

# Dell Latitude 3470 Owner's Manual

Regulatory Model: P63G  
Regulatory Type: P63G001



# 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.

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# Contents

<b>1 Working on your computer.....</b>	<b>6</b>
Safety instructions.....	6
Before working inside your computer.....	7
Turning off your computer.....	7
After working inside your computer.....	8
<b>2 Removing and installing components.....</b>	<b>9</b>
Recommended tools.....	9
Removing the battery.....	9
Installing the battery.....	9
Removing the base cover.....	10
Installing the base cover.....	10
Removing the keyboard.....	10
Installing the keyboard.....	11
Removing the hard drive assembly.....	11
Installing the hard drive assembly.....	12
Removing the hard drive bracket.....	12
Installing the hard drive bracket.....	12
Removing the WLAN card.....	13
Installing the WLAN card.....	13
Removing the memory module.....	13
Installing the memory module.....	14
Removing the palmrest.....	14
Installing the palmrest.....	15
Removing the coin cell battery.....	15
Installing the coin cell battery.....	16
Removing the USB board.....	16
Installing the USB board.....	17
Removing the VGA board.....	17
Installing the VGA board.....	17
Removing the speakers.....	18
Installing the speakers.....	18
Removing the system fan.....	19
Installing the system fan.....	19
Removing the display cable.....	20
Installing the display cable.....	20
Removing the power connector port.....	20
Installing the power connector port.....	21

Removing the system board.....	21
Installing the system board.....	22
Removing the heat sink.....	22
Installing the heat sink.....	23
Removing the display assembly.....	24
Installing the display assembly.....	24
Removing the display bezel.....	25
Installing the display bezel.....	26
Removing the camera.....	26
Installing the camera.....	27
Removing the display panel.....	27
Installing the display panel.....	28
<b>3 System Setup.....</b>	<b>29</b>
Boot Sequence.....	29
Navigation keys.....	29
System Setup overview.....	30
Accessing System Setup.....	30
General screen options.....	31
System Configuration screen options.....	31
Video screen options.....	33
Security screen options.....	33
Secure Boot screen options.....	35
Performance screen options.....	36
Power Management screen options.....	36
POST Behavior screen options.....	38
Virtualization support screen options.....	39
Wireless screen options.....	39
Maintenance screen options.....	39
System Log screen options.....	40
Updating the BIOS .....	40
System and setup password.....	40
Assigning a system password and setup password.....	41
Deleting or changing an existing system and/or setup password.....	41
<b>4 Diagnostics.....</b>	<b>43</b>
Enhanced Pre-Boot System Assessment (ePSA) diagnostics.....	43
Device status lights.....	44
Battery status lights.....	44
<b>5 Technical specifications.....</b>	<b>45</b>
System specifications.....	45

Processor specifications.....	45
Memory specifications.....	45
Audio specifications.....	46
Video specifications.....	46
Camera specifications.....	46
Communication specifications.....	46
Port and connector specifications.....	47
Display specifications.....	47
Keyboard specifications.....	48
Touchpad specifications.....	48
Battery specifications.....	48
AC Adapter specifications.....	49
Physical specifications.....	49
Environmental specifications.....	50
<b>6 Contacting Dell.....</b>	<b>51</b>

# Working on your computer

## Safety instructions

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](http://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.**

## Before working inside your computer

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

1. Ensure that you follow the [Safety instructions](#).
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
3. 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.**

4. Disconnect all the network cables from the computer.
5. Disconnect your computer and all attached devices from the electrical outlets.
6. Press and hold the power button while the computer is unplugged to ground the system board.
7. 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 you connect any external devices, cards, and cables before turning on your computer.

 **CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.**

1. Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
2. Connect any telephone or network cables to your computer.

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

3. Replace the battery.
4. Replace the base cover.
5. Connect your computer and all attached devices to their electrical outlets.
6. Turn on your computer.

# Removing and installing components

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

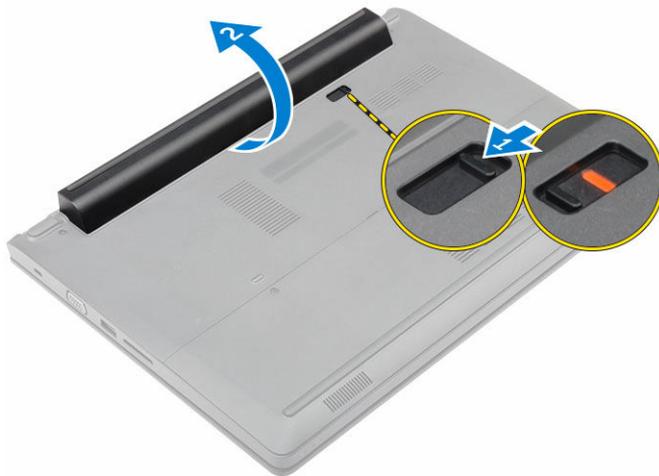
## Recommended tools

The procedures in this document require the following tools:

- Small flat blade screwdriver
- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Small plastic scribe

## Removing the battery

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. To remove the battery:
  - a. Slide the battery latch to release the battery [1].
  - b. Pull and lift the battery to remove it from the computer [2].



## Installing the battery

1. Insert the battery into the slot until it clicks in place.
2. Follow the procedure in [After Working Inside Your computer](#).

## Removing the base cover

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the [battery](#).
3. To remove the base cover:
  - a. Loosen the captive screws that secure the base cover to the computer [1].
  - b. Using a plastic scribe, pry the base cover and remove it from the computer [2].

