

Dell Latitude 5420 Rugged

Technical Guidebook



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.

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Chassis Overview

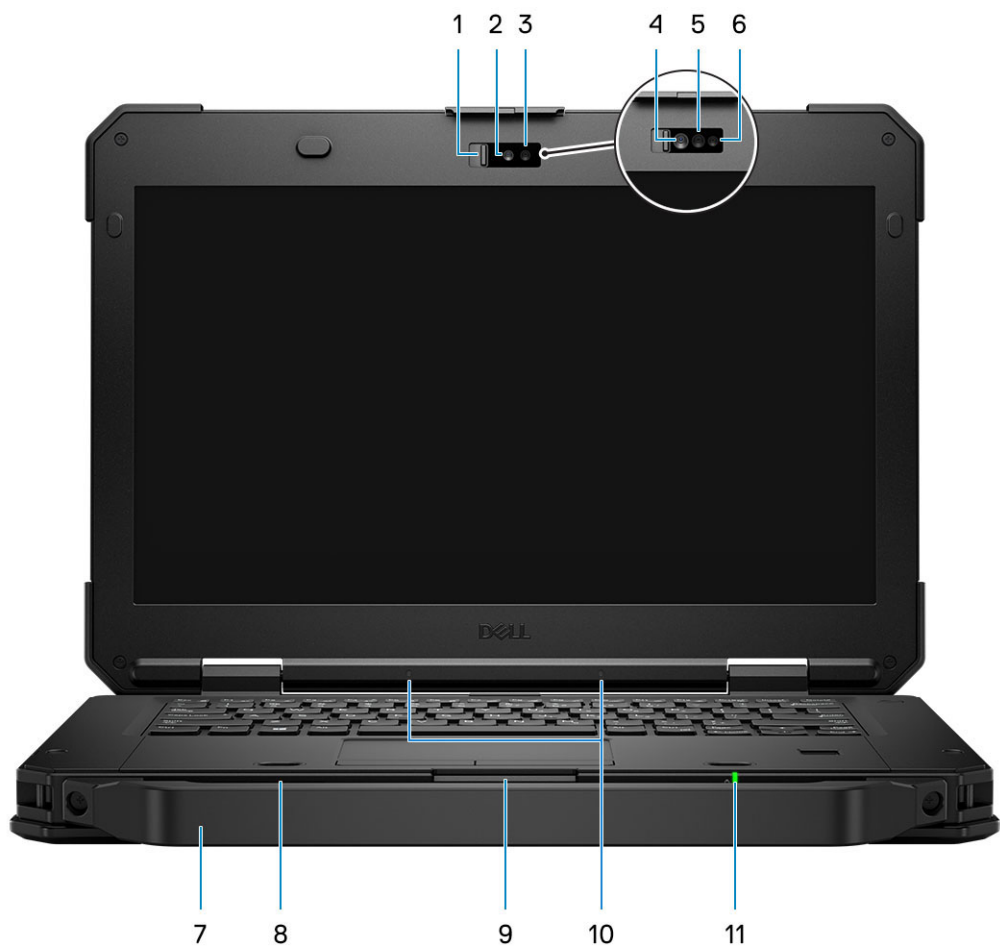
This chapter illustrates the multiple chassis views along with the ports and connectors called out.



Topics:

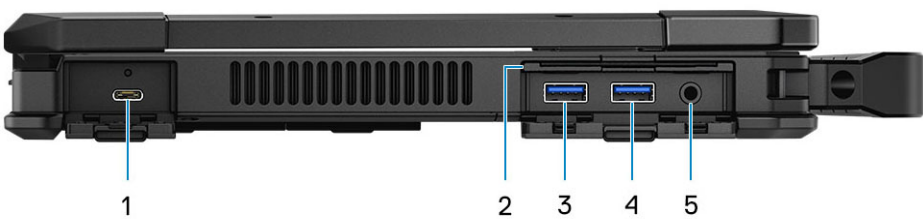
- [Front View](#)
- [Left Side View](#)
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- [Back View](#)

Front View



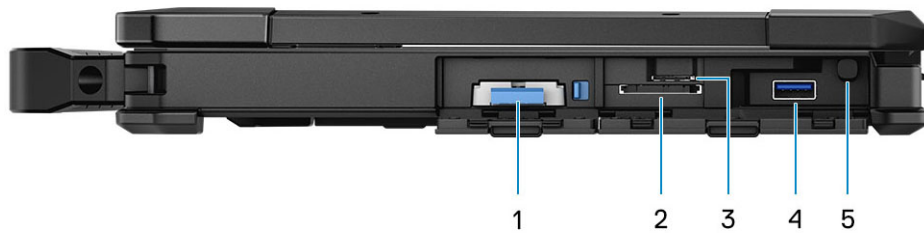
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|--------------------------|-------------------------|
| 1. Camera Shutter | 2. RGB Camera |
| 3. RGB Camera status LED | 4. IR Camera |
| 5. IR Emitter | 6. IR Camera status LED |
| 7. Handle | 8. Speakers |
| 9. LCD Latch | 10. Microphone array |
| 11. Battery Status LED | |

Left Side View



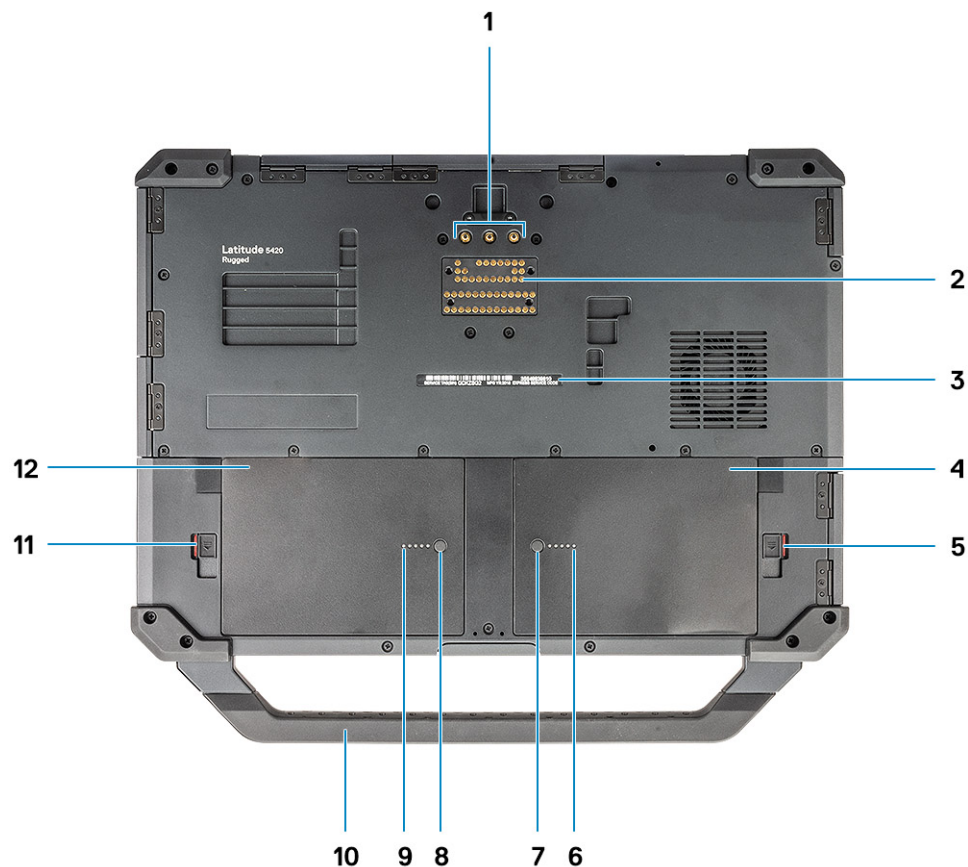
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| 1. USB Type-C DisplayPort Alt mode/USB 3.1 Gen2/Power Delivery | 2. Smart Card Reader |
| 3. USB 3.1 Gen 1 Type-A Port(with PowerShare) | 4. USB 3.1 Gen 1 Type-A Port |
| 5. 3.5 mm Universal audio port | |

Right Side View



- | | |
|------------------|---|
| 1. SSD | 2. SD Card Reader |
| 3. SIM Card Slot | 4. USB 3.1 Gen 1 Type-A Port (recessed USB, supports mini USB connection with doors shut) |
| 5. Stylus slot | |

Bottom View



- | | |
|--|---------------------------------------|
| 1. Radio frequency pass-through connectors | 2. Docking port |
| 3. Service tag sticker | 4. Battery -1 |
| 5. Battery -1 Latch | 6. Battery -1 charge indicator LED |
| 7. Battery -1 charge indicator button | 8. Battery -2 charge indicator button |
| 9. Battery -2 charge indicator LED | 10. Handle |
| 11. Battery -2 Latch | 12. Battery -2 (Optional) |

Top view



- 1. Power button
- 3. Touch pad

- 2. Keyboard
- 4. Fingerprint reader (optional)

Back View



- | | |
|---|--|
| 1. Ethernet Port (Optional Rear configurable I/O) | 2. VGA Port (Optional Rear configurable I/O) |
| 3. Serial Port | 4. Ethernet Port Port |
| 5. HDMI 2.0 Port | 6. T-Bar Lock Slot |
| 7. DC-In(Power) Port | |

CAUTION: EXPLOSION HAZARD—External connections (power adapter port, HDMI port, USB ports, RJ45 port, serial ports, audio port, Smart Card reader slot, SD card reader slot, Express Card reader slot, PC card reader slot, SIM card slot) should not to be used in a hazardous location.

WARNING: Do not block, push objects into, or allow dust to accumulate in the air vents. Do not store your Dell computer in a low-airflow environment, such as a closed briefcase, while it is running. Restricting the airflow can damage the computer. The computer turns on the fan when the computer gets hot. Fan noise is normal and does not indicate a problem with the fan or the computer.

