Precision 3450 Small Form Factor

Setup and Specifications

Notes, cautions, and warnings

(i) **NOTE:** A NOTE indicates important information that helps you make better use of your product.
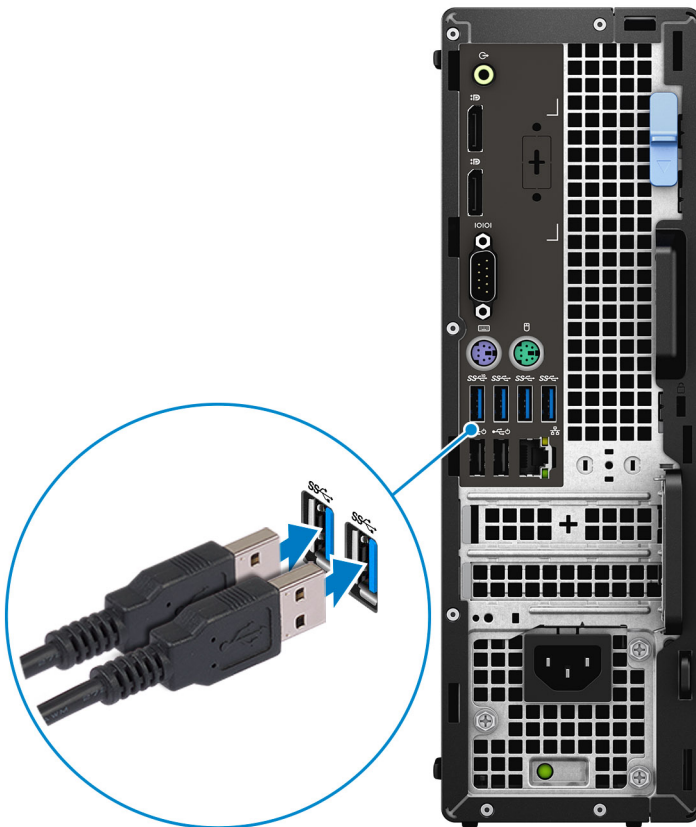
⚠ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**
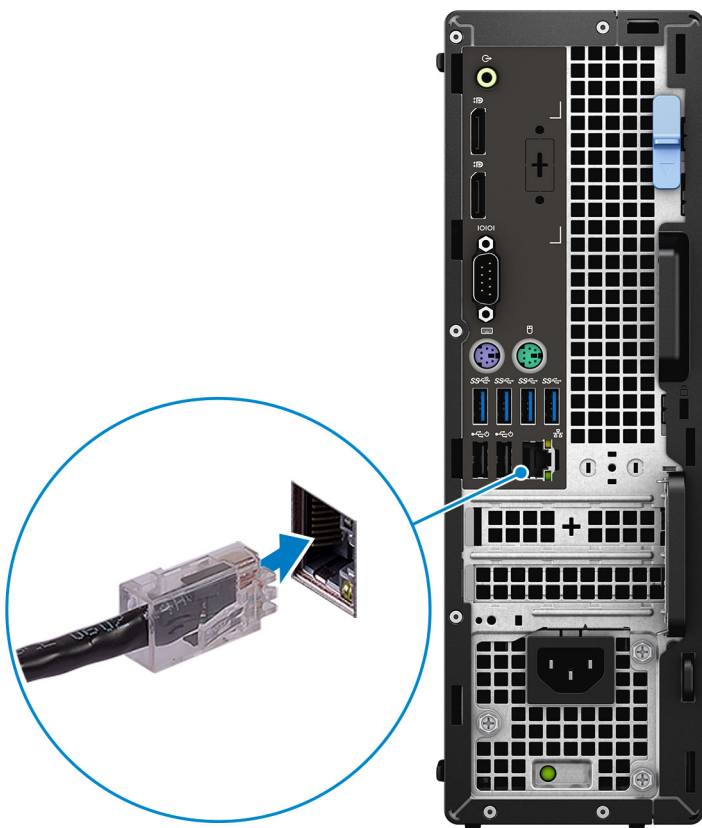
Set up your computer