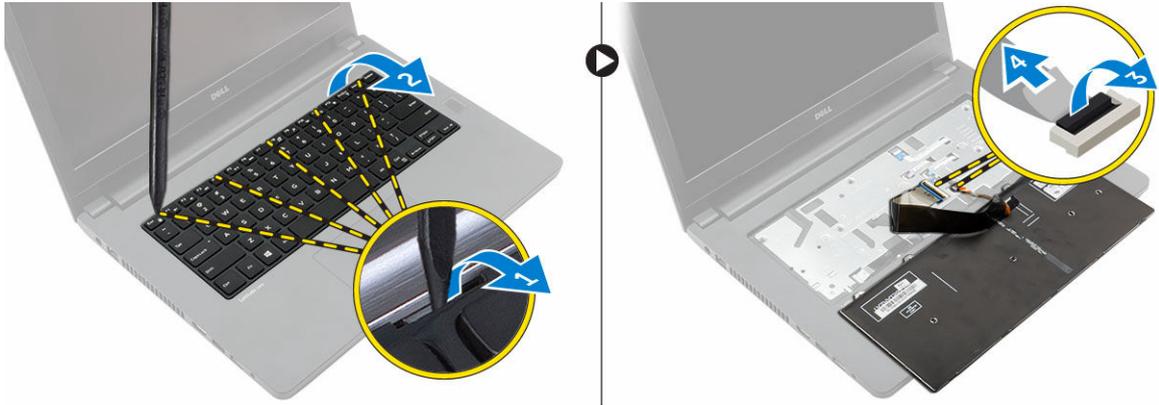


## Installing the base cover

1. Replace the base cover on the computer until it clicks in place.
2. Tighten the captive screws to secure the base cover to the computer.
3. Install the [battery](#).
4. Follow the procedure in [After Working Inside Your computer](#).

## Removing the keyboard

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the [battery](#).
3. Flip the computer and open the display to access the keyboard.
4. To remove the keyboard:
  - a. Using a plastic scribe, release the keyboard from the edges [1] and lift the keyboard from the computer [2].
  - b. Release the latch and disconnect the keyboard cables from the connectors on the system board [3, 4].

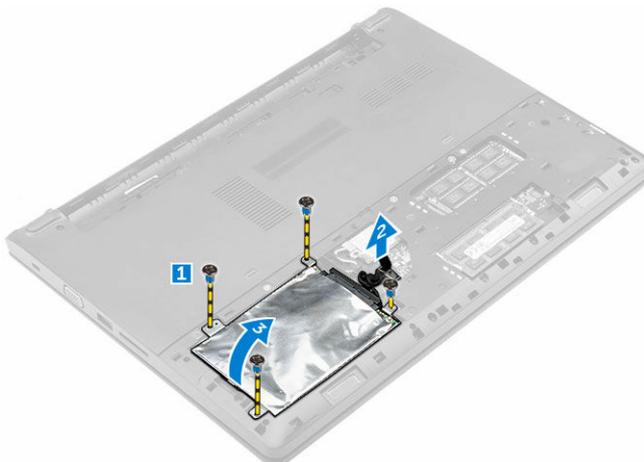


## Installing the keyboard

1. Connect the keyboard cables to the connectors on the system board.
2. Place the keyboard on the computer and press along all the sides until it clicks in place.
3. Install the [battery](#).
4. Follow the procedure in [After Working Inside Your computer](#).

## Removing the hard drive assembly

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
3. To remove the hard drive assembly:
  - a. Remove the screws that secure the hard drive assembly to the computer [1].
  - b. Disconnect the hard drive assembly cable from the connector on the system board [2].
  - c. Lift and remove the hard drive assembly from the computer [3].

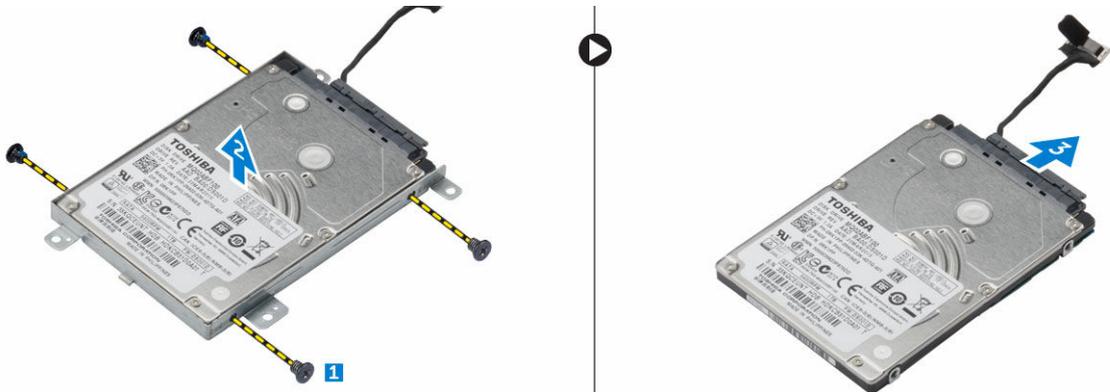


## Installing the hard drive assembly

1. Replace the hard drive assembly into the slot on the computer.
2. Connect the hard drive assembly cable to the connector on the system board.
3. Tighten the screws to secure the hard drive assembly to the computer.
4. Install the:
  - a. [battery](#)
  - b. [base cover](#)
5. Follow the procedure in [After Working Inside Your computer](#).

## Removing the hard drive bracket

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
3. To remove the hard drive bracket:
  - a. Remove the screws to release the hard drive bracket from the hard drive assembly [1].
  - b. Remove the hard drive from the hard drive bracket [2].
  - c. Disconnect the hard drive cable from the hard drive [3].

