

OptiPlex 5040 - Mini Tower

Owner's Manual



Notes, cautions, and warnings

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

 | **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.

Copyright © 2015 Dell Inc. All rights reserved. This product is protected by U.S. and international copyright and intellectual property laws. Dell™ and the Dell logo are trademarks of Dell Inc. in the United States and/or other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.

1 Working on your computer.....	5
Before working inside your computer.....	5
Turning off your computer.....	5
After working inside your computer.....	6
2 Removing and installing components.....	7
Recommended tools.....	7
Removing the cover.....	7
Installing the cover.....	7
Removing the bezel.....	7
Installing the bezel.....	8
Opening the front bezel door.....	8
Removing the hard drive assembly.....	9
Removing the hard drive from the hard drive bracket.....	9
Installing the hard drive into the hard drive bracket.....	10
Installing the hard drive assembly.....	10
Removing the optical drive.....	10
Installing the optical drive.....	11
Removing the optical drive (3.5-inch).....	11
Installing the optical drive (3.5-inch).....	11
Installing the optional SSD card.....	11
Removing the optional SSD card.....	13
Removing the SD card reader.....	13
Installing the SD card reader.....	13
Removing the memory module.....	14
Installing the memory module.....	14
Removing the PCIe expansion card.....	14
Installing the PCIe expansion card.....	15
Removing the optional Ethernet port card.....	15
Installing the optional Ethernet port card.....	16
Removing the power supply unit (PSU).....	16
Installing the power supply unit (PSU).....	17
Removing the VGA daughter board.....	17
Installing the VGA daughter board.....	18
Removing the intrusion switch.....	18
Installing the intrusion switch.....	19
Removing the power switch.....	19
Installing the power switch.....	20
Removing the speaker.....	20
Installing the speaker.....	20
Removing the coin cell battery.....	21
Installing the coin cell battery.....	21
Removing the heat sink assembly.....	21

Installing the heat sink assembly.....	22
Removing the processor.....	22
Installing the processor.....	23
Removing the system fan.....	23
Installing the system fan.....	23
Removing the system board.....	24
Installing the system board.....	24
3 Troubleshooting your computer.....	26
Diagnostic and Power LED codes.....	26
Diagnostic error messages.....	30
System error messages.....	33
4 System Setup.....	35
Boot Sequence.....	35
Navigation keys.....	35
System Setup overview.....	36
Accessing System Setup.....	36
Updating the BIOS	36
System and setup password.....	37
Assigning a system password and setup password.....	37
Deleting or changing an existing system and/or setup password.....	38
5 Specifications.....	39
6 Contacting Dell.....	44

Working on your computer

Before working inside your computer

Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or--if purchased separately--installed by performing the removal procedure in reverse order.

⚠ WARNING: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.Dell.com/regulatory_compliance

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

⚠ CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.

⚠ CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

⚠ CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

ⓘ NOTE: The color of your computer and certain components may appear differently than shown in this document.

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

- 1 Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
- 2 Turn off your computer (see *Turning off your computer*).

⚠ CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

- 3 Disconnect all network cables from the computer.
- 4 Disconnect your computer and all attached devices from their electrical outlets.
- 5 Press and hold the power button while the computer is unplugged to ground the system board.
- 6 Remove the cover.

⚠ CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

Turning off your computer

⚠ CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

- 1 Turning off your computer:

- In Windows 10 (using a touch enabled device or mouse):
 - 1 Click or tap .
 - 2 Click or tap  and then click or touch **Shut down**.
 - In Windows 8 (using a touch enabled device):
 - 1 Swipe in from the right edge of the screen, opening the **Charms** menu and select **Settings**.
 - 2 Tap  and then tap **Shut down**.
 - In Windows 8 (using a mouse):
 - 1 Point to upper-right corner of the screen and click **Settings**.
 - 2 Click  and then click **Shut down**.
 - In Windows 7:
 - 1 Click **Start**.
 - 2 Click **Shut Down**.
- 2 Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

After working inside your computer

After you complete any replacement procedure, ensure that you connect any external devices, cards, and cables before turning on your computer.

- 1 Replace the cover.

 **CAUTION:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

- 2 Connect any telephone or network cables to your computer.
- 3 Connect your computer and all attached devices to their electrical outlets.
- 4 Turn on your computer.
- 5 If required, verify that the computer works correctly by running **Dell Diagnostics**.

Removing and installing components

This section provides detailed information on how to remove or install the components from your computer.

Recommended tools

The procedures in this document require the following tools:

- Small flat blade screwdriver
- Phillips screwdriver
- Small plastic scribe

Removing the cover

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 To remove the cover:
 - a Slide the blue tab to release the cover from the computer [1].
 - b Slide the cover toward the back of the computer and lift it away from the computer [2].



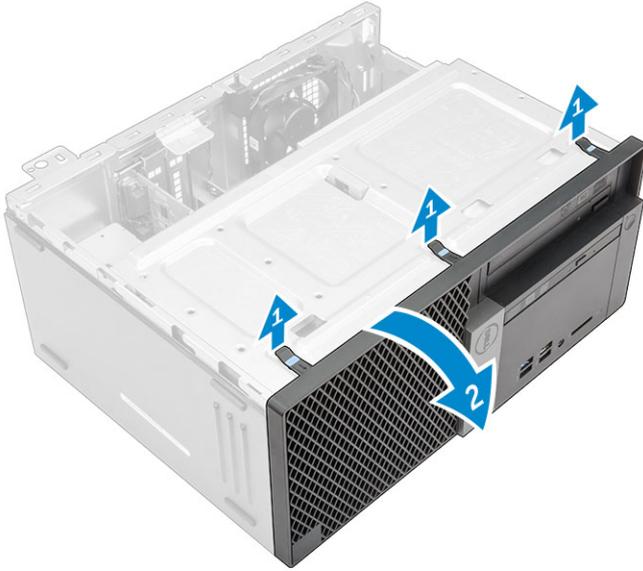
Installing the cover

- 1 Place the cover on the computer and slide the cover forward until it clicks into place.
- 2 Follow the procedure in [After Working Inside Your Computer](#).

Removing the bezel

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the [cover](#).
- 3 To remove the front bezel:

- a Lift the tabs to release the front bezel from the computer.
- b Remove the front bezel from the computer.



Installing the bezel

- 1 Insert the tabs on the bezel into the slots on the computer.
- 2 Press the bezel until the tabs clicks into place.
- 3 Install the [cover](#).
- 4 Follow the procedure in [After Working Inside Your Computer](#).

Opening the front bezel door

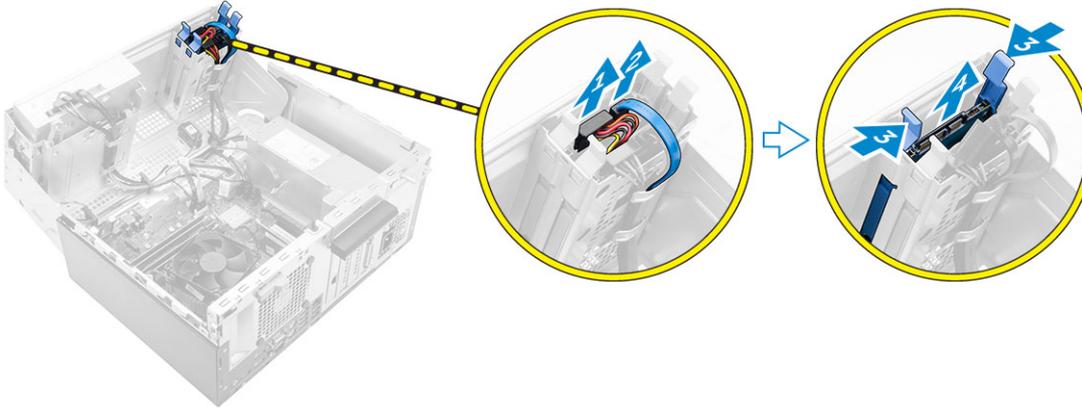
- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Pull the front bezel door to open it.



CAUTION: The front bezel door opens only to a limited extent. See the printed label for the maximum permissible level.