Steps

1. Connect the keyboard and mouse.

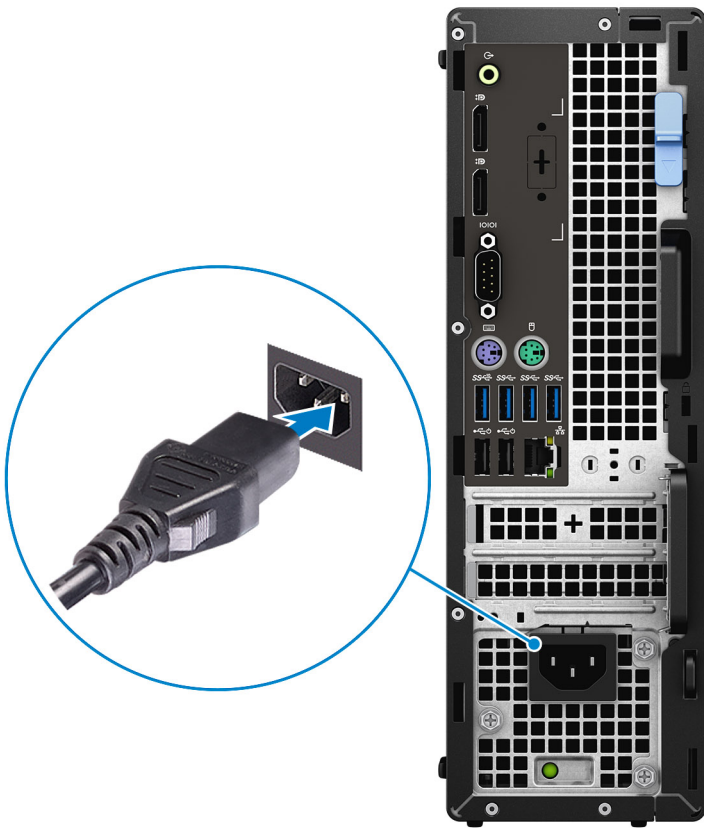2. Connect to your network using a cable, or connect to a wireless network.

3. Connect the display.

(i) **NOTE:** If you ordered your computer with a discrete graphics card, connect the display cable to the discrete graphics card connectors.

4. Connect the power cable.

5. Press the power button.

6. Finish operating system setup.

   For Windows: Follow the on-screen instructions to complete the setup. When setting up, Dell recommends that you:
   - Connect to a network for Windows updates.

     (i) **NOTE:** If connecting to a secured wireless network, enter the password for the wireless network access when prompted.
   - If connected to the internet, sign in with or create a Microsoft account. If not connected to the Internet, create an offline account.
   - On the **Support and Protection** screen, enter your contact details.

   a. Connect to a network.
   b. Sign-in to your Microsoft account or create a new account.
7. Locate and use Dell apps from the Windows Start menu.

   Table 1. Locate Dell apps

	Dell Product Registration Register your computer with Dell.
	Dell Help & Support Access help and support for your computer.
	SupportAssist Proactively checks the health of your computer's hardware and software.

Table 1. Locate Dell apps (continued)

	ⓘ **NOTE:** Renew or upgrade your warranty by clicking the warranty expiry date in SupportAssist.
	Dell Update Updates your computer with critical fixes and important device drivers as they become available.
	Dell Digital Delivery Download software applications including software that is purchased but not preinstalled on your computer.

Views of Precision 3450 Small Form Factor

Front
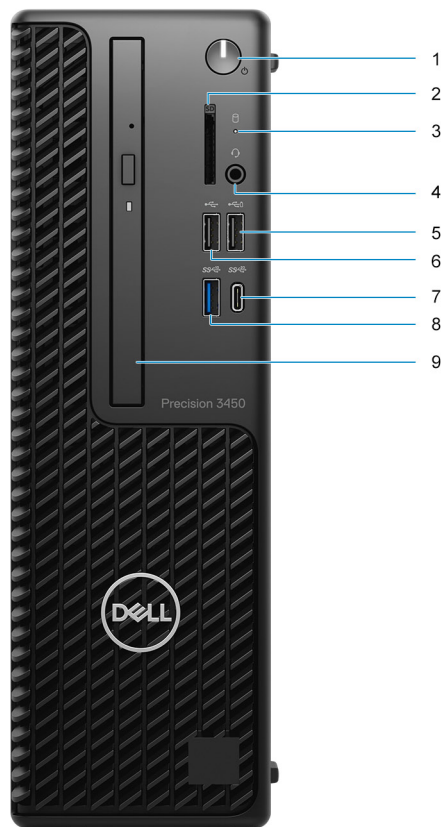
1. Power button and power light
2. SD card reader (Optional)
3. Hard drive activity light
4. Universal audio jack port
5. USB 2.0 port with PowerShare
6. USB 2.0 port
7. USB 3.2 Gen2x2 capable Type-C® port
8. USB 3.2 Gen2 port
9. Optical disk drive (Optional)