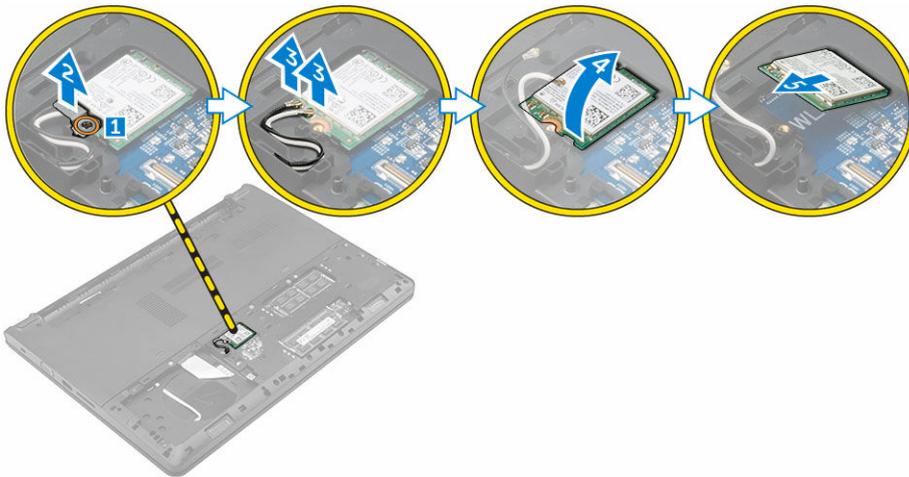


## Installing the hard drive bracket

1. Connect the hard drive cable to the connector on the hard drive.
2. Place the hard drive brackets on the hard drive to align the screw holders on both sides of the hard drive.
3. Tighten the screws to secure the hard drive bracket to the hard drive.
4. Install the:
  - a. [hard drive assembly](#)
  - b. [base cover](#)
  - c. [battery](#)
5. Follow the procedure in [After Working Inside Your computer](#).

## Removing the WLAN card

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
3. To remove the WLAN card:
  - a. Loosen the captive screw [1] to remove the metal tab from the WLAN card [2].
  - b. Disconnect the WLAN cables from the WLAN card [3].
  - c. Using a plastic scribe, release the WLAN card from the computer [4].
  - d. Disconnect the WLAN card from the connector to remove it [5].



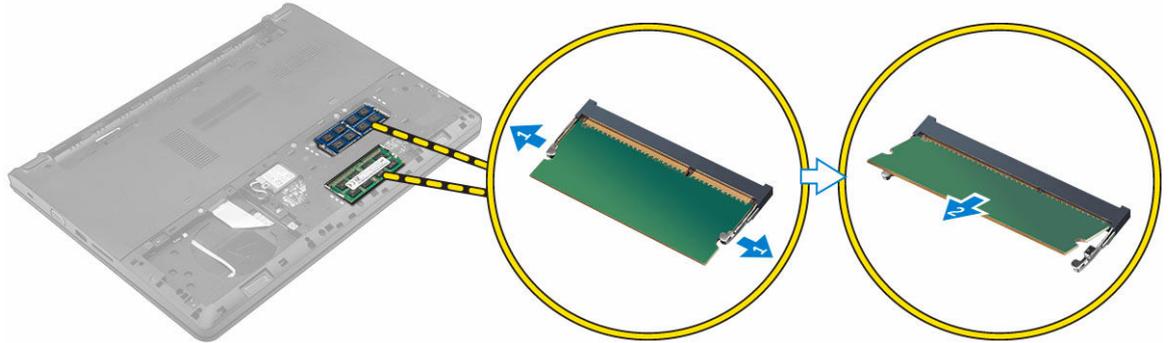
## Installing the WLAN card

1. Connect the WLAN card to the connector on the system board.
2. Connect the WLAN antenna cables to the connectors on the WLAN card.
3. Place the metal tab to align it with the screw holder on the WLAN card to secure the WLAN cables.
4. Tighten the captive screw to secure the WLAN card to the computer.
5. Install:
  - a. [base cover](#)
  - b. [battery](#)
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:
  - a. [battery](#)
  - b. [base cover](#)
3. To remove the memory module:

- a. Release the retention clips away from the memory module until the memory module pops up [1].
- b. Disconnect the memory module from the connector to remove it from the computer [2].