System information

The system information chapter provides detailed information of your computer.

Topics:

- [Product overview](#)
- [Product Comparison](#)
- [Technical specifications](#)

Product overview

The new Dell Latitude 5420 Rugged is next in line to the generation of Rugged Latitude 5000 series. This series delivers the highest levels of performance, newest technologies, high levels of configurability, and premium industrial design to professionals that run industry-specific applications as part of their daily field activities.

The Dell Latitude 5420 Rugged is a versatile solution that packs the power and performance of a workstation into a class leading rugged form factor. It is a powerful laptop designed for highly mobile professionals, who needs to run mission critical applications in the office, at the job site, at home, or at the field. The Dell Latitude 5420 Rugged is the successor of Dell Latitude 5414.

The Dell Latitude 5420 Rugged is the most powerful and feature-rich rugged laptop, that gives users desktop replacement performance in a mobile form factor. It provides uncompromised performance for professionals that need to have fixed workstation performance in remote locations.

Features:

- Configurability options including Intel 6th, 7th, and 8th generation core and i3, i5, i7 Processors
- FHD panel with 1000 nit brightness
- Dual Hot Swappable Batteries
- Weight starting at 4.9 lb (Rugged 5420)
- 2133 / 2400 MHz memory with Super Speed options
- New AMD graphics option
- USB Type-C port for Power Docking
- IR Camera option
- ISV Certifications

Product Comparison

Table 1. Product comparison with predecessor model

	Latitude 5414	Latitude 5420 Rugged
Processor	• 6th Generation Intel Sky Lake (15 W) Dual Core i3/i5/i7	• 6th Generation Intel Sky Lake (15 W) Dual Core i5 • 7th Generation Intel Kaby Lake U (15 W) Quad Core i5/i7, Dual Core i3 • 8th Generation Intel Kaby Lake U (15 W) Quad Core i5/i7
Chipset	Intel Sky Lake chipset (integrated with the processor)	Intel Kaby Lake / Sky Lake (integrated with the processor)
Memory	DDR4 2133 MHz; 2 SoDIMM slots supporting up to 32 GB	• DDR4 2133 MHz; 2 SoDIMM slots supporting up to 32 GB (SkyLake U)

Table 1. Product comparison with predecessor model (continued)

	Latitude 5414	Latitude 5420 Rugged
		DDR4 2400 MHz; 2 SoDIMM slots supporting up to 32 GB (KabyLake U)
Storage	- None 2.5" HDD: Up to 1 TB, hybrid, OPAL SED options - SSD M.2 2280 SATA: Up to 512 GB, OPAL SED options 5.25" ODD (Optional)	- SSD M.2 2280 PCIe: Up to 1 TB, FIPS, OPAL, SED options - SSD M.2 2280 SATA: Up to 1 TB, FIPS, OPAL, SED options
Graphics	Integrated Intel HD 520 Graphics (Integrated in Intel 6th generation processors OR Radeon R7 M360 (Discrete))	Integrated - Intel HD Graphics 620 (Integrated in Intel 7th generation processors) - Intel UHD Graphics 620 (Integrated in Intel 8th generation processors) - Intel HD 520 Graphics (Integrated in Intel 6th generation processors) Discrete - AMD Radeon 540, 2 GB GDDR5 - AMD Radeon RX540, 4 GB GDDR5
Audio	Realtek ALC3235 Controller	Waves MaxxAudio 7.5
Communication	- Integrated Intel i219 10/100/1000 Mb/s Ethernet - Wi-Fi 802.11a/b/g/n/ac with Bluetooth 4.2 - WWAN 4G LTE Full Mini Card (optional) - Optional dedicated u-blox NEO-M8 GPS card	- Integrated Intel i219 10/100/1000 Mb/s Ethernet - Wi-Fi 802.11a/b/g/n/ac with Bluetooth 4.2 - WWAN 4G LTE Full Mini Card (optional) - Bluetooth 4.2 - Optional dedicated u-blox NEO-M8 GPS card
I/O connectors	- Three USB 3.1 ports (One with PowerShare) - One USB 2.0 - HDMI 1.4 - VGA Port - Two RJ-45 NIC ports - Two RS-232 Serial ports - One microphone/stereo headphone/speakers connector - one micro-SIM slot with security feature	- Three USB 3.1 Gen 1 ports (One with PowerShare and Power on/Wake-up support) - HDMI 2.0 - USB Type-C DisplayPort Alt mode/USB 3.1 Gen2/Power Delivery - Universal audio jack (Global Headset Jack + mic phone in + line in support) - RJ-45 connector - Serial RS-232 port Rear I/O space can be configured with RJ-45 along with following options: - Blank - no IO, blank bezel (FACTORY DEFAULT) - Serial RS-232 - VGA - DisplayPort - Fischer Port
Operating system	- Windows 10 Pro 64 bit - Windows 10 Home 64 bit	Windows 7 via Dell CFI †
BIOS	UEFI BIOS	UEFI BIOS

Table 1. Product comparison with predecessor model (continued)

	Latitude 5414	Latitude 5420 Rugged
AC adapter	65 W adapter, 7.4 mm barrel 65 W BFR/PVC halogen free adapter, 7.4 mm barrel 90 W adapter, 7.4 mm barrel	19.5 V @ 130 W & 90 W adapters through 7.4 mm DC-IN jack - USB Type-C DisplayPort Alt mode/USB 3.1 Gen2/Power Delivery
Battery	6 Cell 65 Whr 9 Cell 91 Whr	Option to have two or one: 3 Cell 51 Whr ExpressCharge capable battery 3 Cell 51 Whr Battery (Long-Life Cycle)
Weight (Pounds/Kilogram)	7.8 / 3.54	4.9 / 2.2 (without handle and bumpers)

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.

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
Intel Dual-Core i3-7130U Kaby Lake processor, Cache: 3 MB / # of Thread (T): 4 / Base Frequency : 2.7 GHz / Thermal Design Power (TDP): 15 W)	Intel HD Graphics 620
Intel Quad-Core i5-8350U Kaby Lake processor (6 MB / 8T / 1.7 GHz / 15 W)	Intel UHD Graphics 620
Intel Quad-Core i7-8650U Kaby Lake processor (8 MB / 8T / 1.9 GHz / 15 W)	Intel UHD Graphics 620
Intel Dual-Core i5-6300U Sky Lake processor (3MB / 4T / 2.4 Ghz / 15 W)	Intel HD Graphics 520

Memory

Table 3. Memory specifications

Memory configuration	
Minimum memory configuration	4 GB
Maximum memory configuration	32 GB
Number of slots	Two DDR4 SODIMM slots

Table 3. Memory specifications (continued)

Memory configuration	
Maximum memory supported per slot	16 GB
Memory options	8 GB - 2 x 4 GB/ 1 x 8 GB 16 GB - 2 x 8 GB 32 GB - 2 x 16 GB
Type	DDR4 SDRAM (Non-ECC memory only)
Speed	2400 MHz (Kaby Lake processor) 2133 MHz (Sky Lake procesor)

Base

Table 4. Base configurations

Base
- Intel Dual-Core i3-7130U Kaby Lake processor, Intel HD 620 UMA graphics, TPM - Intel Quad-Core i5-8350U Kaby Lake processor, Intel UHD 620 UMA graphics, TPM, vPro - Intel Quad-Core i5-8350U Kaby Lake processor, AMD Radeon 540(2GB/64-Bit) discrete graphics, TPM, vPro - Intel Quad-Core i5-8350U Kaby Lake processor, AMD Radeon RX540(4GB/128-Bit) discrete graphics, TPM, vPro - Intel Quad-Core i7-8650U Kaby Lake processor, AMD Radeon 540(2GB/64-Bit) discrete graphics, TPM, vPro - Intel Quad-Core i7-8650U Kaby Lake processor, AMD Radeon RX540(4GB/128-Bit) discrete graphics, TPM, vPro - Intel Dual-Core i5-6300U Sky Lake processor, Intel HD 520 UMA graphics, TPM

System information

Table 5. System Information

System chipset information	
Chipset	- Intel Kaby Lake U Dual Core (integrated with processor) - Intel Kaby Lake U Quad Core(integrated with processor) - Intel Sky Lake U Dual Core (integrated with processor)
DRAM bus width	64-bit
Flash EEPROM	SP1 128 Mbits
PCIe bus	100 Mhz
External bus frequency	DMI 3.0-8GT/s

System board connectors

Table 6. Internal M.2 System board connectors

Sockets	Options
M.2 (Socket 1, Key A)	Wireless Local Area Network (WLAN) / Wireless Gigabit Alliance (WiGig)
M.2 (Socket 3, Key M)	SATA / PCIe x2 or PCIe x4 SSD
M.2 (Socket 2, Key B)	SSD / Wireless Wide Area Network (WWAN)

Storage

Table 7. Storage specifications

Type	Form factor	Interface	Security option	Capacity
(SSD, FIPS, SED, Opal)		M.2 2280 SSD PCIe x4	FIPS, SED, Opal	• 128 GB • 1 TB • 2 TB • 1TB OPAL SED • 500 GB • 1 TB • 500 GB FIPS 140-2 compliant SED

Audio

Table 8. Audio specifications

Controller	ALC3254
Type	Mono-channel
Speakers	One
Interface	• Universal Stereo headset/mic combo • Rugged quality speakers • Noise reducing array microphones
Internal speaker amplifier	2 W (RMS)

Graphics Specifications

Table 9. Graphics specifications

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
Intel HD 620 Graphics	UMA	Intel Core i3 - 7130U	Integrated	Shared system memory	HDMI 2.0	4096×2304 @60 Hz
Intel UHD 620 Graphics	UMA	Intel Core i5 - 8350U	Integrated	Shared system memory	HDMI 2.0	4096×2304 @60 Hz
Intel HD 520 Graphics	UMA	Intel Core i5-6300U	Integrated	Shared system memory	HDMI 2.0	4096×2304 @60 Hz
AMD Radeon 540	Discrete	Intel Core i5 - 8350U Intel Core i7 - 8650U	Discrete	Dedicated, 2 GB DDR5	HDMI 2.0 Additional video ports via Rear Configurable IO Space • VGA • DisplayPort	4096×2304 @60 Hz

Table 9. Graphics specifications (continued)

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
AMD Radeon RX540	Discrete	Intel Core i5 - 8350U Intel Core i7 - 8650U	Discrete	Dedicated, 4 GB DDR5	HDMI 2.0 Additional video ports via Rear Configurable IO Space - VGA - DisplayPort	4096×2304 @60 Hz

i **NOTE:** Additional video ports via Rear Configurable IO Space is available with discrete graphics solution only.