Back
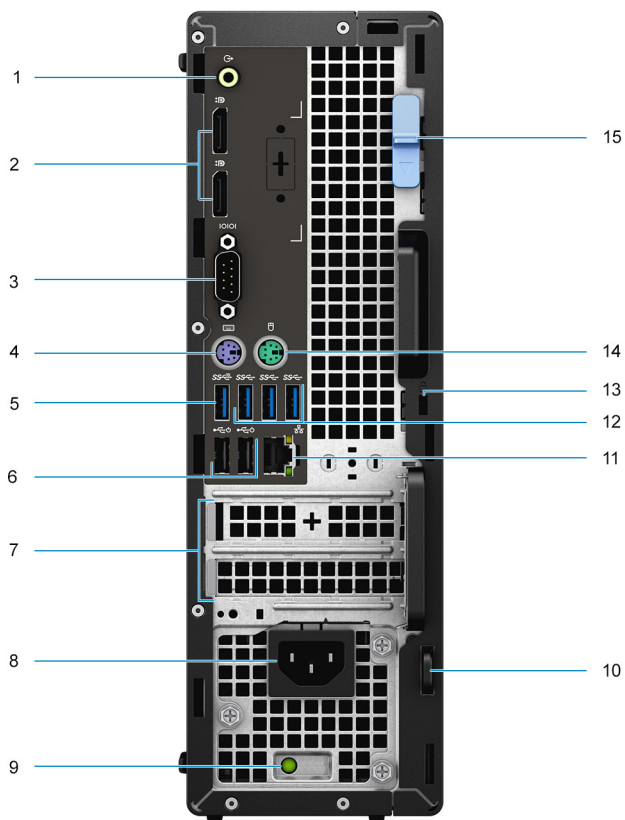
1. Line -in/out retasking
2. Two DisplayPort 1.4 ports
3. Serial Port
4. PS/2 Keyboard port
5. USB 3.2 Gen 2 port
6. Two USB 2.0 ports with Power On
7. Expansion card slots
8. Power connector port
9. Power supply diagnostic light
10. Padlock loop
11. Network port
12. Three USB 3.2 Gen 1 ports
13. Kensington security-cable slot
14. PS/2 Mouse port
15. Release latch

Specifications of Precision 3450 Small Form Factor

Dimensions and weight

Table 2. Dimensions and weight

Description		Values
Height:		
	Front	290 mm (11.42 in.)
	Rear	290 mm (11.42 in.)
Width		92.6 mm (3.65 in.)
Depth		292.8 mm (11.53 in.)
Weight (maximum)		5.956 kg (13.131 lb)
		ⓘ **NOTE:** The weight of your computer depends on the configuration ordered and the manufacturing variability.

Processors

The following table lists the details of the processors supported by your Precision 3450 Small Form Factor

ⓘ **NOTE:** Global Standard Products (GSP) are a subset of Dell's relationship products that are managed for availability and synchronized transitions on a worldwide basis. They ensure the same platform is available for purchase globally. This allows customers to reduce the number of configurations managed on a worldwide basis, thereby reducing their costs. They also enable companies to implement global IT standards by locking in specific product configurations worldwide.

Device Guard (DG) and Credential Guard (CG) are the new security features that are only available on Windows 10 Enterprise today.

Device Guard is a combination of enterprise-related hardware and software security features that, when configured together, will lock a device down so that it can only run trusted applications. If it is not a trusted application, it cannot run.

Credential Guard uses virtualization-based security to isolate secrets (credentials) so that only privileged system software can access them. Unauthorized access to these secrets can lead to credential theft attacks. Credential Guard prevents these attacks by protecting NTLM password hashes and Kerberos Ticket Granting Tickets.