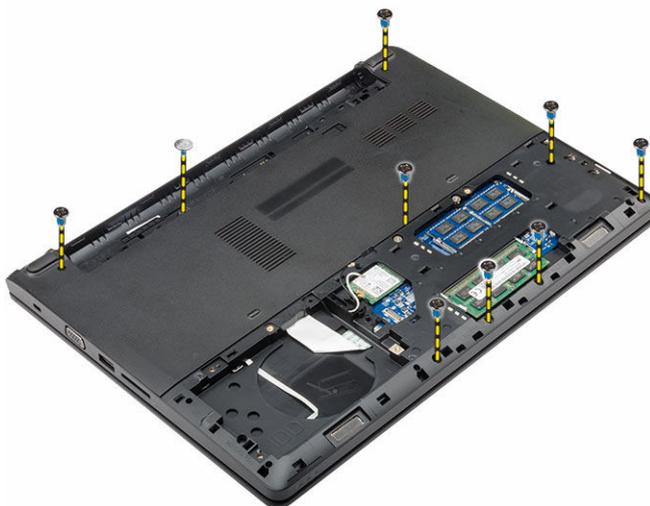


## Installing the memory module

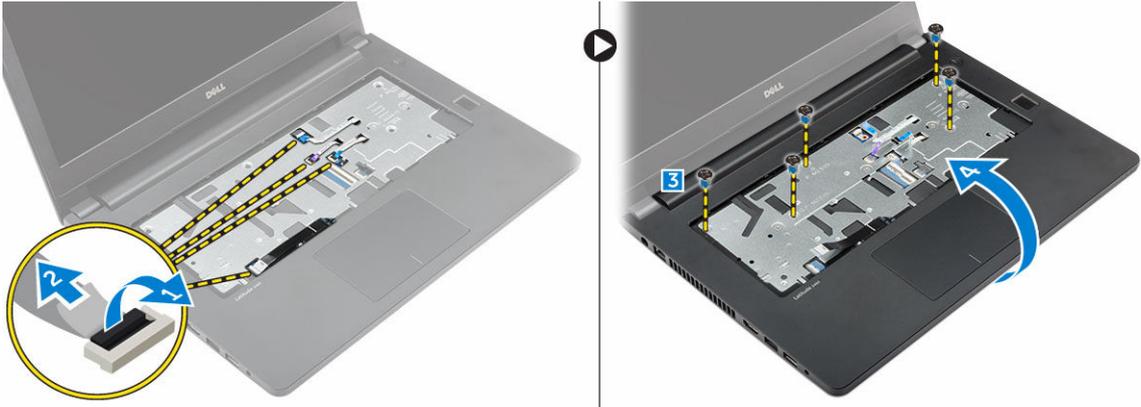
1. Insert the memory module into the connector and press until the memory module clicks into the place.
2. Install the:
  - a. [base cover](#)
  - b. [battery](#)
3. Follow the procedure in [After Working Inside Your computer](#).

## Removing the palmrest

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
3. Remove the screws that secure the palmrest to the computer.



4. To remove the palmrest:
  - a. Release the latch and disconnect the power button, finger print reader, touchpad, and LED cables from the connectors on the system board [1, 2].
  - b. Remove the screws that secure the palmrest to the computer [3].
  - c. Using a plastic scribe, release the palmrest from the edges and remove it from the computer [4].

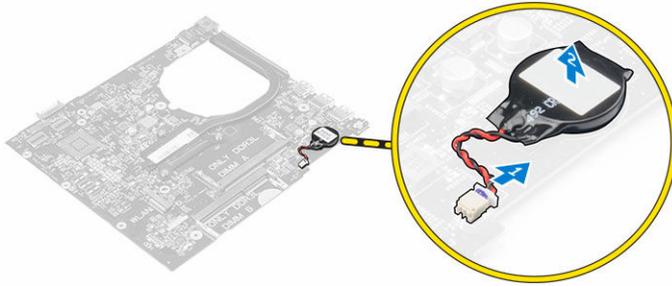


## Installing the palmrest

1. Place the palmrest on the computer and press along all the sides until it clicks in place.
2. Connect the power button, finger print reader, touchpad, and LED cables to the connectors on the system board.
3. Flip the computer and tighten the screws to secure the palmrest to the computer.
4. Install the:
  - a. [keyboard](#)
  - b. [hard drive assembly](#)
  - c. [base cover](#)
  - d. [battery](#)
5. 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:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
  - f. [system board](#)
3. To remove the coin cell battery:
  - a. Disconnect the coin cell battery cable from the connector on the system board.
  - b. Lift and remove the coin cell battery from the adhesive on the system board.

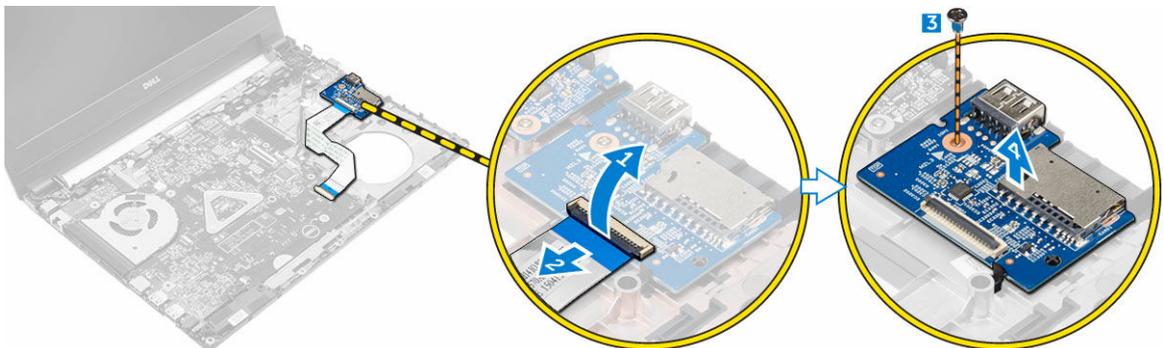


## Installing the coin cell battery

1. Replace the coin cell battery in the slot on the system board.
2. Connect the coin cell battery to the connector on the system board.
3. Install the:
  - a. [system board](#)
  - b. [palmrest](#)
  - c. [keyboard](#)
  - d. [hard drive assembly](#)
  - e. [base cover](#)
  - f. [battery](#)
4. Follow the procedure in [After Working Inside Your computer](#).

## Removing the USB board

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
3. To remove the USB board:
  - a. Lift the latch and disconnect the USB board cable from the connector on the USB board [1, 2].
  - b. Remove the screw that secures the USB board to the computer [3].
  - c. Lift and remove the USB board from the computer [4].

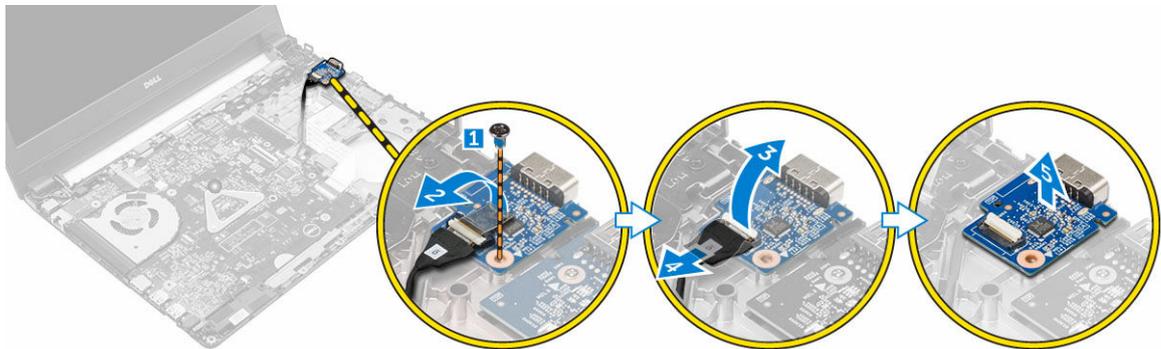


## Installing the USB board

1. Place the USB board into the slot on the computer.
2. Tighten the screw to secure the USB board to the computer.
3. Connect the USB board cable to the connector on the USB board.
4. Install the:
  - a. [palmrest](#)
  - b. [keyboard](#)
  - c. [hard drive assembly](#)
  - d. [base cover](#)
  - e. [battery](#)
5. Follow the procedure in [After Working Inside Your computer](#).