Camera

Table 10. Camera specifications

Resolution	Camera: - Still image: 0.92 megapixels - Video: 1280×720 at 30 fps Infrared camera (optional): - Still image: 0.30 megapixels - Video: 340×340 at 60 fps
Diagonal viewing angle	- Camera - 86.7 degrees - Infrared camera - 70 degrees

Communication

Table 11. Communication specifications

Network Adapter	Specifications
Ethernet	Integrated Intel i219LM 10/100/1000 Mb/s Ethernet (RJ-45) with Intel Remote Wake UP, PXE and Jumbo frames support. (2nd NIC in rear configurable IO space)
Wireless LAN(Optional)	- Intel Dual Band Wireless AC 8265 (802.11ac) 2x2 + Bluetooth 4.2 - Intel Dual Band Wireless AC 8265 (802.11ac) 2x2 (No BT) - Dell Wireless 1820 - 802.11a/b/g/n/ac Dual Band (2x2) WiFi + Bluetooth 4.2
Wireless WAN(Optional)	Qualcomm Snapdragon X20 Global Gigabit LTE
Global Positioning System(GPS) Module (Optional)	U-blox NEO-M8 dedicated GPS card

External Ports and connectors

Table 12. External Ports and connectors

Ports	Specifications
USB	One USB 3.1 Gen 1 Type-A port with PowerShare and Power on/Wake-up support

Table 12. External Ports and connectors (continued)

Ports	Specifications
	- Two USB 3.1 Gen 1 Type-A ports - One USB Type-C DisplayPort Alt mode/USB 3.1 Gen2/ Power Delivery
Security	T-Bar Slot
Docking port	- USB Type-C Monitor Stand/Dock - Latitude USB Type-C Dock - Dell Rugged Family Pogo Dock (backward compatible with Gen 2)
Audio	- Universal audio jack (Global Headset Jack + mic phone in + line in support) - No / Noise reduction dual array microphones
Video	HDMI 2.0
Network adapter	One RJ-45 connector
Serial port	One legacy Serial RS-232 port
Rear Configurable I/O Space	- Blank - no IO, blank bezel (FACTORY DEFAULT) 2nd Gigabit RJ-45 + 2nd RS-232 2nd Gigabit RJ-45 + VGA OUT 2nd Gigabit RJ-45 + DisplayPort Out (full-size) 2nd Gigabit RJ-45 + Fischer
SIM card reader	One micro SIM card reader

Media card-reader

Table 13. Media-card reader specifications

SD card reader specifications	
Type	One SD-card slot
Supported cards	- SD - SDHC - SDXC

Smart card reader

Table 14. Contactless smart card reader

Type	FIPS 201 Contacted / Contactless Smart Card reader
ISO certification	ISO14443A

Hardware and Software Security

Table 15. Hardware Security

Hardware Security	
TPM 2.0 FIPS 140-2 Certified, TCG Certified* * TCG certification (February 2018)	Yes, Discrete TPM 2.0 IC (Backward downgradable to 1.2)
BIOS disable TPM (China/Russia)	Yes
Optional Control Vault 2.0 Advanced Authentication with FIPS 140-2 level 3 certification (HW authentication configurations)	Yes, TCG Certified (February 2018)
Optional hardware authentication bundle 2: - FIPS 201 contacted smart card - Control Vault 2.0	Yes
Optional hardware authentication bundle 4: - Touch finger print reader - FIPS 201 contacted smart card - Contactless smart card - NFC - Control Vault 2.0	Yes - Synaptics Fingerprint reader - Synaptics Smart Card Reader + Contactless Smart Card
Security lock slot (Kensington T-Bar Lock Slot)	Yes
SED (Opal 2.0 - SATA Interface)	Yes
Statement of Non-Volatility	Yes
Bundle 6 Control Vault 2 and touch fingerprint	Yes
POA: Power On Authentication	Yes(Supported with Fingerprint reader only)

Table 16. Software Security

Software security	
Latitude Security software per software functional plan/cycle list	Yes
D-Pedigree for BIOS (Secure Supply Chain Functionality) provides: - Secure Supply Chain for a Product covers BIOS Image Integrity - Chain of Custody - Part Traceability	Yes

Display

Table 17. Display specifications

Type	Full HD Touch/Non-Touch
Screen size (Diagonal)	14 inch (16:9)
LCD Panel technology	FHD (1920x1080)
Display	Non Touch / Touch (10 finger PCAP Glove/Water/Stylus capable)
Native Resolution	1920x1080
High Definition	Yes

Table 17. Display specifications (continued)

Luminance	Standard Brightness (SB):220 NIT / Outdoor Viewable(OV) :1000 NIT
Height	173.95 mm / 6.85 (display area)
Width	309.4 mm / 12.18 inch
Megapixels	2.07
Pixels Per Inch (PPI)	157
Pixel pitch	0.161 mm
Color depth	16.2M colors (OV) / 262K (SB)
Contrast ratio (typical)	1500 (OV) / 700 (SB)
Response time(max)	35 ms
Refresh rate	60 Hhz
Horizontal viewing angle	85/85°
Vertical viewing angle	85/85°
Stylus support	Yes, Passive

Keyboard

Table 18. Keyboard specifications

Number of keys	83 keys: US English, Thai, French-Canadian, Korean, Russian, Hebrew, English-International 84 keys: UK English, French Canadian Quebec, German, French, Spanish (Latin America), Nordic, Arabic, Canada Bilingual 85 keys: Brazilian Portuguese 87 keys: Japanese
Size	Six row keyboard - X= 19.05 mm key pitch - Y= 19.05 mm key pitch
Backlit keyboard	None / RGB Backlight / Rubberized Sealed
Layout	QWERTY / AZERTY / Kanji

Touchpad

Table 19. Touchpad Specifications

Resolution	- Horizontal: 305 - Vertical: 305
Dimensions	- Width: 4.13 inch (105 mm) - Height: 2.36 inch (60 mm)
Multi-touch	Supports four - fingers multi-touch

Table 19. Touchpad Specifications (continued)

Touchpad gestures	For more information about touchpad gestures available on Windows, see the Microsoft knowledge base article 4027871 at support.microsoft.com .
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Battery

Table 20. Battery Specifications

Type	3-cell 51 Whr (ExpressCharge) 3-cell 51 Whr (Long-Life Cycle, includes 3 year limited warranty)
Dimension	- Length: 128.4 mm (5.05 inch) - Width: 86.3 mm (3.39 inch) - Height: 15.3 mm (0.60 inch)
Weight (maximum)	237.00 g (0.52 lb)
Voltage	51 WHr - 11.4 VDC
Life Span	300 discharge/recharge cycles
Charging time when the computer is off (approximate)	2 hours(with one battery) / 4 hours (with two batteries)
Operating time	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.
Temperature range: Operating	0°C to 60°C (32°F to 140°F)
Temperature range: Non-Operating	-40°C to 70°C (-40°F to 158°F)
Coin-Cell battery	3 V, CR2032, lithium ion

Power adapter

Table 21. Power adapter specifications

Type	19.5 V @ 130 W & 90 W adapters through 7.4 mm Normal and Elbow Barrel - USB Type-C with PD (Power Distribution) - Via Dock supporting a NVDC charger architecture
Input Voltage	100 VAC to 240 VAC
Input current (maximum)	90 W - 1.5 A 130 W - 2.5 A
Adapter size	7.4 mm
Input frequency	50 Hz to 60 Hz
Output current	90 W - 4.62 A (continuous) 130 W - 6.7 A (continuous)
Rated output voltage	19.5 VDC

Table 21. Power adapter specifications (continued)

Temperature range (Operating)	0°C to 40°C (32°F to 104°F)
Temperature range (Non-Operating)	- 40°C to 70°C (-40°F to 158°F)

Physical system dimensions

Table 22. Weight

Chassis weight (pounds / kilograms)	4.9 / 2.2 (without handle and bumpers)
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Table 23. Chassis dimensions

Dimensions	Vectors
Height (inches / centimeters)	13.67 / 34.70
Width (inches / centimeters)	9.63 / 24.45
Depth (inches / centimeters)	1.29 / 3.28
Shipping weight (pounds / kilograms - includes packaging material)	7.5 / 3.40

Table 24. Packaging parameters

Dimensions	Vectors
Height (inches / centimeters)	44.5 / 17.52
Width (inches / centimeters)	8.2 / 3.2
Depth (inches / centimeters)	34.1 / 13.42

Computer environment

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

Table 25. Computer environment

		Operating	Storage
Temperature range		-29°C to 63°C (-20.2°F to 145.4°F)	-51°C to 71°C (-59.8°F to 159.8°F)
Relative humidity (maximum)		10% to 80% (non-condensing)  NOTE: Maximum dew point temperature = 26°C	10% to 95% (non-condensing)  NOTE: Maximum dew point temperature = 33°C
Vibration (maximum)	Vertical	• 1.04 GRMS • 0.20 GRMS • 0.74 GRMS	• 2.24 GRMS • 1.45 GRMS • 1.32 GRMS
	Transverse		
	Longitudinal		

Table 25. Computer environment (continued)

	Operating	Storage
Shock (maximum)	40 G [†] , 11 ms, saw-tooth, 3 shocks +/- per axis, 3 axes	185 G [‡] , 2 ms half sine; 2 shocks/axis/direction for a total of 12 shocks
Altitude (maximum)	Chamber at 15,000 ft for 1 hour	Chamber at 30,000 ft for 1 hour

* 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.