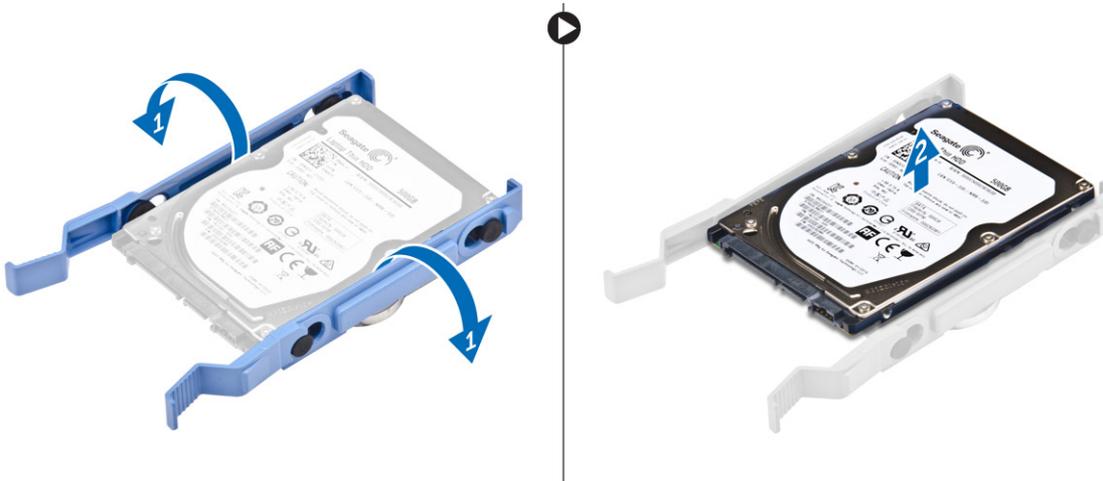
Removing the hard drive assembly

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - cover
 - bezel
- 3 Open the [front bezel door](#).
- 4 To remove the hard drive assembly:
 - a Disconnect the hard drive assembly cables from the connectors on the hard drive [1, 2].
 - b Press the blue tabs on both sides [3] and pull the hard drive assembly out of the computer [4].



Removing the hard drive from the hard drive bracket

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - a cover
 - b bezel
 - c hard drive assembly
- 3 To remove the hard drive bracket:
 - a Pull one side of the hard drive bracket to disengage the pins on the bracket from the slots on the hard drive [1].
 - b Lift the hard drive out of the hard drive bracket [2].



Installing the hard drive into the hard drive bracket

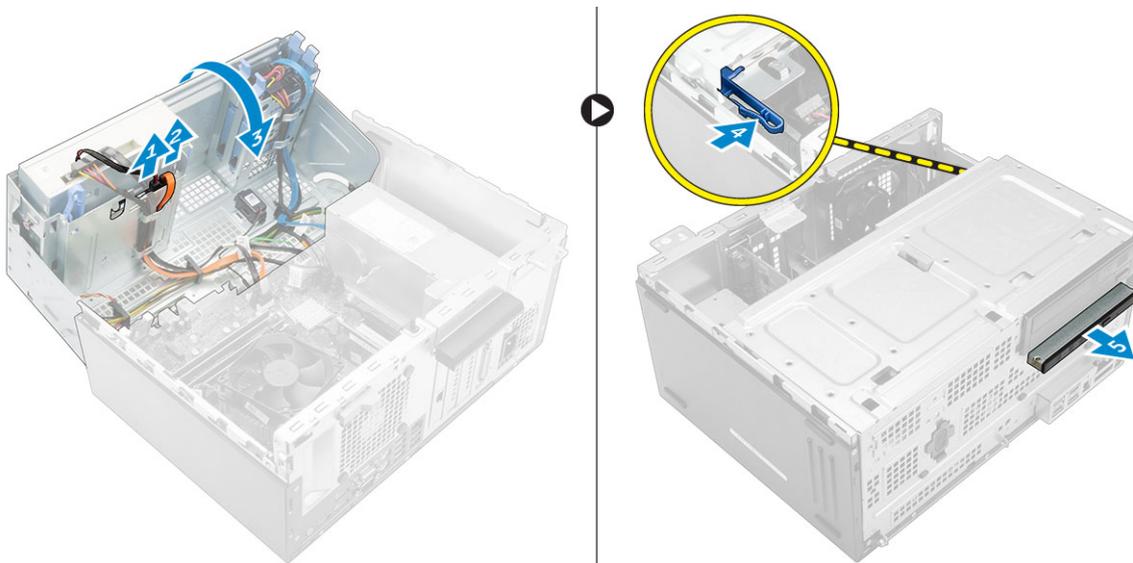
- 1 Align and insert the pins on the hard drive bracket with the slots on one side of the hard drive.
- 2 Flex the other side of the hard drive bracket, and align and insert the pins on the bracket into the hard drive.
- 3 Install the:
 - a [hard drive assembly](#)
 - b [bezel](#)
 - c [cover](#)
- 4 Follow the procedure in [After Working Inside Your Computer](#).

Installing the hard drive assembly

- 1 Insert the hard drive assembly into the slot on the computer until it clicks into place.
- 2 Close the front bezel door.
- 3 Connect the SATA cable and the power cable to the connectors on the hard drive.
- 4 Install the:
 - [bezel](#)
 - [cover](#)
- 5 Follow the procedure in [After Working Inside Your Computer](#).

Removing the optical drive

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 To remove the optical drive:
 - a Open the [front bezel door](#).
 - b Disconnect the data cable and power cable from the connectors on the optical drive [1, 2].
 - c Close the front bezel door [3].
 - d Press the blue release tab [4] and slide the optical drive out of the computer [5].

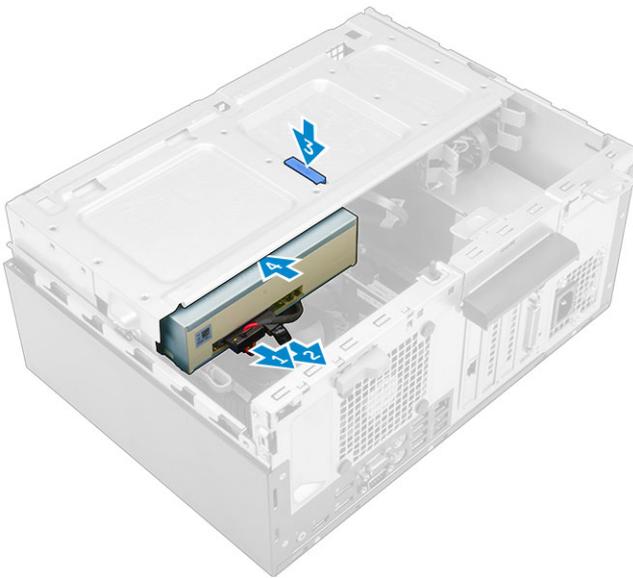


Installing the optical drive

- 1 Insert the optical drive into the optical drive bay until it clicks into place.
- 2 Open the [front bezel door](#).
- 3 Connect the data cable and power cable to the connectors on the optical drive.
- 4 Close the front bezel door.
- 5 Install the:
 - [bezel](#)
 - [cover](#)
- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the optical drive (3.5-inch)

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 To remove the optical drive:
 - a Disconnect the data cable and power cable from the connectors on the optical drive [1, 2].
 - b Press the blue release tab [3] and slide the optical drive out of the optical drive bay [4].



Installing the optical drive (3.5-inch)

- 1 Insert the optical drive into the optical drive bay until it clicks into place.
- 2 Connect the data cable and power cable to the connectors on the optical drive.
- 3 Install the:
 - [bezel](#)
 - [cover](#)
- 4 Follow the procedure in [After Working Inside Your Computer](#).

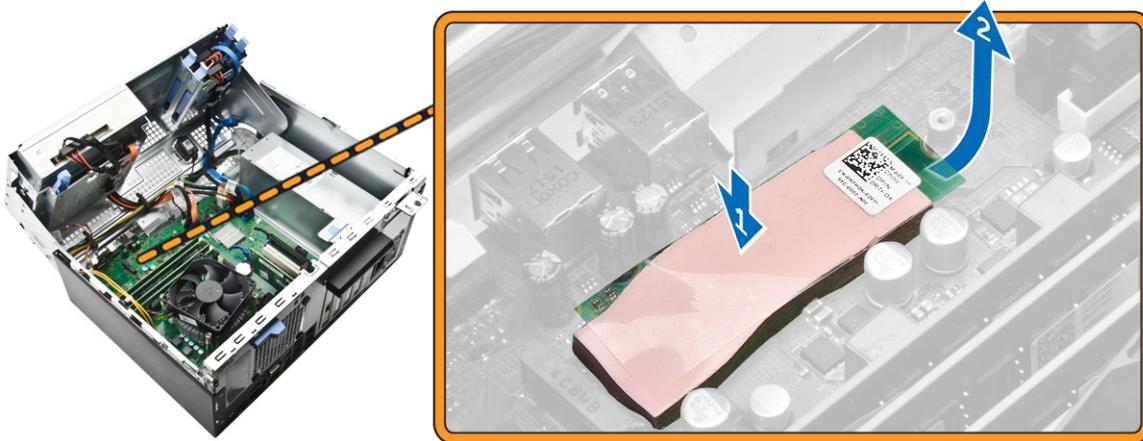
Installing the optional SSD card

- 1 Remove the:

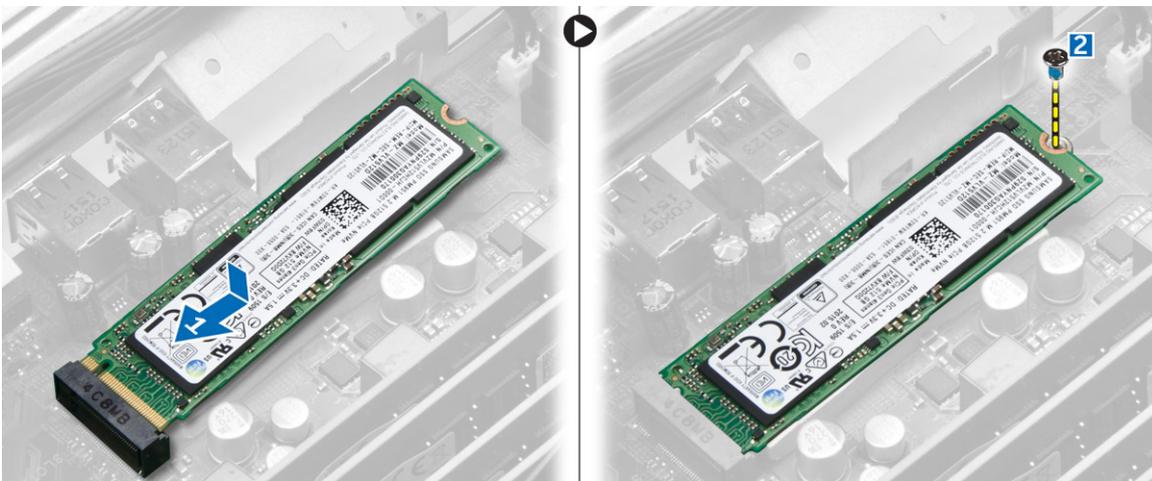
- cover
 - bezel
- 2 Open the **front bezel door**.
 - 3 Peel the adhesive tape (blue) from the rubber.



- 4 Place the rubber on the system board [1] and peel the adhesive tape (pink) from the rubber [2].



- 5 To install the SSD card:
 - a Connect the SSD card to the connector on the system board [1].
 - b Tighten the screw to secure the SSD card to the system board [2].



- 6 Close the front bezel door.

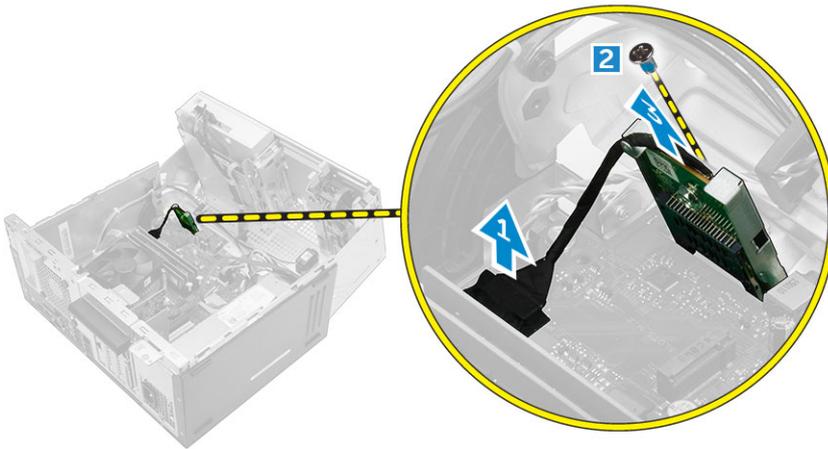
- 7 Install the:
 - a [bezel](#)
 - b [cover](#)
- 8 Follow the procedure in [After Working Inside Your Computer](#).

Removing the optional SSD card

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 Remove the screw that secures the SSD card to the system board.
- 5 Disconnect the SSD card from the connector on the system board.
- 6 Remove the rubber from the system board.

Removing the SD card reader

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the SD card reader:
 - a Disconnect the SD card reader cable from the connector on the system board [1].
 - b Remove the screw that secures the SD card reader to the computer [2].
 - c Lift the SD card reader out of the computer [3].



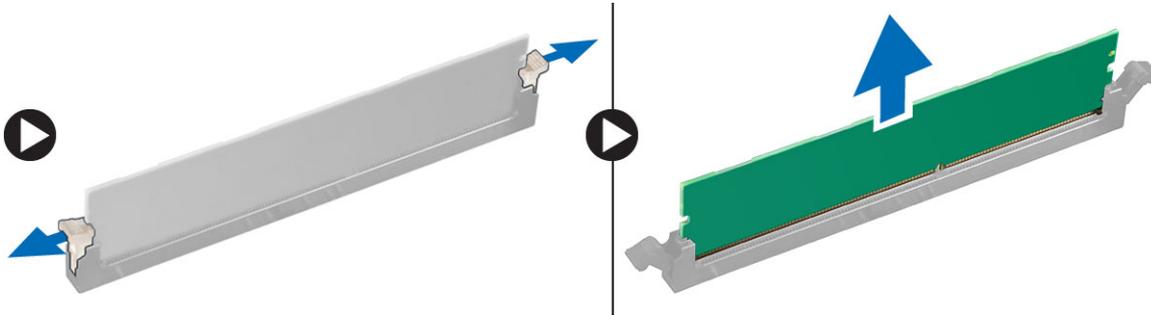
Installing the SD card reader

- 1 Insert the SD card reader into the slot on the system board.
- 2 Tighten the screw to secure the SD card reader to the system board
- 3 Connect the SD card reader cable to the connector on the system board.
- 4 Close the front bezel door.
- 5 Install the:
 - a [bezel](#)
 - b [cover](#)

- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the memory module

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the memory module:
 - a Press the memory module retention tabs on both sides of the memory module.
 - b Lift the memory module from the memory module connector on the system board.

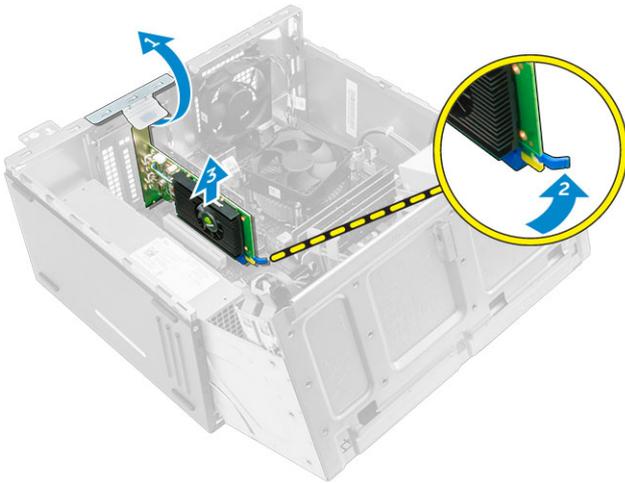


Installing the memory module

- 1 Align the notch on the memory module with the tab on the memory module connector.
- 2 Insert the memory module into the memory module socket.
- 3 Press the memory module until the memory module retention tabs click into place.
- 4 Close the front bezel door.
- 5 Install the:
 - a [cover](#)
 - b [bezel](#)
- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the PCIe expansion card

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the PCIe expansion card:
 - a Pull the release latch to unlock the PCIe expansion card [1].
 - b Push the release tab [2] and lift the PCIe expansion card out of the computer [3].