## Removing the VGA board

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
3. To remove the VGA board:
  - a. Peel the adhesive tape to access the VGA board cable [1].
  - b. Lift the latch and disconnect the VGA board cable from the connector on the VGA board [2, 3].
  - c. Remove the screw that secures the VGA board to the computer.
  - d. Lift and remove the VGA board from the computer [4].



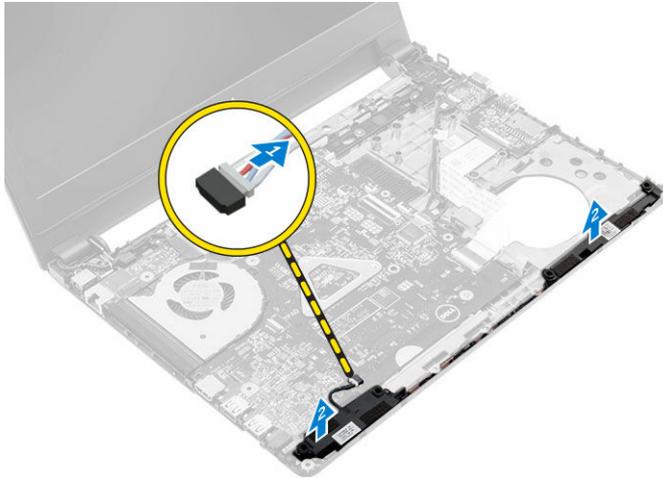
## Installing the VGA board

1. Place the VGA board into the slot on the computer.
2. Tighten the screw to secure the VGA board to the computer.
3. Connect the VGA board cable to the connector on the VGA board.
4. Fix the adhesive tape to secure the VGA board cable.

5. Install the:
  - a. [palmrest](#)
  - b. [keyboard](#)
  - c. [hard drive assembly](#)
  - d. [base cover](#)
  - e. [battery](#)
6. Follow the procedure in [After Working Inside Your computer](#).

## Removing the speakers

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
3. To remove the speakers:
  - a. Disconnect the speaker cable from the connector on the system board [1].
  - b. Lift and remove the left speaker from the computer [2].
  - c. Release the speaker cable from the routing channels.
  - d. Lift and remove the right speaker from the computer [2].



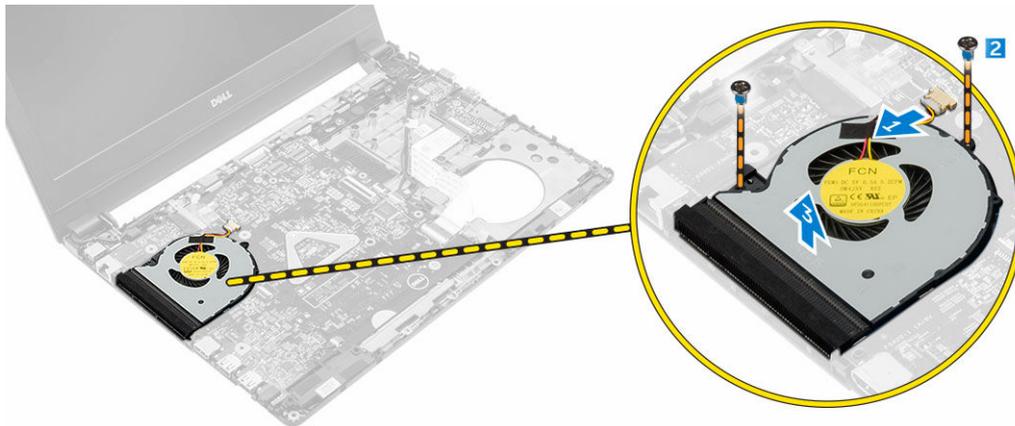
## Installing the speakers

1. Place the speakers on both slots on the computer.
2. Route the speaker cable to align it through the routing channels.
3. Connect the speaker cable to the connector on the system board.
4. Install the:
  - a. [palmrest](#)
  - b. [keyboard](#)
  - c. [hard drive assembly](#)

- d. [base cover](#)
- e. [battery](#)
5. 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:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
3. To remove the system fan:
  - a. Disconnect the system fan cable from the connector on the system board [1].
  - b. Remove the screws that secure the system fan to the computer [2].
  - c. Lift and remove the system fan from the computer [3].

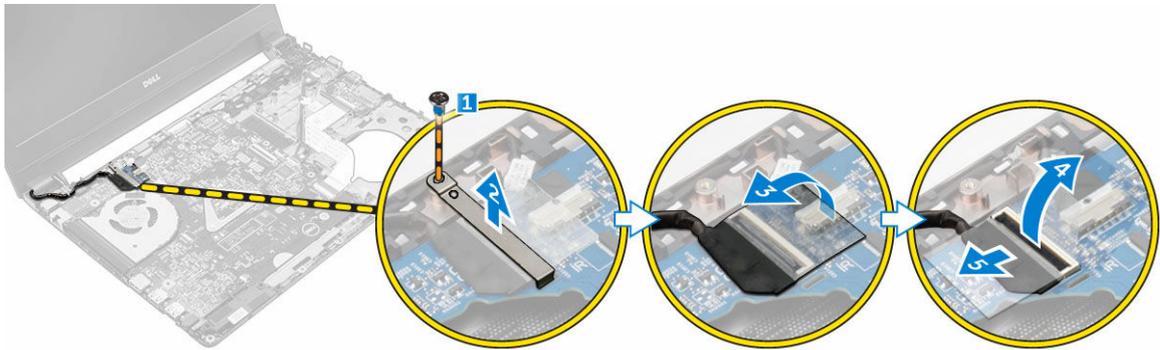


## Installing the system fan

1. Place the system fan into the slot on the computer.
2. Tighten the screws to secure the system fan to the computer.
3. Connect the system fan cable to the connector on the system board.
4. Install the:
  - a. [palmrest](#)
  - b. [keyboard](#)
  - c. [hard drive assembly](#)
  - d. [base cover](#)
  - e. [battery](#)
5. Follow the procedure in [After Working Inside Your computer](#).

