 128-bit AES-CCMP
Product Safety	UL, C-UL, CB (IEC60950-1)
Power range	• 2.4 GHz : 13 dBm – 18 dBm • 5 GHz : 9.5 dBm – 16 dBm **NOTE: Optimized power modes (sleep states) reduce power consumption during periods of inactivity**
Management Capabilities Alerting	Support for Intel AMT
Government Compliance	FIPS, FISMA
Client Utility	Intel PRO/Set Wireless Software v20 and later.

Attribute	Specification
Antenna Diversity	Supported
Radio On/Off	Supported
Roaming	Supports seamless roaming between access points
Wake On Wireless	Supported
Wireless Display	Native Miracast support by Windows 10
Wireless PAN Standard	Dual Mode Bluetooth 5, BLE (HW ready, SW depends on OS)
Bluetooth Data rates	Up to 3Mbps
Bluetooth Operating Frequency Bands	2.4 GHz
Bluetooth Profiles Supported	Support for Microsoft Inbox Bluetooth profiles in Windows 10
Bluetooth Data Encryption	128-bit encryption
Bluetooth Output Power	Power class 1
Temperature	Operating temperature 0° to + 50° C (Full performance at shield temperatures up to 80° C) Storage temperature of -40° to +70° C
Humidity	Up to 90% RH non-condensing (at temperatures of 25° C to 35° C)
Antennae	2x2
Transmit Peak Power	• Bluetooth: 21 dBm • WiFi: 21 dBm

Qualcomm QCA61x4A 802.11ac MU-MIMO Dual Band (2x2) Wi-Fi + Bluetooth 4.2 LE M.2 Wireless Card

Table 49. Qualcomm QCA61x4A 802.11ac

Host interface	M.2 2230 form factor (WiFi - PCIe , Bluetooth - USB)
Network standard	802.11a, 802.11b, 802.11g, 802.11n and 802.11ac
11ac Wave2 feature	MU-MIMO RX
Wi-Fi Alliance certifications	802.11a, 802.11b, 802.11g, WPA, WPA2 , WMM, 11ac, Wifi -Direct, WMM-Power Save, Wifi Protected Setup, Voice-Personal
Operating frequency bands	2.4 GHz (802.11b/g/n) and 5 GHz (802.11a/n/ac)
Dual diversity antenna switching (For systems designed with main and auxiliary antennas)	2x2 MIMO operation when in 802.11n mode with 2x2 or greater access point
Data rates	• 802.11ac - Up to 867 Mbps • ; 802.11n - Up to 450 Mbps • 802.11a/g - Up to 54 Mbps • 802.11b - Up to 11 Mbps

Security Authentication	Open, Shared, WPA, WPA-PSK, WPA2, WPA2-PSK
EAP methods	EAP-TLS, EAP-TTLS (MSCHAPv2), PEAPv0(EAP-MS-CHAPv2)
Client utility	Native Wi-Fi and Bluetooth Microsoft UI support
Software support	Microsoft WHQL certified for Windows 7/8.1 and Windows 10; Linux
Radio On/Off	Hardware and software on/off disables transmit and receive to comply with aviation in-flight restrictions
LED output	Wireless enable
Roaming	Seamless roaming between 802.11a, 802.11b, 802.11b/g, 802.11n and 802.11ac access points
Wake On wireless	Supported when using Magic Packet over the Air
Miracast (WiFi Display)	Supports Miracast (WiFi Display) on Win8.1/10
Country restrictions	All (except Tunisia)
Wireless PAN Standard	Dual-mode Bluetooth 4.2, BLE (HW ready, SW depends on OS)
Bluetooth data rates	Up to 3Mbps
Bluetooth operating frequency bands	2.4 GHz
Transmission	FHSS (Frequency Hopping Spread Spectrum)
Bluetooth data encryption	128-bit encryption
Bluetooth receive sensitivity	• -70dBm@BER≤0.01% (EDR) • -100dBm@BER≤30.8% (LE nominal)
Temperature	• Operating temperature 0° to + 65° C • Storage temperature of -40° to +85° C
Humidity	Up to 90%

Dell Wireless Qualcomm Snapdragon X7 LTE-A (DW5816E for APJ)

Table 50. Dell Wireless Qualcomm Snapdragon X7 LTE-A

	Docomo	KDDI	Softbank	Telstra	Generic
Network	LTE CAT 6	LTE CAT 6	LTE CAT 6	LTE CAT 6	LTE CAT 6
Speed (Downlink)	< 300 Mbps	< 300 Mbps	< 300 Mbps	< 300 Mbps	< 300 Mbps
Speed (Uplink)	< 50 Mbps	< 50 Mbps	< 50 Mbps	< 50 Mbps	< 50 Mbps