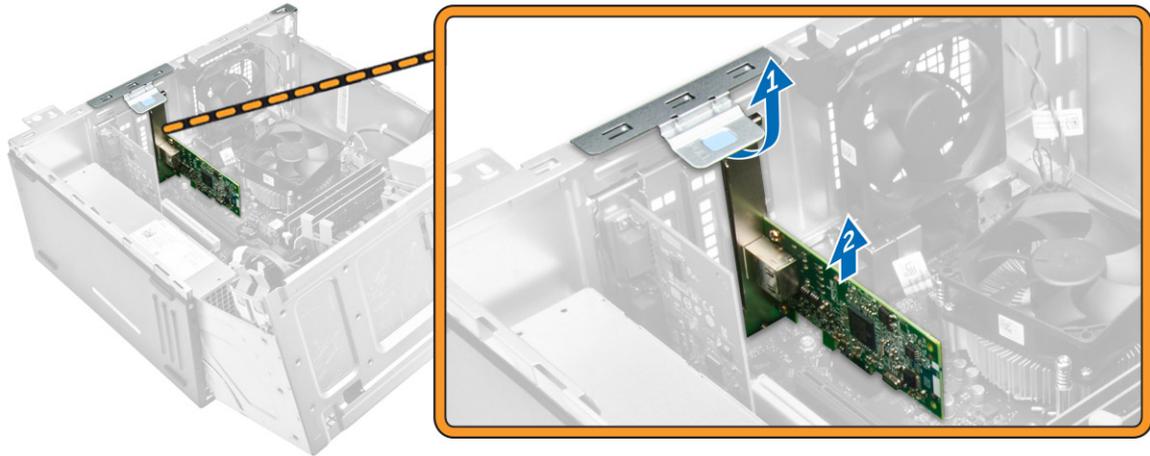
- 5 Repeat the steps to remove any additional PCIe expansion card.

Installing the PCIe expansion card

- 1 Pull the release latch to open it.
- 2 Insert the PCIe expansion card to the connector on the system board.
- 3 Secure the PCIe expansion card by pushing the card retention latch until it clicks into place.
- 4 Repeat the steps to install any additional PCIe expansion card.
- 5 Close the release latch.
- 6 Close the front bezel door.
- 7 Install the:
 - a [bezel](#)
 - b [cover](#)
- 8 Follow the procedure in [After Working Inside Your Computer](#).

Removing the optional Ethernet port card

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the Ethernet port card:
 - a Pull the release latch to open it [1].
 - b Hold the Ethernet port card and pull it to disengage it from the slot on the system board.
 - c Lift the Ethernet port card from the computer [2].

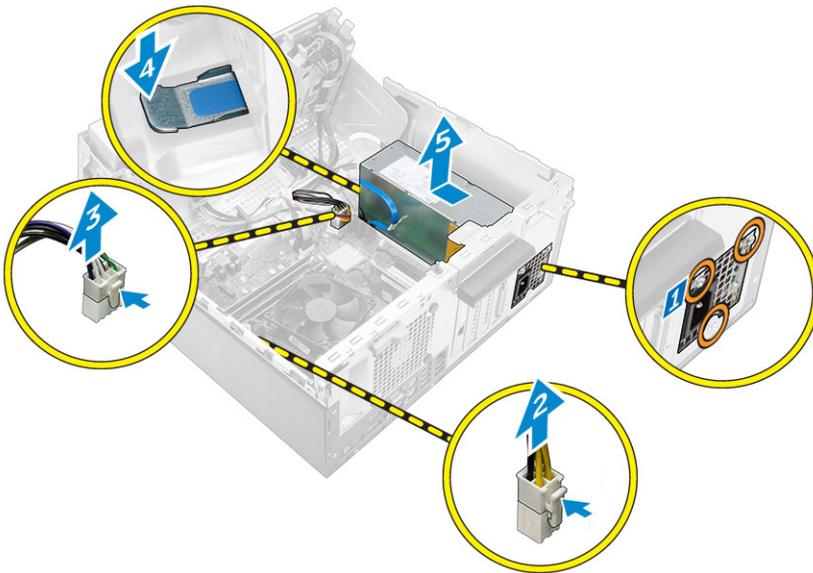


Installing the optional Ethernet port card

- 1 Pull the release latch to open it.
- 2 Align the Ethernet port card with the slot on the back on the computer and the card connector with the connector on the system board.
- 3 Insert the Ethernet port card into the connector on the system board until it clicks into place.
- 4 Close the release latch.
- 5 Install the:
 - a [bezel](#)
 - b [cover](#)
- 6 Close the front bezel door.
- 7 Follow the procedure in [After Working Inside Your Computer](#).

Removing the power supply unit (PSU)

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the PSU:
 - a Remove the screws that secure the PSU to the computer [1].
 - b Disconnect the PSU cables from the connectors on the system board [2, 3].
 - c Unroute the PSU cables from the retention clips.
 - d Press the metal release tab [4], slide the PSU toward the back and lift it out of the computer [5].

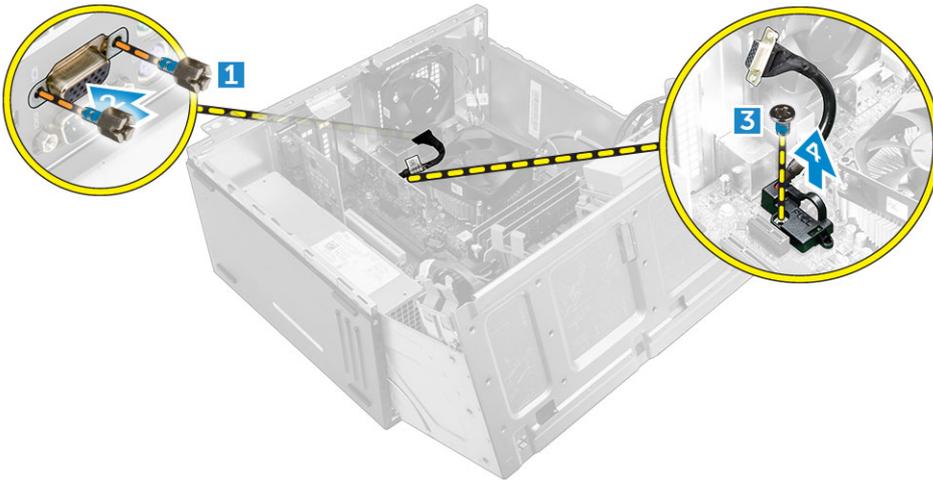


Installing the power supply unit (PSU)

- 1 Insert the PSU into the PSU slot and slide it toward the back of the computer until it clicks into place.
- 2 Tighten the screws to secure the PSU to the computer.
- 3 Route the PSU cables through the retention clips.
- 4 Connect the PSU cables to the connectors on the system board.
- 5 Close the front bezel door.
- 6 Install the:
 - [bezel](#)
 - [cover](#)
- 7 Follow the procedure in [After Working Inside Your Computer](#).

Removing the VGA daughter board

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#)
- 4 To remove the VGA daughter board:
 - a Remove the screws that secure the VGA connector to the computer [1].
 - b Slide the VGA connector to release it from the computer [2].
 - c Remove the screw that secures the VGA daughter board to the computer [3].
 - d Lift the VGA daughter board using the handle to remove it from the computer [4].

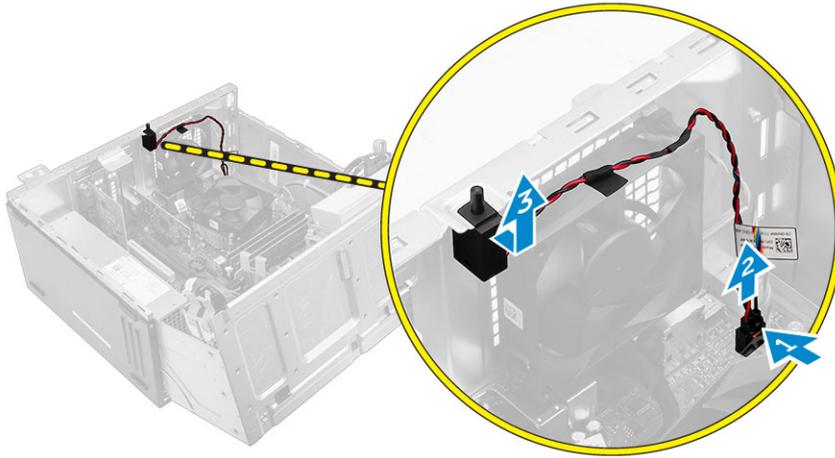


Installing the VGA daughter board

- 1 Align the VGA daughter board with the screw holder on the system board.
- 2 Tighten the screw to secure the VGA daughter board to the system board.
- 3 Insert the VGA connector into the slot at the back of the computer.
- 4 Tighten the screws to secure the VGA connector to the computer.
- 5 Close the front bezel door.
- 6 Install the:
 - [bezel](#)
 - [cover](#)
- 7 Follow the procedure in [After Working Inside Your Computer](#).

Removing the intrusion switch

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the intrusion switch:
 - a Disconnect the intrusion switch cable from the connector on the system board [1].
 - b Unroute the intrusion switch cable from the fan grommet [2].
 - c Slide the intrusion switch and lift it away from the computer [3].