## Removing the display cable

1. Follow the procedure in [Before Working Inside Your Computer.](#)
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
3. To remove the display cable:
  - a. Remove the screw to release the metal tab that secures the display cable [1].
  - b. Lift the metal tab to access the display cable [2].
  - c. Peel the adhesive tape that secures the display cable [3].
  - d. Disconnect the display cable from the connector on the system board [4].



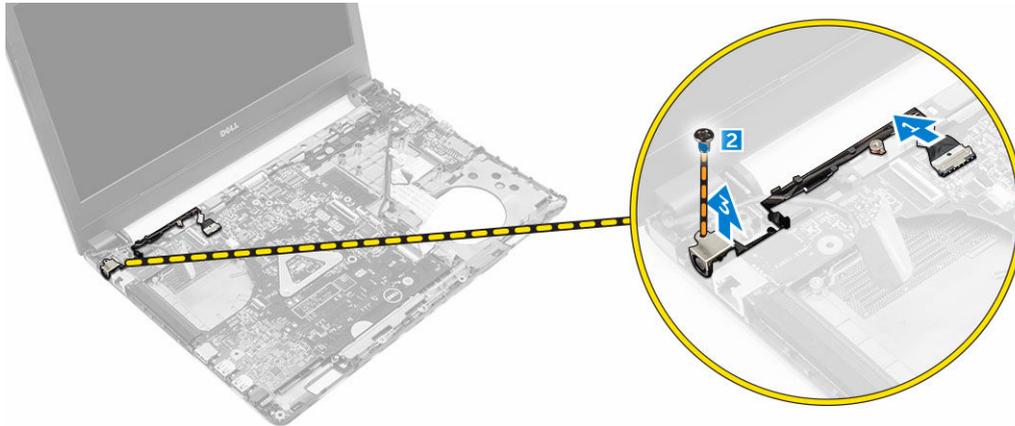
## Installing the display cable

1. Connect the display cable to the connector on the system board.
2. Affix the adhesive tape to secure the display cable.
3. Place the metal tab on the display cable.
4. Tighten the screw to secure the metal tab.
5. Install the:
  - a. [palmrest](#)
  - b. [keyboard](#)
  - c. [hard drive assembly](#)
  - d. [base cover](#)
  - e. [battery](#)
6. Follow the procedure in [After Working Inside Your computer.](#)

## Removing the power connector port

1. Follow the procedure in [Before Working Inside Your Computer.](#)
2. Remove the:
  - a. [battery](#)

- b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [keyboard](#)
  - e. [palmrest](#)
  - f. [display cable](#)
3. To remove the power connector port:
- a. Disconnect the power connector port cable from the connector on the system board [1].
  - b. Release the power connector port cable from the placeholders.
  - c. Remove the screw that secures that power connector port to the computer [2].
  - d. Lift and remove the power connector port from the computer [3].



## Installing the power connector port

1. Insert the power connector port into the slot on the computer.
2. Route the power connector port cable through the routing channels.
3. Connect the power connector port cable to the connector on the system board.
4. Tighten the screw to secure the power connector port to the computer.
5. Install the:
  - a. [display cable](#)
  - b. [palmrest](#)
  - c. [keyboard](#)
  - d. [hard drive assembly](#)
  - e. [base cover](#)
  - f. [battery](#)
6. 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:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [WLAN card](#)

- e. [memory](#)
  - f. [keyboard](#)
  - g. [palmrest](#)
  - h. [display cable](#)
  - i. [system fan](#)
3. To remove the system board:
- a. Disconnect all the cables from the connectors on the system board.
  - b. Remove the screw that secures the system board to the computer [1].
  - c. Lift and remove the system board from the computer [2].



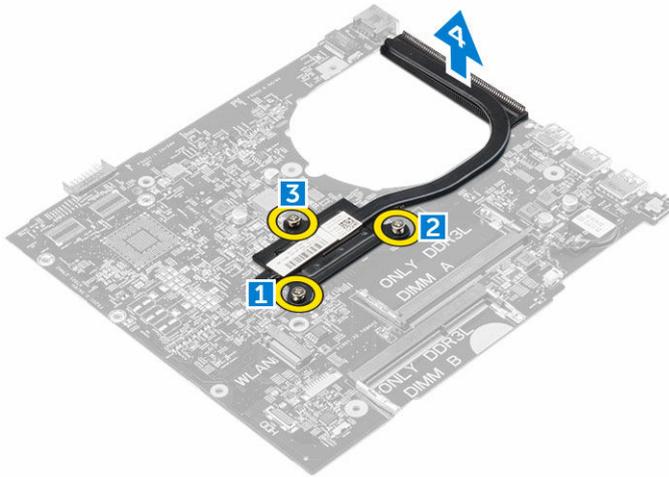
## Installing the system board

1. Place the system board into the slot on the computer.
2. Connect all the cables to the connectors on the system board
3. Tighten the screw to secure the system board to the computer.
4. Install the:
  - a. [system fan](#)
  - b. [display cable](#)
  - c. [palmrest](#)
  - d. [keyboard](#)
  - e. [memory](#)
  - f. [WLAN card](#)
  - g. [hard drive assembly](#)
  - h. [base cover](#)
  - i. [battery](#)
5. Follow the procedure in [After Working Inside Your computer](#).