	Docomo	KDDI	Softbank	Telstra	Generic
Fallback network	HSPA+	NA	HSPA+	HSPA+	HSPA+
Fallback speed (Downlink)	HSPA+ 42 Mbps	NA	HSPA+ 42 Mbps	HSPA+ 42 Mbps	HSPA+ 42 Mbps
Frequency bands	• LTE Band 1,3,19,21,28 • UMTS Band 1, 9, 19	LTE Band 1,18,28,41	• LTE Band 1,8,41 • UMTS Band 1, 8	• LTE Band 1,3,7,8,28 • UMTS Band 1, 5	• LTE Band 1,3,5,7,8, 18,19,21,28,38,39, 40,41 • UMTS Band 1,5,6,8,9,19 • TD-SCDMA Band 39
LTE/WWAN antenna	Main (Tx /Rx) + Aux (Rx/GNSS)	Main (Tx /Rx) + Aux (Rx/GNSS)	Main (Tx /Rx) + Aux (Rx/GNSS)	Main (Tx /Rx) + Aux (Rx/GNSS)	Main (Tx /Rx) + Aux (Rx/GNSS)
Operating system support	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Windows 10, 32/64 bits	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Windows 10, 32/64 bits	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Windows 10, 32/64 bits	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Windows 10, 32/64 bits	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Windows 10, 32/64 bits
Host interface	USB 2.0 and USB 3.0	USB 2.0 and USB 3.0	USB 2.0 and USB 3.0	USB 2.0 and USB 3.0	USB 2.0 and USB 3.0

Table 51. Specifications

Host interface	USB 3.0 and USB 2.0
Telecommunications standard	Compliance with LTE 3GPP Release 11, UMTS 3GPP Release 9
Industry certification	GCF, CE, NCC, JRF/JPA
Carrier approval	Docomo , KDDI, Softbank, Telstra, Generic FW (GCF certified)
Supported Frequency Bands	• LTE Band 1, 3, 5, 7, 8, 18,19, 21, 28, 38, 39, 40, 41 • UMTS Band 1, 5, 6, 8, 9, 19 • TD-SCDMA Band 39
LTE/WWAN Antenna	• Main antenna is for WWAN/LTE Transmittal and Receiving (Tx /Rx) function • Aux antenna is for WWAN/LTE Receiving and GNSS Receiving function
Data rate	• LTE Speed Cat 6 (Downlink) up to 300 Mbps (FDD) • LTE Speed Cat 6 (Uplink) up to 50 Mbps (FDD)
Conductive sensitivity	• LTE band2 : -98.8dBm (typical) • LTE band4 : -99.4dBm (typical) • LTE band5 : -97.6dBm (typical) • LTE band13 : -94.0dBm (typical) • LTE band17 : -96.6dBm (typical)

	• LTE band25 : -98.7dBm (typical)
Power consumption	• LTE : 900mA at 20dBm Tx power • UMTS : 400mA at 20dBm Tx power • TD-SCDMA : 150mA at 23dBm Tx power **NOTE: Peak current of 2A for all RF bands.**
Software support	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Microsoft WHQL certified for Windows 10, 32/64 bits
Client utility	• Windows 7, 32/64 bits • Windows 8.1, 32/64 bits • Microsoft WHQL certified for Windows 10, 32/64 bits
Radio On/Off	Supported Hardware and software on/off disables transmit and receive to comply with aviation in-flight restrictions
LED output	Supported Wireless LED on when WWAN/LTE radio enabled
SIM card format	Format: Micro-SIM (3FF), Support voltage type: 1.8V and 3V
Roaming	Roaming to supported bands comply with 3GPP standards
GNSS	Supported both autonomous GNSS (GPS, GLONASS, BeiDou , Galileo) and assisted GNSS (A-GNSS) on frequency band L1
Humidity	Up to 85% relative humidity for 48 hours, non-condensing
Temperature	• Operational : -30°C to +70°C Class A - 3GPP compliant • Non-operational : -40°C to +85°C for 96 hours (from MIL-STD 202 method 108)
Wake On Wireless	Supported WWAN/LTE module wake on wireless feature when system platform implements control pins for waking the host side

Mobile Broadband - LTE-A WWAN

- Qualcomm Snapdragon X20 Global Gigabit LTE (Gobi 4G/LTE)

Table 52. Qualcomm Snapdragon X20 Global Gigabit LTE for AT&T, Verizon and Sprint, US (DAO), South Korea, Taiwan, Indonesia and (EMEA/APJ/ROW)