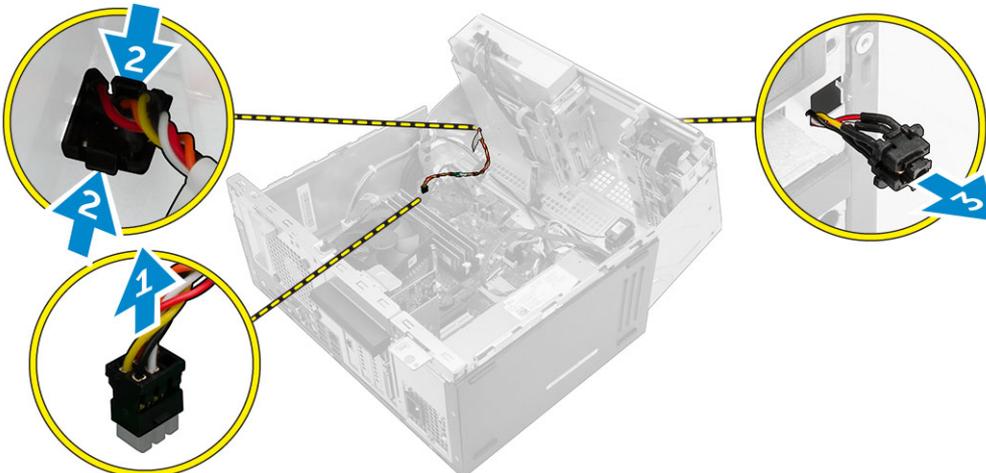


Installing the intrusion switch

- 1 Insert the intrusion switch into the slot on the computer.
- 2 Route the intrusion switch cable through the fan grommet.
- 3 Connect the intrusion switch cable to the connector on the system board.
- 4 Close the front bezel door.
- 5 Install the:
 - [bezel](#)
 - [cover](#)
- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the power switch

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the power switch:
 - a Disconnect the power switch cable from the system board [1].
 - b Unroute the power switch cable from the retention clip.
 - c Press the release tab [2] and slide the power switch out of the computer [3].

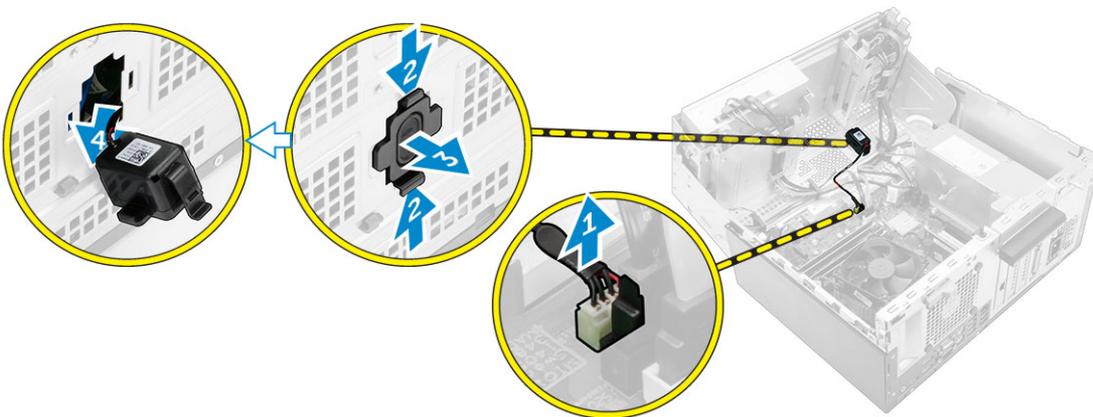


Installing the power switch

- 1 Insert the power switch into the slot and press it until it clicks into place.
- 2 Route the power switch cable through the cable retention clip.
- 3 Connect the power switch cable to the connector on the system board.
- 4 Close the front bezel door.
- 5 Install the:
 - [bezel](#)
 - [cover](#)
- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the speaker

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the speaker:
 - a Disconnect the speaker cable from the connector on the system board [1].
 - b Close the front bezel door.
 - c Press the release tabs [2], and slide the speaker [3] and the speaker cable [4] out of the slot.

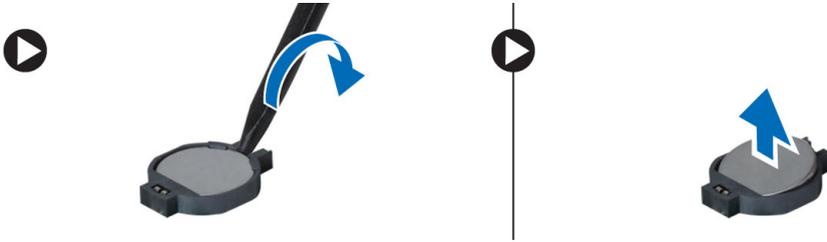


Installing the speaker

- 1 Insert the speaker into the slot and press it until it clicks into place.
- 2 Open the [front bezel door](#).
- 3 Connect the speaker cable to the connector on the system board.
- 4 Close the front bezel door.
- 5 Install the:
 - a [bezel](#)
 - b [cover](#)
- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the coin cell battery

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the coin cell battery:
 - a Using a plastic scribe, release the coin cell battery until it pops out.
 - b Remove the coin cell battery from the connector on the system board.

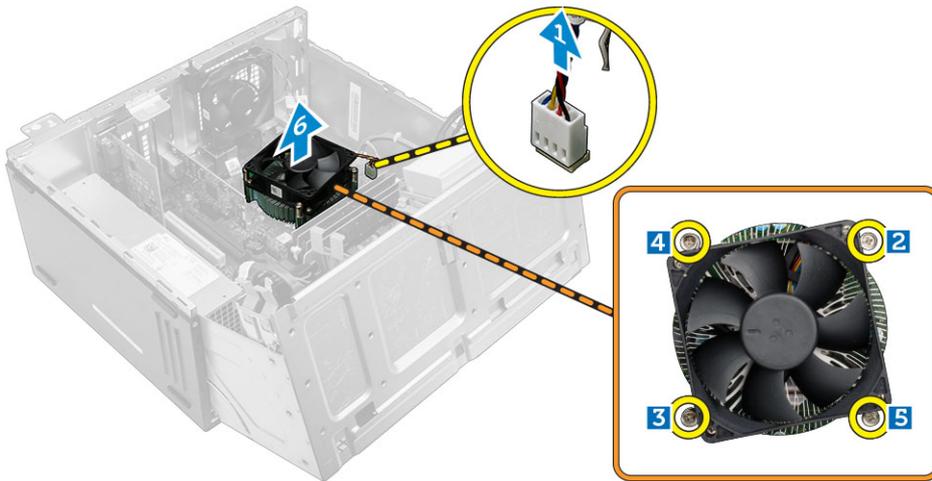


Installing the coin cell battery

- 1 Hold the coin cell battery with the "+" sign facing up and slide it under the securing tabs at the positive side of the connector.
- 2 Press the battery into the connector until it locks into place.
- 3 Close the front bezel door.
- 4 Install the:
 - [bezel](#)
 - [cover](#)
- 5 Follow the procedure in [After Working Inside Your Computer](#).

Removing the heat sink assembly

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 To remove the heat sink assembly:
 - a Disconnect the heat sink assembly cable from the connector on the system board [1].
 - b Loosen the captive screws that secure the heat sink assembly to the system board [2, 3, 4, 5].
 - c Lift the heat sink assembly away from the computer [6].



Installing the heat sink assembly

- 1 Place the heat sink assembly on the processor.
- 2 Tighten the captive screws to secure the heat sink assembly to the system board.
- 3 Connect the heat sink assembly cable to the connector on the system board.
- 4 Close the front bezel door.
- 5 Install the:
 - [bezel](#)
 - [cover](#)
- 6 Follow the procedure in [After Working Inside Your Computer](#).

Removing the processor

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - [cover](#)
 - [bezel](#)
- 3 Open the [front bezel door](#).
- 4 Remove the [heat sink assembly](#).
- 5 To remove the processor:
 - a Release the socket lever by pushing the lever down and out from under the tab on the processor shield [1].
 - b Lift the lever upward and lift the processor shield [2].
 - c Lift the processor out of the socket [3].

CAUTION: The processor socket pins are fragile and can be permanently damaged. Be careful not to bend the pins in the processor socket when removing the processor out of the socket.



Installing the processor

1 Align the processor with the socket keys.

CAUTION: Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.