## Removing the heat sink

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)

- b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [WLAN card](#)
  - e. [memory](#)
  - f. [keyboard](#)
  - g. [palmrest](#)
  - h. [display cable](#)
  - i. [system fan](#)
  - j. [system board](#)
3. To remove the heat sink:
- a. Remove the screws that secure the heat sink to the system board [1, 2, 3].
  - b. Lift and remove the heat sink from the computer [4].

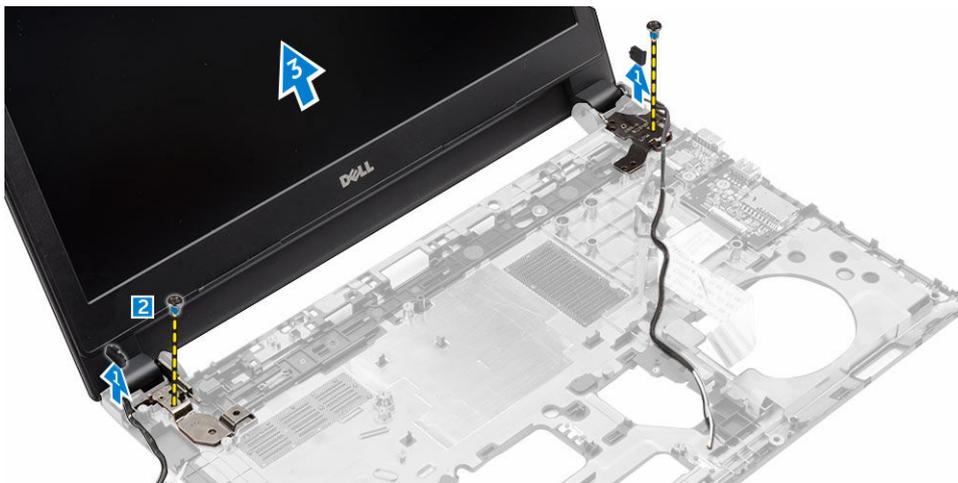


## Installing the heat sink

- 1. Place the heat sink to align with the screw holders on the system board.
- 2. Tighten the screws to secure the heat sink to the system board.
- 3. Install the:
  - a. [system board](#)
  - b. [system fan](#)
  - c. [display cable](#)
  - d. [palmrest](#)
  - e. [keyboard](#)
  - f. [memory](#)
  - g. [WLAN card](#)
  - h. [hard drive assembly](#)
  - i. [base cover](#)
  - j. [battery](#)
- 4. Follow the procedure in [After Working Inside Your computer](#).

## Removing the display assembly

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [WLAN card](#)
  - e. [memory](#)
  - f. [keyboard](#)
  - g. [palmrest](#)
  - h. [display cable](#)
  - i. [power connector port](#)
  - j. [system fan](#)
  - k. [system board](#)
3. To remove the display assembly:
  - a. Remove the rubber on both sides of the computer [1].
  - b. Remove the screws that secure the display assembly to the chassis [2].
  - c. Lift and remove the display assembly from the chassis [3].



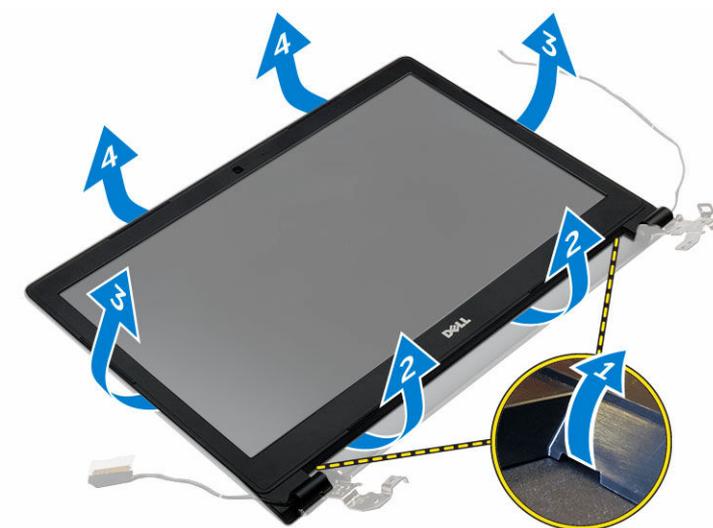
## Installing the display assembly

1. Place the display assembly to align with the screw holders on the chassis.
2. Place the rubber on both sides of the computer.
3. Tighten the screws to secure the display assembly to the chassis.
4. Install the:
  - a. [system board](#)
  - b. [system fan](#)
  - c. [display cable](#)
  - d. [power connector port](#)
  - e. [palmrest](#)

- f. [keyboard](#)
  - g. [memory](#)
  - h. [WLAN card](#)
  - i. [hard drive assembly](#)
  - j. [base cover](#)
  - k. [battery](#)
5. Follow the procedure in [After Working Inside Your computer](#).

## Removing the display bezel

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [WLAN card](#)
  - e. [memory](#)
  - f. [keyboard](#)
  - g. [palmrest](#)
  - h. [display cable](#)
  - i. [system fan](#)
  - j. [system board](#)
  - k. [power connector port](#)
  - l. [display assembly](#)
3. To remove the display bezel:
  - a. Using a plastic scribe, release the display bezel from the bottom of the display assembly [1].
  - b. Release the display bezel from its edges and remove the display bezel from the display assembly [2, 3, 4].