Regulatory and Environmental Compliance

Table 26. Regulatory and Environmental Compliance specifications

• Energy Star Version 7[¶] • EPEAT Silver Registered* • TAA configurations available • IP53 rated • MIL 810G * : For specific country participation and rating, please see https://ww2.epeat.net/ ¶ : Available on select configurations offered with single hard drive with both UMA and Discrete chipset.

Operating system

Your Latitude 5420 Rugged supports the following operating systems:

- Windows 7 via Dell CFI [†]

Dell support policies

For more information on support policy, see the knowledge base articles [000181418](#), [000043920](#), and [000181188](#).

Engineering specifications

This chapter lists out the specification of each and every component in a comprehensive format. Specific features/models/configurations/options discussed in the document may or may not be available.

Topics:

- Chipset
- Graphics options
- System board connectors
- Display Specifications
- Corning Gorilla Glass
- Hard drives
- Smart card support
- Security Option - Fingerprint Reader
- Communications Specifications
- E5 series AC Adapter
- Monitors
- Audio devices
- Cables, Dongles, and adapters
- Handles
- Carrying case
- Docks and port replicators
- External data storage
- Docks and Stands
- Input devices
- Security devices
- Hot key definition
- Out-of-Band Systems Management- Intel vPro and Intel Standard Manageability
- Operating system
- Miscellaneous software

Chipset

Table 27. Chipset specifications

Type	Intel Q370
Non-volatile memory on chipset	Yes
BIOS configuration SPI (Serial Peripheral Interface)	128 Mbit (16MB) located at SPI_FLASH on chipset
TPM 2.0 security device (Trusted Platform Module)	TPM 2.0 (TPM 1.2 - Firmware downgradable), available in select countries
TPM disabled	Available in select countries
NIC EEPROM	LOM configuration contained within SPI_FLASH – no dedicated LOM EEPROM

Graphics options

Intel HD Graphics Integrated

Intel HD graphics 620

This system can be configured with either of the following UMA graphic options or combined with any of the AMD discrete graphics options.

Table 28. Intel HD graphics 620 specification

Integrated Graphics Controller	Intel HD Graphics 620
Bus Type	Internal PCIe
Memory Interface	N/A (unified memory architecture)
Graphics Level	GT2
Estimated Maximum Power Consumption (TDP)	15 W (included in the CPU power)
Display Support	On System: HDMI 2.0 USB Type-C
Maximum Vertical Refresh Rate	Up to 85 Hz depending on resolution
Operating Systems Graphics Video API Support	Support for DirectX 12, OpenCL 2.0, OpenGL 4.3/4.4, OpenGL ES
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	System ports: Max Digital: (HDMI) 2560x1600, 4096x2304@24 Hz Docked: • Max Digital: (DisplayPort 1.2) 3840 x2160 @60 Hz • Max Digital: (SL-DVI) 1920x1080 @60 Hz • Analog: (VGA) system (14 inch/15 inch) 2048x1152 @60 Hz For 3 displays : up to max resolution each above
Numbers of Displays Supported	• System Ports: 3 displays max with LCD plus 2 displays max on each output (HDMI, USB Type-C) • Docked: 3 displays max (combo of LCD, VGA, DP, HDMI)

Intel UHD Graphics 620

Table 29. Intel UHD Graphics 620 (8th Generation Intel Core) specification

Integrated Graphics Controller	Intel UHD Graphics 620 (8th Generation Intel Core)
Bus Type	Internal PCIe
Memory Interface	N/A (unified memory architecture)
Graphics Level	GT2
Estimated Maximum Power Consumption (TDP)	15 W (included in the CPU power)
Display Support	On System: HDMI 2.0 USB Type-C

Table 29. Intel UHD Graphics 620 (8th Generation Intel Core) specification (continued)

Integrated Graphics Controller	Intel UHD Graphics 620 (8th Generation Intel Core)
Maximum Vertical Refresh Rate	Up to 85 Hz depending on resolution
Operating Systems Graphics Video API Support	DirectX 11 (Windows 7/8.1), DirectX 12 (Windows 10, Windows 11), OpenGL 4.3
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	System ports: - Max Digital: (HDMI) 4096x2304@24 Hz - Analog: (VGA) system (14 inches/15 inches) or docking 2048x1152 @60 Hz Docked: - Max Digital: (DisplayPort 1.2) 3860 x2160 @60 Hz - Max Digital: (SL-DVI) 1920x1080 @60 Hz - Analog: (VGA) system (14 inches/15 inches) 2048x1152 @60 Hz For 3 displays: (native or docked) up to 1920x1200 max resolution each
Numbers of Displays Supported	- System Ports - 3 displays max with LCD plus 1 display max on each output (HDMI, VGA (14 inches/15 inches)) - Docked - 3 displays max (combo of LCD, VGA, DP, HDMI)

Intel HD Graphics 520

Table 30. Intel HD Graphics 520 Graphics specification

Integrated Graphics Controller	Intel UHD Graphics 620 (8th Generation Intel Core)
Bus Type	Internal PCIe
Memory Interface	N/A (unified memory architecture)
Graphics Level	GT2
Estimated Maximum Power Consumption (TDP)	15 W (included in the CPU power)
Display Support	On System: HDMI 2.0 USB Type-C
Maximum Vertical Refresh Rate	Up to 85 Hz depending on resolution
Operating Systems Graphics/ Video API Support	DirectX 11 (Windows 7/8.1), DirectX 12 (Windows 10, Windows 11), OpenGL 4.3
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	System ports: - Max Digital: (HDMI) 4096x2304@24 Hz - Analog: (VGA) system (14 inches/15 inches) or docking 2048x1152 @60 Hz Docked: - Max Digital: (DisplayPort 1.2) 3860 x2160 @60 Hz - Max Digital: (SL-DVI) 1920x1080 @60 Hz - Analog: (VGA) system (14 inches/15 inches) 2048x1152 @60 Hz For 3 displays: (native or docked) up to 1920x1200 max resolution each

Table 30. Intel HD Graphics 520 Graphics specification (continued)

Integrated Graphics Controller	Intel UHD Graphics 620 (8th Generation Intel Core)
Numbers of Displays Supported	- System Ports - 3 displays max with LCD plus 1 display max on each output (HDMI, VGA (14 inches/15 inches)) - Docked - 3 displays max (combo of LCD, VGA, DP, HDMI)

AMD Radeon 540 Graphics

Table 31. Radeon 540 Graphics specifications

Graphics Controller	AMD Radeon 540 Graphics
Graphics memory	2 GB GDDR5
Bus type	PCIe x16 Gen3
Memory Interface	64-bit
Clock Speeds	Up to 1124 MHz
Estimated Maximum Power Consumption (TDP)	50W TGP (GPU + frame buffer)
Display Support	HDMI/mDP/eDP/USB-C
Maximum Color Depth	Maximum 4:4:4 Color Depth:12 (bits per pixel)
Maximum Vertical Refresh Rate	Up to 85 Hz depending on resolution
Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL 4.5
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or digital)	- Single DisplayPort 1.4 - 5120 x 2880 @ 60 Hz - Dual DisplayPort 1.4 - 5120 x 2880 @ 60 Hz
Numbers of Display Support	Up to five displays operating at 4096 x 2160 @60 Hz

AMD Radeon RX 540 Graphics

Table 32. Radeon RX 540 graphics specifications

Graphics Controller	AMD Radeon RX 540 Graphics
Graphics memory	4 GB GDDR5
Bus type	PCIe x16 Gen3
Memory Interface	128 bit
Clock Speeds	Up to 1219 MHz
Estimated Maximum Power	50W TGP (GPU + frame buffer)
Display Support	eDP/DVI/ DisplayPort/HDMI
Maximum Color Depth	Maximum 4:4:4 Color Depth:12 (bits per pixel)
Maximum Vertical Refresh Rate	Up to 395 Hz at 1920 x 1080 Up to 118 Hz at 3840 x 2160

Table 32. Radeon RX 540 graphics specifications (continued)

Graphics Controller	AMD Radeon RX 540 Graphics
Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL 4.5
Supported Resolutions and Max Refresh Rates (Hz)	- Max Digital : Single DisplayPort 1.4 - 5120 x 2880 @ 60 Hz (mDP/USB Type-C to DP) - Max Digital : Dual DisplayPort 1.4 - 5120 x 2880 @ 60 Hz (mDP/USB Type-C to DP)
Numbers of Display Support	Up to five displays operating at 4096 x 2160 @60 Hz

System board connectors

Maximum add-in card allowable with dimensions

Table 33. M.2 (Socket 1, Key A)

Number of slots	1 (WLAN / WiGig)  NOTE: WiGig Not Supported with Kaby Lake R
Voltage	3.30/12.0V
Height (inches / centimeters)	4.38/11.12
Length (inches / centimeters)	4.50/11.44
Maximum wattage	10 W

Table 34. M.2 (Socket 2, Key B)

Number of slots	1 (PCIe x4 SSD / WWAN)
Voltage	3.30/12.0V
Height (inches / centimeters)	4.38/11.12
Length (inches / centimeters)	4.50/11.44
Maximum wattage	10 W