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

Table 3. Processors

Processors	Wattage	Core count	Thread count	Speed	Cache	Integrated graphics	GSP	DG/CG Ready
10th Generation Intel Core i3-10105	65 W	4	8	3.7 GHz to 4.4 GHz	6 MB	Intel UHD Graphics 630	No	Yes
10th Generation Intel Core i5-10505	65 W	6	12	3.1 GHz to 4.5 GHz	12 MB	Intel UHD Graphics 630	No	Yes
10th Generation Intel Core i5-10600	65 W	6	12	3.3 GHz to 4.8 GHz	12 MB	Intel UHD Graphics 630	No	Yes
10th Generation Intel Core i7-10700	65 W	8	16	2.9 GHz to 4.7 GHz	16 MB	Intel UHD Graphics 630	No	Yes
10th Generation Intel Core i9-10900	65 W	10	20	2.9 GHz to 4.7 GHz	20 MB	Intel UHD Graphics 630	No	Yes
11th Generation Intel Core i5-11500	65 W	6	12	2.7 GHz to 4.6 GHz	12 MB	Intel UHD Graphics 750	Yes	Yes
11th Generation Intel Core i5-11600	65 W	6	12	2.8 GHz to 4.8 GHz	12 MB	Intel UHD Graphics 750	Yes	Yes
11th Generation Intel Core i7-11700	65 W	8	16	2.5 GHz to 4.9 GHz	16 MB	Intel UHD Graphics 750	Yes	Yes
11th Generation Intel Core i9-11900	65 W	8	16	2.5 GHz to 5.2 GHz	16 MB	Intel UHD Graphics 750	Yes	Yes
Intel Xeon W-1250	80 W	6	12	3.3 GHz to 4.4 GHz	12 MB	Intel UHD Graphics 630	Yes	Yes
Intel Xeon W-1270	80 W	8	16	3.2 GHz to 4.7 GHz	16 MB	Intel UHD Graphics 630	Yes	Yes
Intel Xeon W-1290	80 W	10	20	3.7 GHz to 4.9 GHz	20 MB	Intel UHD Graphics 630	Yes	Yes
Intel Xeon W-1350	80 W	6	12	3.3 GHz to 5.0 GHz	12 MB	Intel UHD Graphics P750	Yes	Yes

Table 3. Processors (continued)

Processors	Wattage	Core count	Thread count	Speed	Cache	Integrated graphics	GSP	DG/CG Ready
Intel Xeon W-1370	80 W	8	16	2.9 GHz to 5.1 GHz	16 MB	Intel UHD Graphics P750	Yes	Yes
Intel Xeon W-1390	80 W	8	16	2.8 GHz to 5.2 GHz	16 MB	Intel UHD Graphics P750	Yes	Yes

Chipset

Table 4. Chipset

Description	Values
Chipset	Intel W580
Processor	10th Generation Intel Core i3/5/i7/i9/Xeon/11th Generation Intel Core/i5/i7/i9/Xeon
DRAM bus width	Two channels, 128-bit
Flash EPROM	32 MB
PCIe bus	Upto Gen 3
Non-volatile memory	Yes
BIOS Configuration Serial Peripheral Interface (SPI)	256 Mbit (32 MB) located at SPI_FLASH on chipset
Trusted Platform Module (Discrete TPM Enabled)	24 KB located at TPM 2.0 on chipset
Firmware TPM (Discrete TPM Disabled)	By default the Platform Trust Technology feature is visible to the OS
NIC EEPROM	LOM configuration contained within SPI flash ROM instead of LOM e-fuse

Operating system

Your Precision 3450 Small Form Factor supports the following operating systems:

- Windows 10 Home, 64-bit
- Windows 10 Professional, 64-bit
- Windows 10 Pro National Academic, 64-bit
- Ubuntu Linux 20.04 LTS, 64-bit

Memory

The following table lists the memory specifications of your Latitude 5320:

Table 5. Memory specifications

Description	Values
Slots	4 DIMM slots

Table 5. Memory specifications (continued)

Description	Values
Type	DDR4
Speed	2666 MHz for 10th Generation Intel® Core™ i3 processors, 3200 MHz for 11th Generation Intel® Core™ i5/i7/i9/W-1350/W-1370/W1390 processors
Maximum memory	128 GB
Minimum memory	8 GB
Memory size per slot	4 GB, 8 GB, 16 GB, 32 GB
Configurations supported	8 GB, 2 x 4 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors ,3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 8 GB, 1 x 8 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors ,3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 16 GB, 2 x 8 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors ,3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 16 GB, 4 x 4 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors ,3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 32 GB, 2 x 16 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors, 2933 MHz/3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 32 GB, 4 x 8 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors, 2933 MHz/3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 64 GB, 4 x 16 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors, 2933 MHz/3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors 128 GB, 4 x 32 GB, DDR4, 2666 MHz for 10th Generation Intel Core i3 processors, 2933 MHz for 10th Generation Intel Core i5/i7/i9/Xeon W-1250/W-1270/W1290 processors, 2933 MHz/3200 MHz for 11th Generation Intel Core i5/i7/i9/Xeon W-1350/W-1370/W1390 processors (i) **NOTE:** Memory speed varies by different type of DPC (DIMM per Channel) installation

Memory configuration matrix

Table 6. Memory configuration matrix

Configuration	Slot			
	XMM1	**XMM2**	**XMM3**	**XMM4**
4 GB DDR4	4 GB			
8 GB DDR4	4 GB	4 GB		
8 GB DDR4	8 GB			
16 GB DDR4	8 GB	8 GB		
16 GB DDR4	16 GB			
32 GB DDR4	8 GB	8 GB	8 GB	8 GB
32 GB DDR4	16 GB	16 GB		
32 GB DDR4	32 GB			
64 GB DDR4	16 GB	16 GB	16 GB	16 GB
64 GB DDR4	32 GB	32 GB		
64 GB DDR4	64 GB			
128 GB DDR4	32 GB	32 GB	32 GB	32 GB

(i) **NOTE:** Memory speed varies by different type of DPC (DIMM per Channel) installation.