2 Align the pin-1 indicator of the processor with the triangle on the socket.

3 Place the processor on the socket such that the slots on the processor align with the socket keys.

4 Close the processor shield by sliding it under the retention screw.

5 Lower the socket lever and push it under the tab to lock it.

6 Install the [heat sink assembly](#).

7 Close the front bezel door.

8 Install the:

a [bezel](#)

b [cover](#)

9 Follow the procedure in [After Working Inside Your Computer](#).

Removing the system fan

1 Follow the procedure in [Before Working Inside Your Computer](#).

2 Remove the:

• [cover](#)

• [bezel](#)

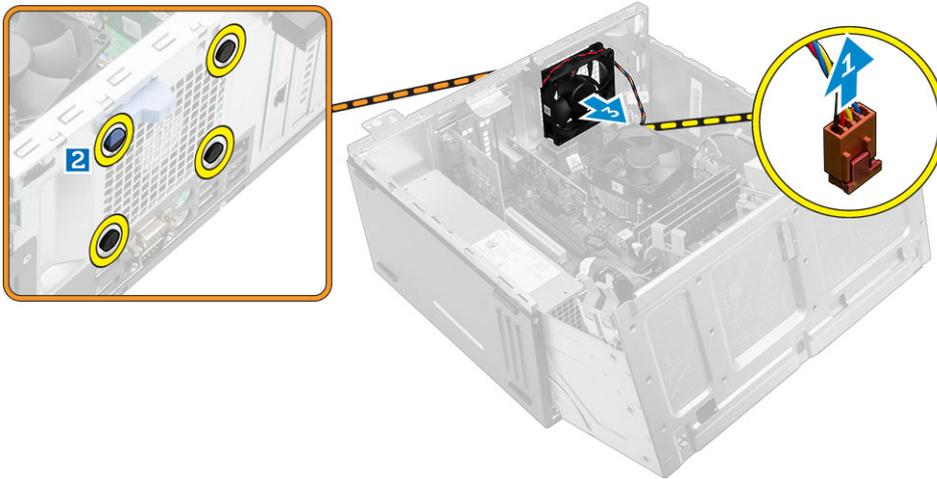
3 Open the [front bezel door](#).

4 To remove the system fan:

a Disconnect the system fan cable from the connector on the system board [1].

b Stretch the grommets securing the fan to the computer to ease the removal of the fan [2].

c Slide the system fan out of the computer [3].



Installing the system fan

1 Hold the system fan by the sides with the cable end facing the bottom of the computer.

2 Insert the grommets into the slots on the back of the computer.

3 Pass the grommets through the corresponding grooves on the system fan.

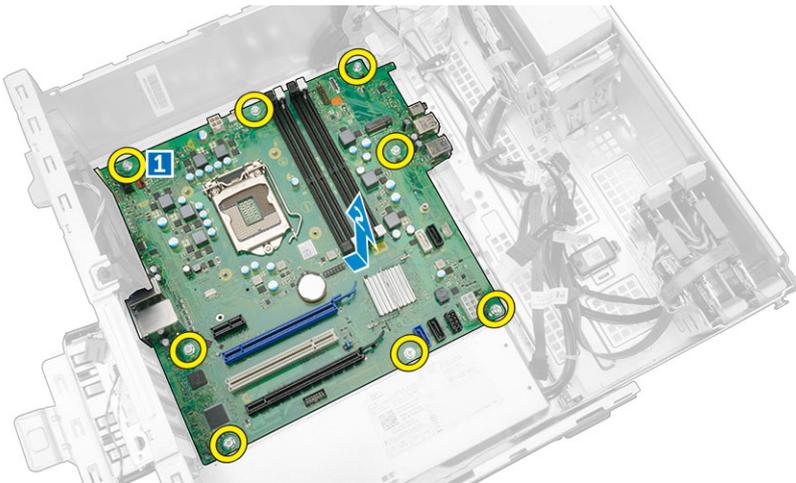
4 Stretch the grommets and slide the system fan toward the computer until it locks into place.

NOTE: Install the lower two grommets first.

- 5 Connect the system fan cable to the connector on the system board.
- 6 Close the front bezel door.
- 7 Install the:
 - a bezel
 - b cover
- 8 Follow the procedure in [After Working Inside Your Computer](#).

Removing the system board

- 1 Follow the procedure in [Before Working Inside Your Computer](#).
- 2 Remove the:
 - cover
 - bezel
- 3 Open the [front bezel door](#).
- 4 Remove the:
 - heat sink assembly
 - processor
 - PCIe expansion card
 - VGA daughter board
 - optional Ethernet port card
 - optional SSD card
 - memory module
- 5 Disconnect all the cables from the connectors on the system board.
- 6 To remove the system board:
 - a Remove the screws that secure the system board to the computer [1].
 - b Slide the system board toward the front of the computer and lift it away from the computer [2].



Installing the system board

- 1 Hold the system board by its edges and angle it toward the back of the computer.
- 2 Lower the system board into the computer until the connectors at the back of the system board align with the slots on the back wall of the computer, and the screw holes on the system board align with the standoffs on the computer.
- 3 Tighten the screws to secure the system board to the computer.
- 4 Route all the cables through the routing channels and connect all the cables to the connectors on the system board.
- 5 Install the:

- memory module
 - optional SSD card
 - optional Ethernet port card
 - PCIe expansion card
 - VGA daughter board
 - processor
 - heat sink assembly
- 6 Close the front bezel door.
 - 7 Install the:
 - bezel
 - cover
 - 8 Follow the procedure in [After Working Inside Your Computer](#).

Troubleshooting your computer

You can troubleshoot your computer using indicators like diagnostic lights, beep codes, and error messages during the operation of the computer.

Diagnostic and Power LED codes

Table 1. Power LED states

Power LED light status	Possible cause	Troubleshooting steps
Off	The computer is either turned off or is not receiving power or in Hibernation mode.	<ul style="list-style-type: none"> Re-seat the power cable in the power connector on the back of the computer and the electrical outlet. If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and is turned on. Also, bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly. Ensure the electrical outlet is working by testing it with another device, such as a lamp.
Solid amber / blinking amber	<p>The second state of the LED at power up, indicates that the POWER_GOOD signal is active and it is probable that the power supply is fine.</p> <p>Initial State of LED at power up. Refer to the table below for Blinking Amber pattern diagnostic suggestions and possible failures.</p>	<ul style="list-style-type: none"> Remove and reinstall any cards. Remove and reinstall the graphics card, if applicable. Ensure the power cable is connected to the system board and processor.
Slow Blinking white light	System is in a low power state, either S1 or S3. This does not indicate a fault condition.	<ul style="list-style-type: none"> Press the power button to bring the computer out of the sleep mode. Ensure all power cables are securely connected to the system board. Ensure the main power cable and front panel cable are connected to the system board.
Steady white	The computer is fully functional and in the On state.	If the computer is not responding, do the following:

Power LED light status	Possible cause	Troubleshooting steps
		<ul style="list-style-type: none"> Ensure the display is connected and turned on. If the display is connected and turned on, listen for a beep code.

NOTE: Amber LED blinking pattern : The pattern is 2 or 3 blinks followed by a short pause then X number of blinks up to 7. The repeated pattern has a long pause inserted in the middle. Example 2,3 = 2 amber blinks, short pause, 3 amber blinks followed by long pause then repeats.

Table 2. Diagnostic power LED codes

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
-	-	2 blinks > short pause > 1 blink > long pause > repeats	Bad Motherboard	Replace the motherboard
-	-	2 blinks > short pause > 2 blinks > long pause > repeats	Bad Motherboard, Power Supply or Power Supply cabling	If customer can assist to troubleshoot, narrow down the issue with PSU BIST Test, reseal cable. If nothing works, replace the motherboard, power supply or cabling
-	-	2 blinks > short pause > 3 blinks > long pause > repeats	Bad Motherboard, Memory or Processor	If customer can assist to troubleshoot, narrow down the issue by reseating memory and swapping an available known good memory. If nothing works, replace the motherboard, memory or processor
-	-	2 blinks > short pause > 4 blinks > long pause > repeats	Bad coin cell battery	If customer can assist to troubleshoot, narrow down the issue by swapping a known good coin cell battery if available. If nothing works, replace the coin cell battery
S1	RCM	2 blinks > short pause > 5 blinks > long pause > repeats	BIOS Checksum Failure	System is in Recovery Mode. Flash latest BIOS version. If problem persists, replace the motherboard
S2	CPU	2 blinks > short pause > 6 blinks > long pause > repeats	Bad Processor	CPU configuration activity is in progress or a CPU failure was