Table 35. M.2 (Socket 3, Key M)

Number of slots	1 (SATA / PCIe x 2 or x 4 SSD)
Voltage	3.30/12.0V
Height (inches / centimeters)	4.38/11.12
Length (inches / centimeters)	4.50/11.44
Maximum wattage	10 W

Display Specifications

Table 36. Display Specifications

Display Options
• 14" FHD Wide View Angle(WVA) (1920 x 1080) Anti-Glare Non-Touch, No Camera & No Microphone • 14" FHD WVA (1920 x 1080) Anti-Glare Non-Touch, Camera with Privacy Shutter & Microphone • 14" FHD WVA (1920 x 1080) Anti-Glare Non-Touch, Outdoor-Readable Screen, Camera with Privacy Shutter & Microphone • 14" FHD WVA (1920 x 1080) Anti-Glare Non-Touch, Outdoor-Readable Screen, No Camera & No Microphone • 14" FHD WVA (1920 x 1080) Embedded Touch, Outdoor-Readable Screen, Camera with Privacy Shutter & Microphone, Stylus included • 14" FHD WVA (1920 x 1080) Embedded Touch, Outdoor-Readable Screen, Infra Red(IR) Camera with Privacy Shutter & Microphone, Stylus included • 14" FHD WVA (1920 x 1080) Embedded Touch, Outdoor-Readable Screen, No Camera & No Microphone, Stylus included

Corning Gorilla Glass

Corning Gorilla Glass 5: Corning’s latest composition was formulated to address breakage the #1 consumer complaint, according to Corning’s research. The new glass is just as thin and light as previous versions, but has been formulated to deliver dramatically improved native damage resistance allowing improved in-field performance. Corning Gorilla Glass 5 has been tested for performance when subjected to sharp contact damage, such as asphalt and other real-world surfaces.

Benefits

- Enhanced retained strength after use.
- High resistance to scratch and sharp contact damage.
- Improved drop performance.
- Superior surface quality.

Applications

- Ideal protective cover for electronic displays in:
 - Smartphones
 - Laptop and tablet computer screens
 - Wearable devices
- Touchscreen devices
- Optical components
- High strength glass articles

Dimensions

Thickness: 0.7 mm

Viscosity

Table 37. Viscosity

Parameters	Vectors
Softening Point ($10^{7.6}$ poises)	884 °C
Annealing Point ($10^{13.2}$ poises)	623 °C
Strain Point ($10^{14.7}$ poises)	571 °C

Properties

Table 38. Properties

Density	2.43 g/cm
Youngs Modulus	76.7 GPa
Poissons Ratio	0.21
Shear Modulus	31.7 GPa
Vickers Hardness (200 g load)	
- Un-strengthened - Strengthened	489 kgf/mm ² 596 kgf/mm ² 596 kgf/mm ²
Fracture Toughness	0.69 MPa m ^{0.5}
Coefficient of Expansion (0 °C - 300 °C)	78.8 x 10 ⁻⁷ /°C

Chemical Strengthening

Capability of >850MPa CS, at 50 µm Depth Of Layer(DOL)

Specifications subject to change

Optical

Table 39. Optical

Refractive Index (590 nm)	
Core glass**	1.50
Compression layer	1.51
Photo-elastic constant	30.3 nm/cm/MPa

** Core index is used for FSM-based measurements since it is unaffected by ion-exchange conditions.

Chemical Durability

Durability is measured via weight loss per surface area after immersion in the solvents shown below. Values are highly dependent upon actual testing conditions. Data reported is for Corning Gorilla Glass 5.

Table 40. Chemical Durability

Reagent	Time	Temperature (°C)	Weight Loss (mg/cm ²)
HCl - 5%	24 hrs	95	5.9
NH ₄ F:HF - 10%	20 min	20	1.0
HF - 10%	20 min	20	25.2
NaOH - 5%	6 hrs	95	2.7

Electrical

Table 41. Electrical

Frequency (MHz)	Dielectric Constant	Loss Tangent
54	7.08	0.009
163	7.01	0.010
272	7.01	0.011
272	7.00	0.010
490	7.99	0.010
599	7.97	0.011
912	7.01	0.012
1499	6.99	0.012
1977	6.97	0.014
2466	6.96	0.014
2986	6.96	0.014

Terminated coaxial line similar to that outlined in NIST Technical Notes 1520 and 1355-R

Putting Corning Gorilla Glass 5 to the test.

- Greater damage resistance (upto 1.8X) with deep abrasion.
- Faster chemical strengthening with high Compressive Stress and deeper depth of compression
 - Shallower check depth with higher abrasions levels
- Enables thickness reduction

Hard drives

Supported hard drives

128 GB M.2 2280 PCIe SSD

Table 42. 128GB M.2 2280 PCIe SSD

Details	Specifications
Capacity (GB)	128
Dimensions mm (W x D x H)	22 x 80 x 2.38
Interface type and Maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	800k hours
Logical Blocks	250,069,680
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%

Table 42. 128GB M.2 2280 PCIe SSD (continued)

Details	Specifications
Non-Op Shock (@0.5ms)	1500G
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

256 GB M.2 NVMe PCIe SSD Class 40

Table 43. 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%

256 GB M.2 NVMe PCIe SED SSD Class 40

Table 44. 256 GB M.2 NVMe PCIe SED 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	800 K hours
Logical blocks	500,118,192
Power source	
Power consumption (reference only)	Idle 1.7 W, Active 4.5 W

Table 44. 256 GB M.2 NVMe PCIe SED SSD Class 40 (continued)

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 45. 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%

512 GB M.2 NVMe PCIe SED SSD Class 40

Table 46. 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

Table 46. 512 GB M.2 NVMe PCIe SED SSD Class 40 (continued)

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 SSD Class 40

Table 47. 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%

1 TB M.2 NVMe PCIe SED SSD Class 40

Table 48. 1 TB M.2 NVMe PCIe SED SSD Class 40

Capacity (GB)	1 TB
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Table 48. 1 TB M.2 NVMe PCIe SED SSD Class 40 (continued)

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%

2 TB M.2 2280 PCIe SSD

Table 49. 2 TB M.2 2280 PCIe SSD

Details	Specifications
Capacity (GB)	1024
Dimensions mm (W x D x H)	22 x 80 x 3.73
Interface type and Maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	800k hours
Logical Blocks	4,294,967,295
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%
Non-Op Shock (@0.5ms)	1500G
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

Smart card support

Table 50. 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	
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 boot), 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.

Security Option - Contacted Smartcard Reader

Table 51. Contacted Smartcard Reader

Type	Description	Dell ControlVault2.0 Smartcard Reader
ISO 7816 -3 Class A Card Support	Reader capable of reading 5 V powered smartcard	Yes
ISO 7816 -3 Class B Card Support	Reader capable of reading 3 V powered smartcard	Yes
ISO 7816 -3 Class C Card support	Reader capable of reading 1.8 V powered smartcard	No
T=0 support	Cards support character level transmission	Yes
T=1 support	cards support block level transmission	Yes
EMVCo Compliant	Compliant with EMVCo (for electronic payment standards) smartcard standards as posted to www.emvco.com	Yes
EMVCo Certified	Formally certified based on EMVCO smartcard standards	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
FIPS 201 (PIV/HSPD-12) Compliant via GSA	Device compliant with FIPS 201/PIV/HSPD-12 requirements	Yes
ISO 7816-1 Compliant -	Specification for the reader	Yes
ISO 7816 -2 Compliant -	Specification for smartcard device physical characteristics (size, location of connection points, etc.)	N/A
Dell ControlVault support	Device connects to Dell ControlVault for usage and processing	Yes

Security Option - Contactless Smartcard Reader

Table 52. Contactless Smartcard Reader

Type	Description	Dell ControlVault 2 Contactless Smartcard Reader with NFC
Felica Card Support	Reader and software capable of supporting Felica contactless cards	No
Prox (Proximity) (125 kHz) Card support	Reader and software capable of supporting Prox/Proximity/125 kHz contactless cards	No

Table 52. Contactless Smartcard Reader (continued)

Type	Description	Dell ControlVault 2 Contactless Smartcard Reader with NFC
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
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
Host Interface	What physical interface is the reader connected to the host on?	USB
Windows Certified	Device certified by Microsoft WHCK	Yes
Dell ControlVault support	Device connects to Dell ControlVault for usage and processing	Yes

Table 53. Supported Cards

Manufacturer	Card	Supported
HID	jCOP readertest3 A card (14443a)	Yes
NXP/Mifare	Mifare DESFire 8K White PVC Cards	Yes
NXP/Mifare	Mifare Classic 1K White PVC Cards	Yes

Table 53. Supported Cards (continued)

Manufacturer	Card	Supported
NXP/Mifare	NXP Mifare Classic S50 ISO Card	Yes
G&D	idOnDemand - SCE3.2 144K	Yes
Oberthur	idOnDemand - OCS5.2 80K	Yes
HID	1430 1L	Yes
HID	DESFire D8H	Yes
Oberthur	ID-One Cosmo 64 RSA D V5.4 T=0 card	Yes
G&D	SCE6.0 FIPS 80K Dual+ 1 K Mifare	Yes
G&D	SCE6.0 nonFIPS 80K Dual+ 1 K Mifare	Yes
G&D	SCE6.0 FIPS 144K Dual + 1K Mifare	Yes
G&D	SCE6.0 nonFIPS 144K Dual + 1 K Mifare	Yes
G&D	SCE7.0 FIPS 144K	Yes