(i) **NOTE:** Systems configured with 128 GB memory will only run at 2933MHz.

(i) **NOTE:** Memory on systems configured with 11th Generation Intel processors will run at 2933 MHz clock speed when in Dual-channel mode.

Table 7. Dual-channel mode

Channel A	Channel B	Memory speed
2 UDIMM	None	2933/3200 MHz
None	2 UDIMM	2933/3200 MHz
2 UDIMM	2 UDIMM	2933/3200 MHz

External ports

The following table lists the external ports of your Precision 3450 Small Form Factor.

Table 8. External ports

Description	Values
Network port	1 RJ-45
USB ports	- One USB 2.0 Type-A port (front) - One USB 2.0 Type-A with PowerShare (front) - One USB 3.2 Gen 2 (front) - One USB 3.2 Gen 2x2 capable Type-C® port (front) - Two USB 2.0 ports with SmartPower On (rear) - Three USB 3.2 Gen 1 ports (rear)

Table 8. External ports (continued)

Description	Values
	• One USB 3.2 Gen 2 port (rear)
Audio port	• One Universal Audio Jack (front) • One Line -in/out retasking (rear)
Video port	• Two DisplayPort 1.4 port (rear) • One VGA port (rear, optional) • One HDMI 2.0 port (rear, optional) • One Type-C w/DP-Alt mode (rear optional)
Legacy port	• One serial port (rear) • Two PS/2 ports (rear)
Media-card reader	One SD-card 4.0 slot
Power-adapter port	AC-in
Security	• One Wedge-shaped lock • One Padlock Loop • One Lockable Port Cover • One Intrusion switch

Internal slots

The following table lists the internal slots of your Precision 3450 Small Form Factor.

Table 9. Internal slots

Description	Values
PCIe Expansion	• One Half-height Gen 3 PCIe x16 slot • One Half-height PCIe x4 slots
SATA	• Two SATA 3.0 slot for 3.5-inch/2.5-inch hard drive • One SATA 2.0 slot for slim optical drive
M.2	• Two M.2 2280 slot for solid-state drive • One M.2 2280/2230 slot for PCIe solid-state drive/Intel Optane • One M.2 2230 slot for WiFi/Bluetooth card ⓘ **NOTE:** To learn more about the features of different types of M.2 cards, see the knowledge base article SLN301626 at www.dell.com/support.

Ethernet

Table 10. Ethernet specifications

Description	Values
Model number	Intel i219-LM
Transfer rate	10/100/1000 Mbps

Wireless module

The following table lists the Wireless Local Area Network (WLAN) modules supported on your Precision 3450 Small Form Factor.

Table 11. Wireless module specifications

Description	Option one	Option two
Model number	Qualcomm QCA61x4a (DW1820)	Intel AX201
Transfer rate	Up to 867 Mbps	Up to 2400 Mbps
Frequency bands supported	2.4 GHz/5 GHz	2.4 GHz/5 GHz
Wireless standards	- WiFi 802.11a/b/g - Wi-Fi 4 (WiFi 802.11n) - Wi-Fi 5 (WiFi 802.11ac)	- Wi-Fi 802.11a/b/g - Wi-Fi 4 (Wi-Fi 802.11n) - Wi-Fi 5 (Wi-Fi 802.11ac) - Wi-Fi 6 (Wi-Fi 802.11ax)
Encryption	64-bit/128-bit WEP - AES-CCMP - TKIP	64-bit/128-bit WEP - AES-CCMP - TKIP
Bluetooth	Bluetooth 5.0	Bluetooth 5.1

GPU—Integrated

The following table lists the specifications of the integrated Graphics Processing Unit (GPU) supported by your Precision 3450 Small Form Factor.