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
				detected. Replace the processor
S3	MEM	2 blinks > short pause > 7 blinks > long pause > repeats	Memory failures	Memory subsystem configuration activity is in progress. Appropriate memory modules were detected but a memory failure has occurred. If customer can assist to troubleshoot, narrow down the issue with reseating memory and swapping a known good memory if available. If nothing works, replace the memory.
S4	PCI	3 blinks > short pause > 1 blinks > long pause > repeats	PCIe Device or Video subsystem failures	PCIe device configuration activity is in progress or PCIe device failure was detected. If customer can assist to troubleshoot, narrow down the issue by reseating PCIe card and removing one by one to determine which card failed. If identified the PCIe card failed, replace the PCIe Card. If none of the PCIe Cards failed, replace the motherboard.
S5	VID	3 blinks > short pause > 2 blinks > long pause > repeats	Video Subsystem failure	Video subsystem configuration activity in progress or video subsystem failure. If customer can assist to troubleshoot, narrow down the issue by removing one by one to determine which card failed. If identified the card failed, replace the card. If none of the card failed, replace the motherboard.
S6	STO	3 blinks > short pause > 3 blinks > long pause > repeats	No Memory detected	If customer can assist to troubleshoot, narrow down the issue by removing one by one

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
				<p>memory to determine which one failed and swapping to a known good memory if available to confirm.</p> <p>If identified the memory failed, replace the memory.</p> <p>If none of the memory failed, replace the motherboard.</p>
S7	USB	<p>3 blinks > short pause ></p> <p>4 blinks > long pause > repeats</p>	Storage Subsystem failure	<p>Possible storage device configuration in progress or storage subsystem failure.</p> <p>If customer can assist to troubleshoot, narrow down the issue by removing one by one storages on motherboard to determine which one failed.</p> <p>If identified the storage failed, replace the storage.</p> <p>If identified the storage failed, replace the storage.</p>
S8	MEM	<p>3 blinks > short pause ></p> <p>5 blinks > long pause > repeats</p>	Memory configuration or incompatible error	<p>Memory subsystem configuration activity is in progress. No memory modules were detected.</p> <p>If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed. Also, combining the configuration to validate appropriate combination.</p> <p>If identified the component failed, replace the component.</p> <p>If none of the component failed, replace the motherboard.</p>
S9	MBF	<p>3 blinks > short pause ></p> <p>6 blinks > long pause > repeats</p>	System board failure	Fatal system board failure detected.

State	State Name	Blinking Amber Pattern	Problem Description	Suggested Resolution
				<p>If customer can assist to troubleshoot, narrow down the issue by removing one by one the component on motherboard to determine which one failed.</p> <p>If identified any of the component failed, replace the component.</p> <p>If none of the component failed, replace the motherboard.</p>
S10	MEM	<p>3 blinks > short pause ></p> <p>7 blinks > long pause > repeats</p>	Possible memory failure	<p>Memory subsystem configuration activity is in progress. Memory modules have been detected but appear to be incompatible or in an invalid configuration.</p> <p>If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed.</p> <p>If identified the memory failed, replace the memory.</p> <p>If else, replace the motherboard.</p>

⚠ WARNING: The power LED only serve as an indicator of the progress through the POST process. These LEDs do not indicate the problem that caused the POST routine to stop

Diagnostic error messages

Table 3. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the Pointing Device option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. Contact Dell.
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.

Error messages	Description
DATA ERROR	The hard drive cannot read the data.
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in Dell Diagnostics .
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, Contact Dell
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, <i>Printer out of paper</i> . Take the appropriate action.
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.

Error messages

INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM

KEYBOARD CLOCK LINE FAILURE

KEYBOARD CONTROLLER FAILURE

KEYBOARD DATA LINE FAILURE

KEYBOARD STUCK KEY FAILURE

LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT

MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE

MEMORY ALLOCATION ERROR

MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE

MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE

MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE

NO BOOT DEVICE AVAILABLE

NO BOOT SECTOR ON HARD DRIVE

NO TIMER TICK INTERRUPT

NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN

OPERATING SYSTEM NOT FOUND

OPTIONAL ROM BAD CHECKSUM

SECTOR NOT FOUND

Description

The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.

For external keyboards, check the cable connection. Run the **Keyboard Controller** test in **Dell Diagnostics**.

For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the **Keyboard Controller** test in **Dell Diagnostics**.

For external keyboards, check the cable connection. Run the **Keyboard Controller** test in **Dell Diagnostics**.

For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys during the boot routine. Run the **Stuck Key** test in **Dell Diagnostics**.

Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.

A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.

The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.

A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.

A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.

A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.

The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.

The operating system may be corrupted, [Contact Dell](#).

A chip on the system board may be malfunctioning. Run the **System Set** tests in **Dell Diagnostics**.

You have too many programs open. Close all windows and open the program that you want to use.

Reinstall the operating system. If the problem persists, [Contact Dell](#).

The optional ROM has failed. [Contact Dell](#).

The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See **Windows Help and Support** for instructions (click **Start > Help and Support**). If a large

Error messages	Description
SEEK ERROR	number of sectors are defective, back up the data (if possible), and then format the hard drive.
SHUTDOWN FAILURE	The operating system cannot find a specific track on the hard drive.
TIME-OF-DAY CLOCK LOST POWER	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics . If the message reappears, Contact Dell .
TIME-OF-DAY CLOCK STOPPED	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, Contact Dell .
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an electrical outlet to charge the battery. If the problem persists, Contact Dell .
TIMER CHIP COUNTER 2 FAILED	The time or date stored in the system setup program does not match the system clock. Correct the settings for the Date and Time options.
UNEXPECTED INTERRUPT IN PROTECTED MODE	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the System Memory tests and the Keyboard Controller test in Dell Diagnostics or Contact Dell .
	Insert a disk into the drive and try again.

System error messages

Table 4. System error messages

System message	Description
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The computer failed to complete the boot routine three consecutive times for the same error.
CMOS checksum error	RTC is reset, BIOS Setup default has been loaded.
CPU fan failure	CPU fan has failed.
System fan failure	System fan has failed.
Hard-disk drive failure	Possible hard disk drive failure during POST.
Keyboard failure	Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.
No boot device available	No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists. <ul style="list-style-type: none"> • If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device. • Enter system setup and ensure that the boot sequence information is correct.

System message**Description**

No timer tick interrupt

A chip on the system board might be malfunctioning or motherboard failure.

NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem

S.M.A.R.T error, possible hard disk drive failure.

System Setup

System Setup enables you to manage your computer hardware and specify BIOS level options. From the System Setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

- [Boot Sequence](#)
- [Navigation keys](#)
- [System Setup overview](#)
- [Accessing System Setup](#)
- [Updating the BIOS](#)
- [System and setup password](#)

Boot Sequence

Boot Sequence allows you to bypass the System Setup-defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive

NOTE: XXX denotes the SATA drive number.

- Optical Drive
- Diagnostics

NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.

The boot sequence screen also displays the option to access the System Setup screen.

Navigation keys

The following table displays the system setup navigation keys.

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Table 5. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Allows you to select a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.  NOTE: For the standard graphics browser only.
Esc	Moves to the previous page till you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.
F1	Displays the System Setup help file.

System Setup overview

System Setup allows you to:

- Change the system configuration information after you add, change, or remove any hardware in your computer.
- Set or change a user-selectable option such as the user password.
- Read the current amount of memory or set the type of hard drive installed.

Before you use System Setup, it is recommended that you write down the System Setup screen information for future reference.

 **CAUTION: Unless you are an expert computer user, do not change the settings for this program. Certain changes can cause your computer to work incorrectly.**

Accessing System Setup

- 1 Turn on (or restart) your computer.
- 2 After the white Dell logo appears, press F2 immediately.
The System Setup page is displayed.

 **NOTE: If you wait too long and the operating system logo appears, wait until you see the desktop. Then, shut down or restart your computer and try again.**

 **NOTE: After the Dell logo appears, you can also press F12 and then select BIOS setup.**

Updating the BIOS

It is recommended to update your BIOS (System Setup), on replacing the system board or if an update is available. For laptops, ensure that your computer battery is fully charged and connected to a power outlet

- 1 Restart the computer.
- 2 Go to **Dell.com/support**.
- 3 Enter the **Service Tag** or **Express Service Code** and click **Submit**.

 **NOTE: To locate the Service Tag, click Where is my Service Tag?**

 **NOTE: If you cannot find your Service Tag, click Detect My Product. Proceed with the instructions on screen.**

- 4 If you are unable to locate or find the Service Tag, click the Product Category of your computer.
- 5 Choose the **Product Type** from the list.