Security Option - Fingerprint Reader

Table 54. Fingerprint Reader

Category	Description	NB-2024-S2
Sensor Technology	Describes the technology of the sensor (Optical, thermal, capacitive, etc.)	Active Thermal
Sensor Resolution	Resolution of image captured by sensor	385dpi
Sensor Size	physical size of sensor	11.9 mm x 11.9 mm
Sensor Pixel Size	Amount of pixels used to capture image	180x180 pixels
Connection to Dell ControlVault 2.0	N/A	SPI
Dell ControlVault support	Device connects to Dell ControlVault for usage and processing	No
Dell ControlVault 2.0 support	Device connects to Dell ControlVault 2.0 for usage and processing . Enabled through Dell ControlVault driver .	Yes
Programmed False Accept Rate	Describes the programmed rate at which the fingerprint match algorithm is set to ensure false fingers are not accepted	0.10%
Programmed False RejectionRate	Describes the programmed rate at which the fingerprint match algorithm is set to inappropriately reject a proper finger	1.00%
Template storage	Describes the location of where templates are stored for future reference	Dell ControlVault encrypted
Markers to generate template	Number of markers utilized to generate a successful match of presented fingerprint	>12
Match on chip	Match of fingerprint occurs off host of main CPU to remove possibility of spoofing	No

Table 54. Fingerprint Reader (continued)

Category	Description	NB-2024-S2
FIPS 201 (PIV/HSPD-12) Certified	Device certified with FIPS 201/PIV/HSPD-12 requirements	No
ANSI/INCITS 378 standard support	Template creation process provides support for ANSI/INCITS 378 standard	Yes

Communications Specifications

This section explains about different communication options available.

Ethernet

The Intel I219LM Jacksonville WGI219LM family of Gigabit Ethernet controllers provides compact, single-port integrated physical layer devices that connect to the Intel Skylake chipsets.

The Intel WGI219LM is the corporate LAN product with support for Intel vPro; technology, Intel AMT2, Energy Efficient Ethernet (802.3az), Intel SIPP, and Server OS support.

Product Features

General

- 10 BASE-T IEEE 802.3 specification conformance
- 100 BASE-TX IEEE 802.3 specification conformance
- 1000 BASE-T IEEE 802.3 specification conformance
- Energy Efficient Ethernet (EEE)
- IEEE 802.3az support [Low Power Idle (LPI) mode]
- IEEE 802.3u autonegotiation conformance
- Supports carrier extension (half duplex)
- Loopback modes for diagnostics
- Advanced digital baseline wander correction
- Automatic MDI/MDIX crossover at all speeds of operation
- Automatic polarity correction
- MDC/MDIO management interface
- Flexible filters in PHY to reduce integrated LAN controller power
- Smart speed operation for automatic speed reduction on faulty cable plants
- PMA loopback capable (no echo cancel)
- 802.1as/1588 conformance
- Power Optimizer Support
- Intel Stable Image Platform Program (SIPP)
- Network proxy/ARP Offload support
- Up to 32 programmable filters
- No support for Gb/s half-duplex operation

Security and Manageability

- Intel vPro support with appropriate Intel chipset components

Performance

- Jumbo Frames (up to 9 Kb)

- 802.1Q & 802.1p
- Receive Side Scaling (RSS)
- Two Queues (Tx & Rx)

Power

- Ultra Low Power at cable disconnect (<1 mW) enables platform support for connected standby
- Reduced power consumption during normal operation and power down modes
- Integrated Intel Auto Connect Battery Saver (ACBS)
- Single-pin LAN disable for easier BIOS implementation
- Fully integrated Switching Voltage Regulator (iSVR)
- Low Power LinkUp(LPLU)

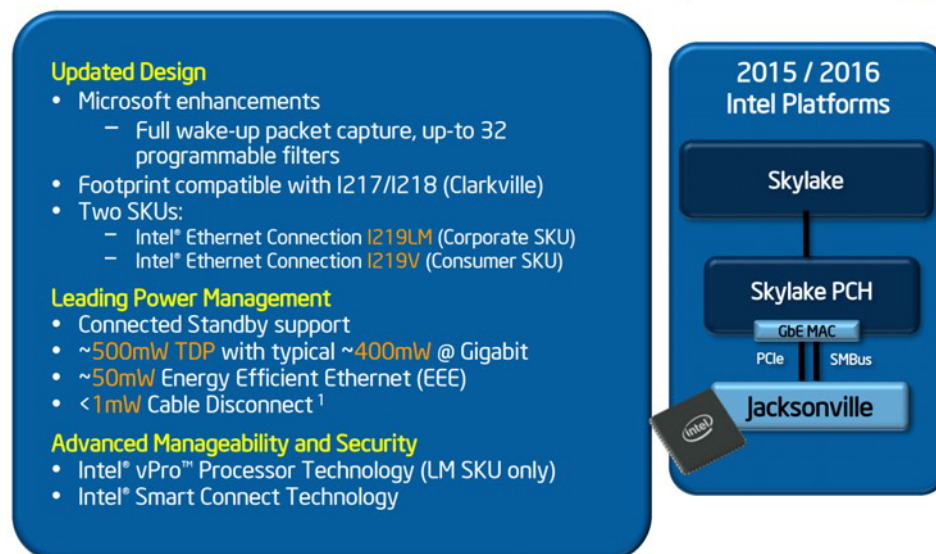
MAC/PHY Interconnect

- PCIe-based interface for active state operation (S0 state)
- SMBus-based interface for host and management traffic (Sx low power state)

Package/Design

- 48-pin package, 6x6mm with a 0.4 mm lead pitch and an Exposed Pad for ground
- Three configurable LED outputs
- Integrated MDI interface termination resistors to reduce BOM costs
- Reduced BOM cost by sharing SPI flash with PCH

Intel® Ethernet Connection I219 (Jacksonville)



Wireless communications

- Intel Dual Band Wireless AC 8265 (802.11ac) 2x2 + Bluetooth 4.2
- Intel Dual Band Wireless AC 8265 (802.11ac) 2x2 (No BT)
- Dell Wireless 1820 - 802.11a/b/g/n/ac Dual Band (2x2) WiFi + Bluetooth 4.2

Table 55. Dell Wireless 1820 - 802.11a/b/g/n/ac Dual Band (2x2) WiFi + Bluetooth 4.2

Attribute	Specification
Host interface	M.2 2230 form factor (WiFi– PCIe, Bluetooth – USB)
Network standard	802.11a, 802.11b, 802.11g, 802.11n and 802.11ac
Wi-Fi Alliance Certifications	802.11a, 802.11b, 802.11g, WPA, WPA2, WMM, 11ac, Wifi-Direct, WMM-Power Save, WifiProtected Setup, Voice-Personal
Operating Frequency Bands	2.4 GHz (802.11b/g/n) and 5 GHz (802.11a/n/ac)
Power range	2.4 GHz : 13 dBm – 18 dBm 5 GHz : 9.5 dBm – 16 dBm
Dual Stream N	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 Rate	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
Receive Sensitivity	802.11ac: -59 dBm @ 400 Mbps; - 57dBm @ 866.7 Mbps 802.11n/a: -67 dBm @ 300 Mbps ; -70 dBm @ 144.4 Mbps 802.11g/a: -75 dBm @ 54 Mbps 802.11b: -85 dBm @ 11 Mbps
Security Authentication EAP Methods	Open, Shared, WPA, WPA-PSK, WPA2, WPA2-PSK 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
Radio On/Off	Hardware and software on/off disables transmit and receive to comply with aviation in-flight restrictions
Roaming	Seamless roaming between 802.11a, 802.11b, 802.11b/g, 802.11n and 802.11ac access points
Wake On Wireless	Supported
Miracast (WiFi Display)	Native Miracast support by Windows 8.1 and 10
Wireless PAN Standard	Dual-mode Bluetooth 4.2, BLE
Bluetooth Data rates	Up to 3 Mbps
Bluetooth Operating Frequency Bands	2.4 GHz
Transmission	FHSS (Frequency Hopping Spread Spectrum)
Bluetooth Data Encryption	128-bit encryption
Bluetooth Receive Sensitivity	-70 dBm@BER≤0.01% (EDR) -100 dBm@BER≤30.8% (LE nominal)
Temperature	Operating temperature -10°C to +65°C Storage temperature of -45°C to +70°C
Humidity	Up to 90%

Table 55. Dell Wireless 1820 - 802.11a/b/g/n/ac Dual Band (2x2) WiFi + Bluetooth 4.2 (continued)

Attribute	Specification
Antennae	2x2
Transmit Peak Power	- Bluetooth: 23 dBm - WiFi: 20 dBm

Table 56. Intel Dual Band Wireless-AC 8265 (Windstorm Peak) 802.11AC Dual Band (2x2) WiFi + Bluetooth 4.2)

Attribute	Specification
Host interface	M.2 2230 and 1216-soldered down form factors (WiFi– PCIe, Bluetooth – USB)
Network standard	IEEE 802.11a/b/g/n/ac MU-MIMO RX
Wi-Fi Alliance Certifications	802.11a/b/g/n/ac, WPA, WPA2, WMM, WPS, Wi-Fi Direct
Operating Frequency Bands	2.4 GHz, 5 GHz
Power range	2.4 GHz : 13.5 dBm – 19 dBm 5 GHz : 9 dBm – 15 dBm
Dual Stream N	Support for two transmit and receive antennas enable better wireless at the same distance when compared to older 802.11a/b/g solutions.
Data Rate	Up to 867 Mbps
Power Consumption	Optimized power modes (sleep states) reduce power consumption during periods of inactivity
Authentication Authentication Protocols Encryption Product Safety	WPA and WPA2, 802.1X (EAP-TLS, TTLS, PEAP, LEAP, EAP-FAST), EAP-SIM, EAP-AKA PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2 64-bit and 128-bit WEP, 128-bit AES-CCMP UL, C-UL, CB (IEC60950-1)
Management Capabilities Alerting	Support for Intel AMT 11.8
Government Compliance	FIPS, FISMA
Client Utility	Intel PRO/Set Wireless Software v19.0 and later
Radio On/Off	Supported
Roaming	Supports seamless roaming between respective access points (802.11b, 802.11g, 802.11a/b/g, and 802.11a/b/g/n/ac)
Wake On Wireless	Supported
Wireless Display	Native Miracast support by Windows 8.1 and 10
Wireless PAN Standard	Dual Mode Bluetooth 4.2, BLE (HW ready, SW depends on OS, Windows 10 supports up to 4.1)
Bluetooth Data rates	Up to 3 Mbps
Bluetooth Operating Frequency Bands	2.4 GHz
Bluetooth Profiles Supported	For Windows 7, includes DID, HID, PAN, HCRP, SPP, HFP, HSP DUN, OPP, FTP, BIP, BPP, SYNCH, A2DP(source/sink), AVRCP (target/controller), HOGP (LE HID) Support for Microsoft Inbox Bluetooth profiles in Windows 8.1 and future OS versions
Bluetooth Data Encryption	128-bit encryption