Carrier	Verizon	AT&T	Sprint	GCF Generic
Network	LTE CAT16	LTE CAT16	LTE CAT16	LTE CAT16
Speed (Downlink)	< 1 Gbps	< 1 Gbps	< 1 Gbps	< 1 Gbps
Speed (Uplink)	< 150 Mbps	< 150 Mbps	< 150 Mbps	< 150 Mbps
Fallback Network	NA	HSPA+	NA	HSPA+

Carrier	Verizon	AT&T	Sprint	GCF Generic
Fallback Speed (Downlink)	NA	HSPA+ 42 Mbps	NA	HSPA+ 42 Mbps
Frequency Bands	LTE: 2/ 4/ 5/ 13	LTE: 2/ 4/ 5/ 12/ 14/ 29/ 30/ 66 WCDMA: 2/5	LTE: 25/ 26/ 30/ 41	LTE: 1/2/3/4/5/7/8/12/13/14 / 17/18/19/20/25/26/28/29/30/32/38/39/40/41/42/43/46/66 WCDMA: 1/2/4/5/6/8/9/19
SIM	Yes	Yes	Yes	Yes
LTE/WWAN Antenna	Main (Tx/Rx) + Aux (Rx/ GNSS)+ MIMO	Main (Tx/Rx) + Aux (Rx/ GNSS) + MIMO	Main (Tx/Rx) + Aux (Rx/ GNSS)+ MIMO	Main (Tx/Rx) + Aux (Rx/ GNSS) + MIMO
Operating System Support	Windows 7, 32/64 bits Windows 10, 64 bits	Windows 7, 32/64 bits Windows 10, 64 bits	Windows 7, 32/64 bits Windows 10, 64 bits	Windows 7, 32/64 bits Windows 10, 64 bits
Host Interface	Supported both USB 3.0/2.0	Supported both USB 3.0/2.0	Supported both USB 3.0/2.0	Supported both USB 3.0/2.0
Transmit power range	22 dBm to 24.5 dBm	22 dBm to 24.5 dBm	22 dBm to 24.5 dBm	22 dBm to 24.5 dBm

Docks and port replicators

Table 53. Supported docks and port replicators

Precision Thunderbolt Dock - TB18DC

Sonnet eGFX Breakaway Box 550

Dell Thunderbolt Dock - TB16

Security devices

Table 54. Supported security devices

Kensington N17 Keyed Laptop Lock for Dell Devices

Noble Wedge lock

Noble NG Dual Head Lock -System Security Kit

Hot key definition

Table 55. Keyboard shortcuts

Hot keys	Function
Fn+ESC - Fn Lock	Allows the user to toggle between **locked** and **unlocked** Fn keys.
Fn+F1 - Audio Volume Mute	Temporarily mutes/unmutes the audio. The audio level before muting is returned after unmuting.
Fn+F2 – Audio Volume Down/Decrease	Decreases the audio volume until minimum/off is reached.
Fn+F3 – Audio Volume Up/Increase	Increases the audio volume until maximum is reached.
Fn+F4 – Microphone Mute	Silences the on-board microphone so it cannot record audio. There is an LED on the F4 function key that notifies the user of the state of this feature: • LED off = microphone capable of recording audio • LED on = microphone muted and unable to record audio
Fn+F6—Scroll lock	Used as Scroll Lock key.
Fn+F8 – LCD and Projector display	Determines video output to LCD and external Video devices when attached and displays present.
Fn+F9 – Search	Mimics the Windows key + F keystroke to open Windows Search dialog box.
Fn+F10 – KB Illumination/ Backlight	Determines the Keyboard Illumination/Backlight brightness level. The hot key cycles through the following brightness states when pressed: Disabled, Dim, Bright. For more detail, see Keyboard Illumination/Backlight section.
Fn+F11 – Brightness Decrease	Decreases the stepping of LCD brightness for each press until minimum is reached. For details, see the LCD Brightness section.
Fn+F12 – Brightness Increase	Increases the stepping of LCD brightness for each press until maximum is reached. For details, see the LCD Brightness section.
Fn+PrintScreen – Radio On/Off	Toggles all the radios on and off. For example, WLAN, WWAN, and Bluetooth.
Fn+Insert – Sleep	Puts the system into the ACPI S3 State and does not wake the system.
Fn+RightCtrl – Context Menu	It is used as Context Menu key. (a.k.a. Right-Click menu)
Fn+Left Cursor—Home	It is used as Home key.
Fn+Right Cursor – End	It is used as End key.
Fn+B – Pause/Break	It is used as Pause/Break key. Specifically, Fn+B = Pause and Fn +Ctrl+B = Break.

4

Getting help

Contacting Dell

NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1 Go to **Dell.com/support.**
2 Select your support category.
3 Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4 Select the appropriate service or support link based on your need.