- 6 Select your computer model and the **Product Support** page of your computer appears.
- 7 Click **Get drivers** and click **View All Drivers**.
The Drivers and Downloads page opens.
- 8 On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.
- 9 Identify the latest BIOS file and click **Download File**.
You can also analyze which drivers need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.
- 10 Select your preferred download method in the **Please select your download method below** window, click **Download File**.
The **File Download** window appears.
- 11 Click **Save** to save the file on your computer.
- 12 Click **Run** to install the updated BIOS settings on your computer.
Follow the instructions on the screen.

NOTE: It is recommended not to update the BIOS version for more than 3 revisions. For example: If you want to update the BIOS from 1.0 to 7.0, then install version 4.0 first and then install version 7.0.

System and setup password

You can create a system password and a setup password to secure your computer.

Password type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data stored on your computer if it is not locked and left unattended.

NOTE: Your computer is shipped with the system and setup password feature disabled.

Assigning a system password and setup password

You can assign a new **System Password** and/or **Setup Password** or change an existing **System Password** and/or **Setup Password** only when **Password Status** is **Unlocked**. If the Password Status is **Locked**, you cannot change the System Password.

NOTE: If the password jumper is disabled, the existing System Password and Setup Password are deleted and you need not provide the system password to log on to the computer.

To enter the system setup, press F2 immediately after a power-on or re-boot.

- 1 In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
The **System Security** screen appears.
- 2 In the **System Security** screen, verify that **Password Status** is **Unlocked**.
- 3 Select **System Password**, enter your system password, and press Enter or Tab.
Use the following guidelines to assign the system password:
 - A password can have up to 32 characters.
 - The password can contain the numbers 0 through 9.
 - Only lower case letters are valid, upper case letters are not allowed.
 - Only the following special characters are allowed: space, ("), (+), (.), (-), (.), (/), (:), ([), (\), (]), (`).

Re-enter the system password when prompted.

- 4 Type the system password that you entered earlier and click **OK**.
- 5 Select **Setup Password**, type your system password and press Enter or Tab.

A message prompts you to re-type the setup password.

- 6 Type the setup password that you entered earlier and click **OK**.
- 7 Press Esc and a message prompts you to save the changes.
- 8 Press Y to save the changes.
The computer reboots.

Deleting or changing an existing system and/or setup password

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked. To enter the System Setup, press F2 immediately after a power-on or reboot.

- 1 In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
The **System Security** screen is displayed.
- 2 In the **System Security** screen, verify that **Password Status** is **Unlocked**.
- 3 Select **System Password**, alter or delete the existing system password and press Enter or Tab.
- 4 Select **Setup Password**, alter or delete the existing setup password and press Enter or Tab.

NOTE: If you change the System and/or Setup password, re-enter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

- 5 Press Esc and a message prompts you to save the changes.
- 6 Press Y to save the changes and exit from System Setup.
The computer reboots.

Specifications

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer in:

- Windows 10, click or tap **Start**  > **Settings** > **System** > **About**.
- Windows 8.1 and Windows 8, click or tap **Start**  > **PC Settings** > **PC and devices** > **PC Info**.
- Windows 7, click **Start** , right-click **My Computer**, and then select **Properties**.

Table 6. Processor

Feature	Specification
Processor type	6th Generation Intel Core i3/i5/i7 series
Total cache	Up to 8 MB cache depending on processor type

Table 7. Memory

Feature	Specification
Type	DDR3L
Speed	1600 MHz
Connectors	Four UDIMM slots
Memory module capacity	4 GB and 8 GB
Minimum memory	4 GB
Maximum memory	16 GB

NOTE: Each UDIMM slot supports a minimum of 4 GB and a maximum of 8 GB.

Table 8. Video

Feature	Specification
Integrated	Intel HD Graphics 530 / 510
Discrete	PCI Express x16 graphics adapter

Table 9. Audio

Feature	Specification
Integrated	Two channel High Definition Audio

Table 10. Network

Feature	Specification
Integrated	Intel 219–V Ethernet capable of 10/100/1000 Mb/s communication

Table 11. System information

Feature	Specification
System chipset	Intel 100 series, Q170
Interrupt levels	Integrated I/O APIC capability with 24 interrupts
BIOS chip (NVRAM)	16 MB

Table 12. Expansion bus

Feature	Specification
Bus type	PCIe gen3 , USB 2.0, and USB 3.0
Bus speed	PCI Express: <ul style="list-style-type: none"> · x1 slot each direction speed– up to 985 MB/s · x4 slot each direction speed- up to 3.94 GB/s · x16-slot each direction speed–16 GB/s SATA: 1.5 Gbps, 3.0 Gbps, and 6 Gbps

Table 13. Cards

Feature	Specification
PCI	One full-height card
PCI Express x1	One full-height card
PCI Express x16	Up to two full-height cards

Table 14. Drives

Feature	Specification
Externally accessible (5.25-inch drive bays)	Two

Table 15. External connectors

Feature	Specification
Audio	
Front panel	Universal Audio Jack
Back panel	Line-out connector
Network adapter	RJ–45 connector
Serial	9-pin connector; 16550 C compatible
Parallel	25-pin connector (optional)
USB 2.0	<ul style="list-style-type: none"> · Front panel: two

Feature	Specification
USB 3.0	<ul style="list-style-type: none"> Back panel: two Front panel: two Back panel: four
Video	<ul style="list-style-type: none"> 19-pin HDMI connector Two 20-pin DisplayPort connectors 15-pin VGA connector (optional) <p>NOTE: Available video connectors may vary based on the graphics card selected.</p>
Keyboard and mouse	<p>Back panel:</p> <ul style="list-style-type: none"> PS2 Keyboard 6-pin connector PS2 Mouse 6-pin connector

Table 16. Internal connectors

Feature	Specification
PCI 2.3 data width (maximum) — 32 bits	120-pin connector
PCI Express x1 data width (maximum) — one PCI Express lane	36-pin connector
PCI Express x16 (wired as x4) data width (maximum) — four PCI Express lanes	164-pin connector
PCI Express x16 data width (maximum) — 16 PCI Express lanes	164-pin connector
Serial ATA	Four 7-pin connectors
Memory	Four 240-pin connectors
Internal USB	10-pin connector
System Fan	4-pin connector
SSD	M.2 22x80 socket3
Front panel control	5-pin connector
Processor	1151-pin connector
Processor Fan	4-pin connector
Service mode jumper	2-pin connector
Password clear jumper	2-pin connector
RTC reset jumper	2-pin connector
Internal speaker	4-pin connector
Intruder connector	3-pin connector
Power connector	One 8-pin(for PSU), one 4-pin(for CPU), one 8-pin for SATA power

Table 17. Controls and lights

Feature	Specification
Front of the computer	
Power button light	White light — Solid white light indicates power-on state; blinking white light indicates sleep state of the computer.
Drive activity light	White light — Blinking white light indicates that the computer is reading data from or writing data to the hard drive.
Back of the computer	
Link integrity light on integrated network adapter	<ul style="list-style-type: none"> Green — a 10 Mbps connection exists between the network and the computer. Green — a 100 Mbps connection exists between the network and the computer. Orange — a 1000 Mbps connection exists between the network and the computer. Off (no light) — the computer is not detecting a physical connection to the network.
Network activity light on integrated network adapter	Yellow light — A blinking yellow light indicates that network activity is present.
Power supply diagnostic light	Green light — The power supply is turned on and is functional. The power cable must be connected to the power connector (at the back of the computer) and the electrical outlet.

Table 18. Power

 **NOTE: Heat dissipation is calculated by using the power supply wattage rating.**

Power	Wattage	Maximum Heat Dissipation	Voltage
	240 W	819.00 BTU/hr	100 VAC to 240 VAC, 50 Hz to 60 Hz, 4A/2A
Coin cell battery		3 V CR2032 lithium coin cell	

Table 19. Physical dimension

Physical Dimensions	Specification
Height	350.00 mm (13.77 inches)
Width	154.00 mm (6.06 inches)
Depth	274.00 mm (10.78 inches)
Weight	8.00 kg (17.64 lb)

Table 20. Environmental

Feature	Specification
Temperature range	
Operating	5°C to 35°C (41°F to 95°F)
Storage	-40°C to 65°C (-40°F to 149°F)

Feature	Specification
Relative humidity (maximum)	
Operating	20 percent to 80 percent (non-condensing)
Storage	5 percent to 95 percent (non-condensing)
Maximum vibration	
Operating	0.26 Grms
Storage	2.20 Grms
Maximum shock	
Operating	40 G
Storage	105 G
Altitude:	
Operating	-15.2 m to 3048 m (-50 to 10,000 ft)
Storage	-15.20 m to 10,668 m (-50 ft to 35,000 ft)
Airborne contaminant level	G1 or lower as defined by ANSI/ISA-S71.04-1985

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.