Table 56. Intel Dual Band Wireless-AC 8265 (Windstorm Peak) 802.11AC Dual Band (2x2) WiFi + Bluetooth 4.2) (continued)

Attribute	Specification
Bluetooth Output Power	Power class 1
Temperature	Operating temperature 0°C to +50°C (Full performance at shield temperatures up to 80°C) Storage temperature of –40°C 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

Mobile Broadband - LTE-A WWAN

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

Table 57. Qualcomm Snapdragon X20 Global Gigabit LTE for AT&T and Verizon - US (DAO), South Korea, Taiwan, Indonesia and (EMEA/APJ/ROW)

Carrier	Verizon	AT&T	GCF Generic
Network	LTE CAT16	LTE CAT16	LTE CAT16
Speed (Downlink)	< 1 Gbps	< 1 Gbps	< 1 Gbps
Speed (Uplink)	< 150 Mbps	< 150 Mbps	< 150 Mbps
Fallback Network	NA	HSPA+	HSPA+
Fallback Speed (Downlink)	NA	HSPA+ 42 Mbps	HSPA+ 42 Mbps
Frequency Bands	LTE: 2/ 4/ 5/ 13	LTE: 2/ 4/ 5/ 12/ 14/ 29/ 30/ 66 WCDMA: 2/5	LTE: 1/2/3/4/5/7/8/12/13/14/17/ 18/19/20/25/26/28/29/30/3 2/38/39/40/41/42/43/46/4 8/66 WCDMA: 1/2/4/5/6/8/9/19
SIM	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
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
Host Interface	Supports both USB 3.0/2.0	Supports both USB 3.0/2.0	Supports 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

Optional GPS

Concurrent reception of GPS/QZSS, GLONASS, BeiDou with Industry leading –167 dBm navigation sensitivity combining low power consumption and high sensitivity

Table 58. GPS Module Specifications

U-blox NEO-M8 dedicated GPS card	
Interface	M.2
Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F, BeiDouB1 SBAS L1 C/A: WAAS, EGNOS, MSAS
Nav update rate	Single GNSS: up to 18 Hz Concurrent GNSS: up to 10 Hz
Position accuracy	2.0 m CEP

E5 series AC Adapter

This is to introduce the new AC power adapter family for Dell E5 series system. As a result of recent complexity reduction and cost savings efforts, Dell has found itself in a position of presenting its users with leveraged, generic adapter models that are shared with our competitors.

Dell has now decided to place investment into these adapters and elevate the look, feel, and performance. By using more attractive shapes and finishes, intelligent cable management, duckheads, and various other thoughtful details a better experience is created for the customer.

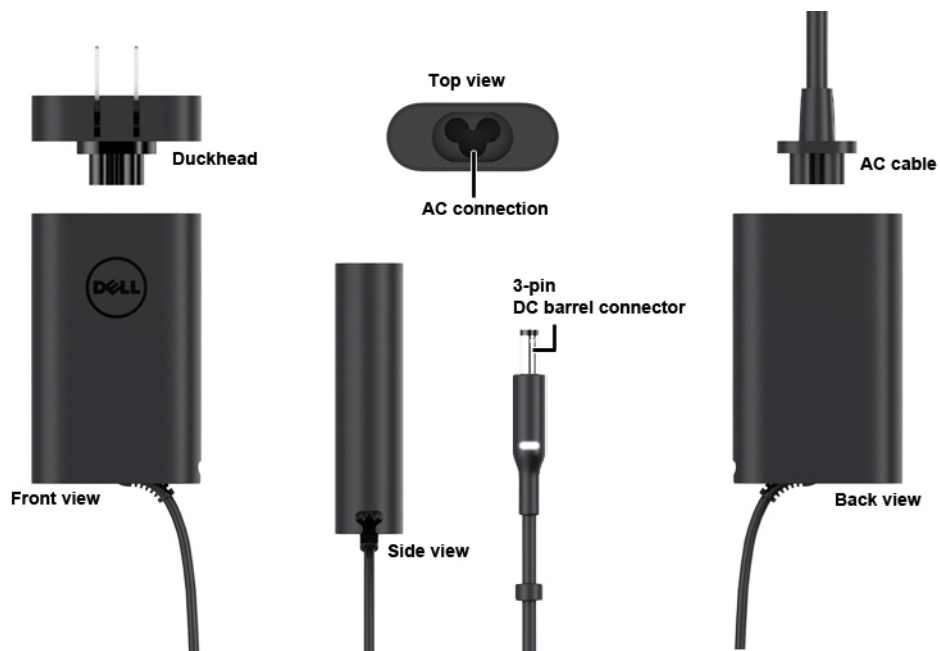
- 90W
- 130W



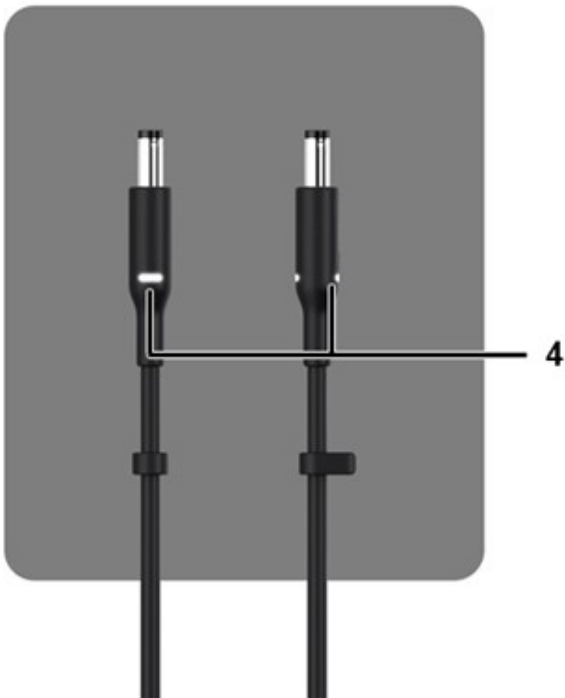
- ⚠ **CAUTION:** When you disconnect the AC adapter cable from the computer, grasp the connector, not the cable itself, and then pull firmly but gently to avoid damaging the cable.

⚠ **CAUTION:** The AC adapter works with electrical outlets worldwide. However, power connectors and power strips vary among countries. Using an incompatible cable or improperly connecting the cable to the power strip or electrical outlet may cause fire or equipment damage.

ℹ **NOTE:** Depending on the region, 2 or 3-pin adapters will be available. Please verify part numbers from RSL before replacing the AC Adapter.



LED and Cable



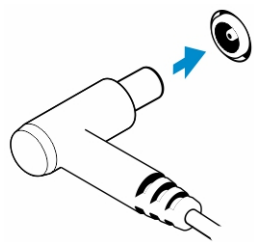
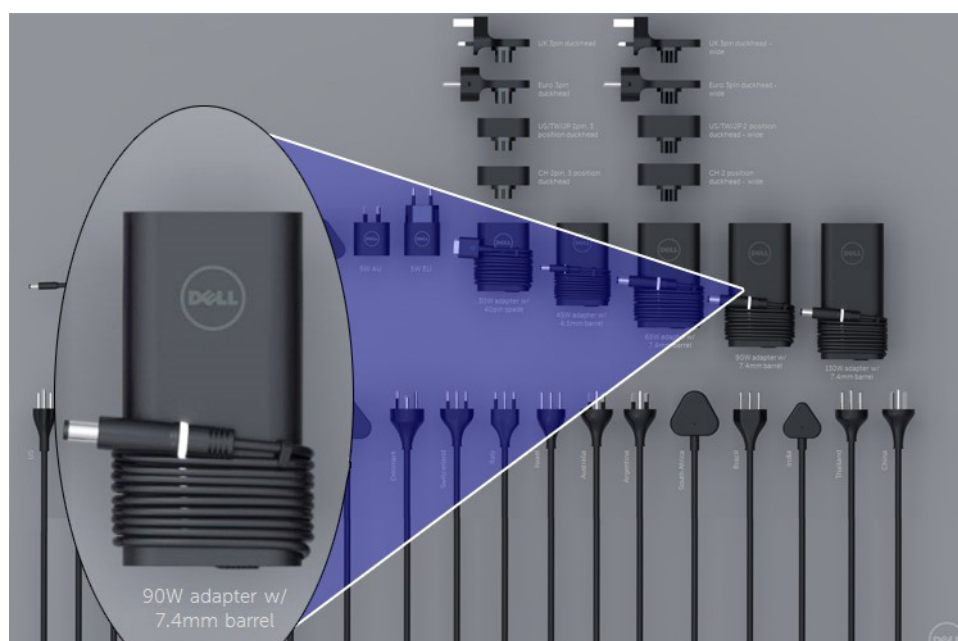


Table 59. Adapter Features

Features	
1	Body shape creates a smooth base for cable wrapping.
2	Cable lock on cord for securing cable wrap.
3	90° strain relief directs the cable out the side of the adapter.
4	Adapter LED is implemented in two spots on opposite sides of the plug head. The LED illumination will be white.