Table 12. GPU—Integrated

Controller	External display support	Memory size	Processor
Intel UHD Graphics 630	Two DisplayPort 1.4	Shared system memory	10th Generation Intel Core i3
Intel UHD Graphics 750	Two DisplayPort 1.4	Shared system memory	11th Generation Intel Core i5/i7/i9
Intel UHD Graphics P750	Two DisplayPort 1.4	Shared system memory	11th Generation Intel Xeon

GPU - Discrete

Table 13. GPU - Discrete

Controller	External display support	Memory size	Memory Type
AMD Radeon 550	Two DisplayPort 1.2	2 GB	GDDR5
AMD Radeon 540	Two DisplayPort 1.2	4 GB	GDDR5
AMD Radeon Pro WX 2100	- One DisplayPort 1.4 - Two Mini DisplayPort 1.4	2 GB	GDDR5
AMD Radeon Pro WX 3200	Four Mini DisplayPort 1.4	4 GB	GDDR5
NVIDIA Quadro P400	Three Mini DisplayPort 1.4	2 GB	GDDR5

Table 13. GPU - Discrete (continued)

Controller	External display support	Memory size	Memory Type
NVIDIA Quadro P630	● Four Mini DisplayPort 1.4	3 GB	GDDR5
NVIDIA Quadro P1000	● Two DP 1.2	4 GB	GDDR5

Audio and Speaker

Table 14. Audio and speaker specifications

Description	Values
Type	4 Channel High Definition Audio
Controller	Realtek ALC3246
Stereo conversion	Supported
Internal interface	High definition audio interface
External interface	Universal Audio Jack
Speakers	2
Internal speaker amplifier	Integrated in ALC3246 (Class-D 2 W)
External volume controls	Keyboard shortcut controls
Speaker output average	2 W
Speaker output peak	2.5 W
Subwoofer output	Not Supported
Microphone	Not Supported

Storage

Your computer supports one of the following configurations:
● One 2.5-inch hard-disk drive
● Two 2.5-inch hard-disk drives
● One 3.5-inch hard-disk drive
● One 2.5-inch hard-disk drive and one 3.5-inch hard-disk drive
● One 2280 solid-state drive (class 40)
● One M.2 2280 solid-state drive (class 40) and one 3.5-inch hard-disk drive
● One M.2 2280 solid-state drive (class 40) and one 2.5-inch hard-disk drive
● One M.2 2280 solid-state drive (class 40) and two 2.5-inch hard-disk drives

Table 15. Storage specifications

Storage type	Interface type	Capacity
2.5 in. hard-disk drive, 5400 RPM	SATA	Upto 2 TB
2.5 in. hard-disk drive, 7200 RPM	SATA	Upto 1 TB

Table 15. Storage specifications (continued)

Storage type	Interface type	Capacity
2.5 in. hard-disk drive, 7200 RPM, FIPS Self Encrypting Opal 2.0	SATA	Upto 500 GB
3.5 in, hard-disk drive, 5400 RPM	SATA	Upto 4 TB
3.5 in, hard-disk drive, 7200 RPM	SATA	Upto 2 TB
M.2 2280 solid-state drive	Gen 3 PCIe x4 NVMe, Class 40	Upto 2 TB
M.2 2280 Opal Self-Encrypting solid-state drive	Gen 3 PCIe x4 NVMe, Class 40	Upto 1 TB

HDD Preloaded bracket table

Media-card reader

Table 16. Media-card reader specifications

Type	SD-card 4.0 (Optional)
Cards supported	- SD card - microSecure Digital (mSD) - microSecure Digital High Capacity (mSDHC) - microSecure Digital Extended Capacity (mSDXC)

Power supply

Table 17. Power supply

Input voltage	100–240 VAC, 50–60 Hz
Wattage	200 W 100V-240V Full range 260 W 100V-240V Full range

Multiple display support matrix

Table 18. Integrated - Multiple display support matrix

Graphics Card	Intel 610	Intel 630	Intel 730	Intel 750
Memory	UMA	UMA	UMA	UMA
Video Ports on Graphics Card	2 x DisplayPorts	2 x DisplayPorts	2 x DisplayPorts	2 x DisplayPorts
Max Displays (direct connect)	2	2	2	2
Max Displays (DP multi-stream)	1	1	1	1
Number of displays	3	3	3	3

Table 18. Integrated - Multiple display support matrix (continued)

Graphics Card	Intel 610	Intel 630	Intel 730	Intel 750
Supported Resolution	DP: 4096 x 2304 @60 Hz, 24 bpp	DP: 4096 x 2304 @60 Hz, 24 bpp	DP: 4096 x 2304 @60 Hz, 24 bpp	DP: 4096 x 2304 @60 Hz, 24 bpp
Total Power	65 W	65 W	65 W	65 W