90W



Power

Table 60. Supported power accessories.

• Rugged 51Whr Gen3 Battery Pack • Lind Rugged Battery Charger • Dell Power Companion 18000mAh • Hybrid Adapter + Power Bank • Hybrid Adapter + Power Bank - USB-C and Barrel • Dell USB-C Power Adapter Plus • Dell Power Companion 12000mAh USB-C • Hybrid Adapter + Power Bank - USB-C	
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Monitors

Table 61. Supported monitors

• Dell UltraSharp 32 Monitor - UP3218K • Dell UltraSharp 27 Ultrathin Monitor - U2719D • Dell UltraSharp 25 Monitor - U2518D • Dell 24" Monitor - SP2418H (China Only) • Dell 32 Monitor - SE3218H (China Only) • Dell 24 Touch Monitor - P2418HT • Dell Medical Review 22 Monitor - MR2217 • Dell UltraSharp 38 Monitor - U3818DW • Dell UltraSharp 24 Ultrathin Monitor - U2419H • Dell UltraSharp 27 Monitor - UP2718Q

Audio devices

Table 62. Supported audio devices

• Plantronics Voyager Focus UC B825-M headset for Microsoft Lync • Jabra PRO 935 USB MS Lync Headset • Dell Pro Stereo Headset - UC350 • Dell Performance USB Headset - AE2

Cables, Dongles, and adapters

Table 63. Supported cables, dongles, and adapters

• Dell Adapter - DisplayPort to HDMI 2.0 (4K) • Dell Adapter - DisplayPort to DVI (Single Link) • Dell Adapter - HDMI to DVI • Dell Adapter - USB 3.0 to Ethernet PXE Boot • Dell Adapter - USB-C to DisplayPort • Dell Adapter - USB-C to USB-A 3.0 • Dell Adapter - USB-C to HDMI • Dell Adapter - USB-C to VGA • Dell Legacy Adapter • Dell Adapter - DisplayPort to VGA • Dell Adapter - HDMI to VGA • Dell Adapter - USB-C to Ethernet (PXE Boot)
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Table 63. Supported cables, dongles, and adapters

- Dell Adapter - USB 3.0 to HDMI/VGA/Ethernet/USB 2.0
- Dell Adapter - USB-C to HDMI/VGA/Ethernet/USB 3.0
- Dell Adapter - DisplayPort to DVI (Dual Link)
- Dell Rugged AC Adapter with 90 degree barrel connector
- Dell USB-C Mobile Adapter

Handles

Table 64. Handles

- Hard Handle (Default)
- Soft Handle (Optional)

Carrying case

Table 65. Carrying cases

- Timbuk2 - Premium Hybrid 15/17
- Latitude Rugged Gen 3 NB Soft Handle
- Latitude Rugged Gen 3 NB Semi-Rugged Handle
- Latitude Rugged Gen 3 NB Shoulder Strap

Docks and port replicators

Table 66. Supported docks and port replicator

- Dell Universal Dock
- Dell Dock
- Dell Dock with Monitor Stand
- Dell USB 3.0 Dual Video Docking Station
- Dell USB 3.0 Ultra HD Triple Video Docking Station
- Dell Latitude Rugged Notebook Desk Dock
- Havis - Dell Rugged Vehicle Docks
- Gamber-Johnson / PMT Vehicle Docks

External data storage

Table 67. Supported external data storage

- Promise Pegasus3 PC Edition R4
- Dell Portable Thunderbolt 3 SSD, 500GB
- Dell USB Slim DVD +/- RW Drive - DW316
- Dell 32GB Micro SDHC Card with Adapter
- Dell Portable Thunderbolt 3 SSD, 1TB
- Dell Portable SSD, USB-C 250GB

Docks and Stands

Table 68. Supported docks and stands

- Dell Monitor Stand with USB 3.0 Dock
- Dell Dual Monitor Arm
- Dell Slim Single Monitor Arm

Input devices

Table 69. Supported input devices

- Logitech Wireless Performance Combo MX800 - Keyboard and Mouse Set
- Dell Business Multimedia Keyboard - KB522
- Wired Mouse with Fingerprint Reader
- Dell Wireless Keyboard and Mouse - KM117
- Dell Premier Wireless Keyboard and Mouse - KM717
- Dell KB813 Smartcard Keyboard

Security devices

Table 70. Supported security devices

- Kensington ClickSafe Keyed Laptop Lock
- Dell Privacy Filter - 14"
- Kensington N17 Keyed Laptop Lock for Dell Devices
- Kensington Chassis Lock
- Kensington MicroSaver Keyed Laptop Lock

Hot key definition

Fn behavior: Primary behavior is media key; Secondary behavior is F1-F12 key.

- Fn Lock only switches primary and secondary behavior on F1-F12.
- F7 is stealth –unique for rugged and semi rugged platforms. It turns off LCD, all wireless, all alerts, indicator lights, sound, fan, etc

Table 71. Keyboard shortcuts

Hot keys	Function	Description
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

Table 71. Keyboard shortcuts (continued)

Hot keys	Function	Description
		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+F5	Num lock	Allows the user to toggle between locked and unlocked NumLock
Fn+F6	Scroll lock	Used as Scroll Lock key.
Fn+F7	Stealth Mode	Allows the user to toggle to and from Stealth Mode
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 wireless 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.

Traditional programming functions like Scroll Lock are assigned to alpha keys with un-printed legends.

- **Fn+S** = Scroll Lock
- **Fn+B** = Pause
- **Fn+Ctrl+B** = Break
- **Fn+R** = Sys-Req

 **NOTE:** For non-backlit keyboards F10 has no function and icon on function key is purged.

Out-of-Band Systems Management- Intel vPro and Intel Standard Manageability

Intel vPro and Intel Standard Manageability must be configured in the Dell factory at the time of purchase, as they are NOT field upgradable. They offer out-of-band management and DASH compliance ([link to DASH certification registry](#)).

Intel vPro

Available with Intel Core i5 and i7 processors and offers the most complete set of out-of-band management features including KVM, IPv6 support, graceful shutdown, and all the features from previous versions of vPro. It uses the latest version of Intel's Active Management Technology (AMT).

To learn more about vPro, visit Intel's website at <http://www.intel.com/content/www/us/en/architecture-and-technology/vpro/vpro-technology-general.html>.

A unique and new Dell Remote Provisioning feature for Intel vPro quickly activates vPro capabilities on a PC, reducing vPro set-up time from months to less than an hour. The Dell Remote Provisioning feature for Intel vPro is available as a part of the module: **Dell Command | Integration Suite for Systems Center**

Intel Standard Manageability (ISM)

ISM offers a limited set of out-of-band features like remote power on/off, Serial-over-LAN redirect, Wake-on-LAN, etc.

To learn more about Intel ISM, visit Intel's website at: <https://software.intel.com/en-us/blogs/2009/03/27/what-is-standard-manageability>.

Systems management - From on-premises to the cloud

Dell Client Command Suite - a free toolkit available for download, for all OptiPlex PCs at <http://dell.com/command>, automates and streamlines systems management tasks, saving time, money, and resources. It consists of the following modules that can be used independently, or with a variety of systems management consoles such as SCCM.

Dell Command | Deploy enables easy operating system (OS) deployment across all major OS deployment methodologies and provides numerous system-specific drivers that have been extracted and reduced to an OS-consumable state.

Dell Command | Configure is a graphical user interface (GUI) admin tool for configuring and deploying hardware settings in a pre-OS or post-OS environment, and it operates seamlessly with SCCM and Airwatch and can be self-integrated into LANDesk and KACE. Simply, this is all about the BIOS. Command | Configure allows you to remotely automate and configure over 150+ BIOS settings for a personalized user experience.

Dell Command | PowerShell Provider can do the same things as Command | Configure, but with a different method. PowerShell is a scripting language that allows customers to create a customized and dynamic configuration process.

Dell Command | Monitor is a Windows Management Instrumentation (WMI) agent that provides IT admins with an extensive inventory of the hardware and health-state data. Admins can also configure hardware remotely by using command line and scripting.

Dell Command | Update (end-user tool) is factory-installed and allows admins to individually manage and automatically present and install Dell updates to the BIOS, drivers, and software. Command | Update eliminates the time-consuming hunting and pecking process of update installation.

Dell Command | Update Catalog provides searchable metadata that allows the management console to retrieve the latest system-specific updates (driver, firmware or BIOS). The updates are then delivered seamlessly to end-users using the customer's systems management infrastructure that is consuming the catalog (like SCCM).

Dell Command | Integration Suite for System Center - This suite integrates all the key components of the Client Command Suite into Microsoft System Center Configuration Manager 2012 and Current Branch versions.

Dell Client Command Suite's integration with VMware Workspace ONE Powered by AirWatch, now allows customers to manage their Dell client hardware from the cloud, using a single Workspace ONE console.

Operating system

Table 72. Operating system

Operating System Supported	
	• Windows 10 Professional (64 bit) • Windows Enterprise (64 bit) • Windows 7 via Dell CFI † • Ubuntu 18.04

 **NOTE:** † Supported on Intel Dual-Core i5-6300U SkyLake processor only.

Miscellaneous software

Table 73. Miscellaneous software

Dell Support assist	Standard v3.2
Intel Rapid Storage Technology	Optional
Dell Command Power Manager	Standard v2.1

Getting help

Topics:

- [Contacting Dell](#)

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.