Table 19. Integrated - Multiple display support matrix

Graphics Card	Intel 630	Intel 730	Intel 750
Memory	UMA	UMA	UMA
Video Ports on Graphics Card	2 x DisplayPorts	2 x DisplayPorts	2 x DisplayPorts
Max Displays (direct connect)	2	2	2
Max Displays (DP multi-stream)	1	1	1
Number of displays	3	3	3
Supported Resolution	DP: 4096 x 2304 @60 Hz, 24 bpp	DP: 4096 x 2304 @60 Hz, 24 bpp	DP: 4096 x 2304 @60 Hz, 24 bpp
Total Power	65 W	65 W	65 W

Table 20. Discrete - Multiple display support matrix

Graphics Card	Radeon RX 640	Radeon RX 550	Radeon RX 540
Memory	4 GB GDDR5	4 GB GDDR5	4 GB GDDR5
Video Ports on Graphics Card	● 2 x Mini DisplayPorts ● 1 x DisplayPort	● 2 x Mini DisplayPorts ● 1 x DisplayPort	● 1 x HDMI 1.4 port ● 1 x DisplayPort
Max Displays (direct connect)	3	3	3
Max Displays (DP multi-stream)	1	1	1
Number of displays	3	3	2
Supported Resolution	● 3 x FHD (1920 x 1080)	● 3 x FHD (1920 x 1080)	● 2 x FHD (1920 x 1080)
Total Power	50 W	50 W	50 W

Security Software

Table 21. Security Software

Features	Description
Dell Endpoint Security Suite Enterprise	Optional
Dell Data Guardian	Optional
Dell Encryption (Enterprise or Personal)	Optional
Dell Threat Defense	Optional

Table 21. Security Software (continued)

Features	Description
RSA SecurID Access	Optional
RSA NetWitness Endpoint	Optional
MozyPro or MozyEnterprise	Optional
VMware Airwatch/WorkspaceONE	Optional
Absolute Data & Device Security	Optional

Add-in cards

Table 22. Add-in cards

Add-in cards
USB 3.1 Gen 2 Type-C PCIe card
USB 3.1 Gen 2 PCIe card
Serial and parallel port PCIe card
Intel Gigabit NIC PCIe card
Aquantia AQtion AQN-108 5/2.5 GbE NIC adapter

CAC/PIV Module

Table 23. CAC/PIV Module

Features	Tower/Small Form Factor/Micro
Connector Type	ISO 7816 compliant contact smart card NFC forum 2.0
PCB	
Dimensions (W x L x T)	74.5 mm x 45.7 mm
Layer	6
Controller Details	
Controller bus architecture (example PCIe 1.0a x1)	USB 2.0
Data transfer mode (example Bus-Master DMA)	USB 2.0
Power consumption (full operation per data rate connection speed)	288.08 mA x 3.3 V
Power consumption (standby operation)	8.9 mA x 3.3 V
Standard compliance (example 802.1P)	NFC Forum 2.0, ISO7816
Hardware Certifications (example FCC, B, GS mark…)	FIPS201, FIPS140-2
Boot ROM Support	Integrated inside Lynx SoC

Table 23. CAC/PIV Module (continued)

Features	Tower/Small Form Factor/Micro
Processor/Chipset	
NFC	Broadcom Cortex-M3 BC58102
Card reader driver	NXP TDA8034HN/C2
USB 2.0 Hub	GENESYS GL850G-OHY50
PROM	WINBOND W25Q32JVSSIQ 32M/bit
Power IC	RICHTEK RT5796AHGJ5
Power LDO (NFC VBAT)	GMT G9141T11U
Environmental	
Operating System Driver Support	Dell ControlVault2 Driver
Manageability (examples WOL, PXE)	No, this is not a LAN controller chipset.
Management Capabilities Alerting (example ASF 2.0)	No, this is not a LAN controller chipset.
Add-in Slots	
Card reader connector	1 (10 PIN)
USB 2.0 header	1 (5 PIN)
NFC header	1 (6 PIN)

Environmental

Table 24. Environmental specifications

Feature	Precision 3450 Small Form Factor
Recyclable packaging	Yes
BFR/PVC—free chassis	No
MultiPack packaging	Yes (US only) (optional)
Energy-Efficient Power Supply	Standard
ENV0424 compliant	Yes

(i) **NOTE:** Wood-based fiber packaging contains a minimum of 35% recycled content by total weight of wood-based fiber. Packaging that contains without wood-based fiber can be claimed as Not Applicable.

Energy Star, EPEAT and Trusted Platform Module (TPM)

Table 25. Energy Star, EPEAT and TPM

Features	Specifications
Energy Star 8.0	Compliant configurations available
EPEAT	Gold and Silver compliant configurations available
Trusted Platform Module (TPM) 2.0[1,2]	Integrated on system board
Firmware-TPM (Discrete TPM disabled)	Optional

(i) **NOTE:**

[1]TPM 2.0 is FIPS 140-2 certified.

[2]TPM is not available in all countries.

Out of Band Systems Management Intel Standard Manageability

Intel Standard Manageability (ISM) must be configured in our factory at the time of purchase, as it is NOT field upgradable. ISM offers out-of-band management and DASH compliance https://registry.dmtf.org/registry/results/field_initiative_name%3A%22DASH%201.0%22. ISM offers a limited set of out-of-band features like remote power on/off, Serial-over-LAN redirect, Wake-on-LAN, etc. ISM leverages the same capabilities that were available with Intel's Active Management Technology (AMT) version 5.0.

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

Computer environment

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

Table 26. Computer environment

Description	Operating	Storage
Temperature range	10°C–35°C (50°F–95°F)	-40°C-65°C (-40°F-149°F)
Relative humidity (maximum)	20% to 85% (non-condensing)	5% to 95% (non-condensing)
Vibration (maximum)*	0.52 GRMS random at 5 Hz to 350 Hz	2.0 GRMS random at 5 Hz to 350 Hz
Shock (maximum)	Bottom half-sine pulse with a change in velocity of 50.8 cm/sec (20 in./sec)	105G half-sine pulse with a change in velocity of 133 cm/sec (52.5 in./sec)
Altitude (maximum)	3048 m (10,000 ft)	10,668 m (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.

Service and support

ⓘ **NOTE:** For more details on Dell Service Plans, see https://www.dell.com/learn/us/19/services/warranty-support-services.

Table 27. Warranty

Warranty
1 Year Basic Warranty with Hardware Service on site service after remote diagnosis
2 Years Basic Warranty Extension
3 Years Basic Warranty Extension
4 Years Basic Warranty Extension
5 Years Basic Warranty Extension
1 Year ProSupport and Next Business Day on-site service
2 Years ProSupport and Next Business Day on-site service
3 Years ProSupport and Next Business Day on-site service
4 Years ProSupport and Next Business Day on-site service
5 Years ProSupport and Next Business Day on-site service
1 Year ProSupport Plus for Client with Next Business Day on-site service
2 Years ProSupport Plus for Client with Next Business Day on-site service
3 Years ProSupport Plus for Client with Next Business Day on-site service
4 Years ProSupport Plus for Client with Next Business Day on-site service
5 Years ProSupport Plus for Client with Next Business Day on-site service

Table 28. Accidental damage services

Accidental Damage Services
1 Year Accidental Damage Service
2 Years Accidental Damage Service
3 Years Accidental Damage Service
4 Years Accidental Damage Service
5 Years Accidental Damage Service

Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 29. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	https://www.dell.com/
Dell Support	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	● Windows: https://www.dell.com/support/windows ● Linux: https://www.dell.com/support/linux
Troubleshooting information, user manuals, set up instructions, product specifications, technical help blogs, drivers, software updates, and so on.	https://www.dell.com/support/home/
Dell knowledge base articles for various of system concerns:	1. Go to https://www.dell.com/support/home/?app=knowledgebase. 2. Type the subject or keyword in the **Search** box. 3. Click **Search** to retrieve the related articles.
Learn and get more information about your product: ● Product specifications ● Operating system ● Setting up and using your product ● Data backup ● Troubleshooting and diagnostics ● Factory and system restore ● BIOS information	Dell provides several online and telephone-based support and service options. If you do not have an active Internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog. ● Select **Detect Product**. ● Locate your product through the drop-down menu under **View Products**. ● Enter the **Service Tag number** or **Product ID** in the search bar. ● Once on product support page, scroll down to Manuals and Documents section to preview all the Manuals, documents, and other information for your product.

Contacting Dell

Dell provides several online and telephone-based support and service options. If you do not have an active Internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country/region 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 https://www.dell.com/support/.
2. Select your country/region from the drop-down menu on the lower right corner of the page.
3. For **customized support:**
   a. Enter your system Service Tag in the **Enter your Service Tag** field.
   b. Click **submit**.
      ● The support page that lists the various support categories is displayed.
4. For **general support:**
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
      ● The support page that lists the various support categories is displayed.
5. For contact details of Dell Global Technical Support, see https://www.dell.com/contactdell.

   ⓘ **NOTE:** The Contact Technical Support page is displayed with details to call, chat, or email the Dell Global Technical Support team.

ⓘ **NOTE:** Availability varies by country/region and product, and some services may not be available in your area.