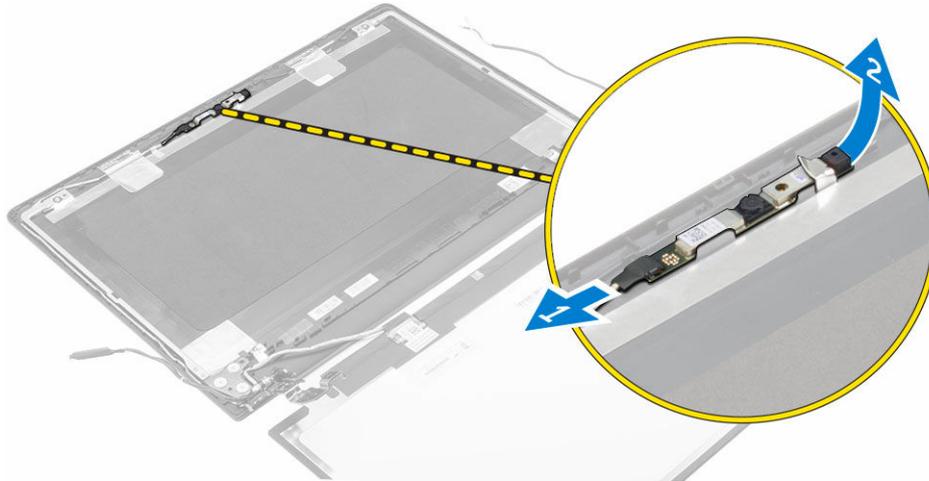


## Installing the display bezel

1. Place the display bezel on the computer and press along all the sides until it clicks in place.
2. Install the:
  - a. [display assembly](#)
  - b. [power connector port](#)
  - c. [system board](#)
  - d. [system fan](#)
  - e. [display cable](#)
  - f. [palmrest](#)
  - g. [keyboard](#)
  - h. [memory](#)
  - i. [WLAN card](#)
  - j. [hard drive assembly](#)
  - k. [base cover](#)
  - l. [battery](#)
3. Follow the procedure in [After Working Inside Your computer](#).

## Removing the camera

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [WLAN card](#)
  - e. [memory](#)
  - f. [keyboard](#)
  - g. [palmrest](#)
  - h. [display cable](#)
  - i. [system fan](#)
  - j. [system board](#)
  - k. [power connector port](#)
  - l. [display assembly](#)
  - m. [display bezel](#)
3. To remove the camera:
  - a. Disconnect the camera cable from the connector on the display assembly [1].
  - b. Lift and remove the camera from the display assembly [2].



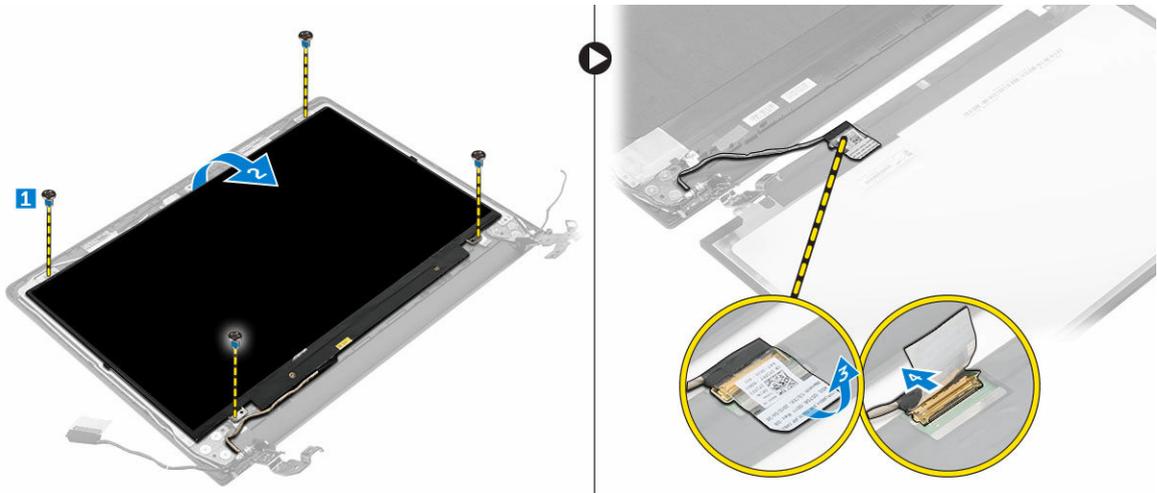
## Installing the camera

1. Insert the camera into the slot on the display assembly.
2. Connect the camera cable to the connector on the display assembly.
3. Install the:
  - a. [display bezel](#)
  - b. [display assembly](#)
  - c. [power connector port](#)
  - d. [system board](#)
  - e. [system fan](#)
  - f. [display cable](#)
  - g. [palmrest](#)
  - h. [keyboard](#)
  - i. [memory](#)
  - j. [WLAN card](#)
  - k. [hard drive assembly](#)
  - l. [base cover](#)
  - m. [battery](#)
4. Follow the procedure in [After Working Inside Your computer](#).

## Removing the display panel

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Remove the:
  - a. [battery](#)
  - b. [base cover](#)
  - c. [hard drive assembly](#)
  - d. [WLAN card](#)
  - e. [memory](#)
  - f. [keyboard](#)
  - g. [palmrest](#)
  - h. [display cable](#)

- i. [system fan](#)
  - j. [system board](#)
  - k. [power connector port](#)
  - l. [display assembly](#)
  - m. [display bezel](#)
3. To remove the display panel:
- a. Remove the screws that secure the display panel to the display assembly [1].
  - b. Remove the display panel from the display assembly [2].
  - c. Peel the adhesive tape [3] and disconnect the LVDS cable from the connector on the display panel [4].



## Installing the display panel

1. Connect the LVDS cable to the connector on the display panel.
2. Affix the adhesive tape to secure the LVDS cable.
3. Place the display panel aligning with the screw holders on the display assembly.
4. Tighten the screw to secure the display panel to the display assembly.
5. Install the:
  - a. [display bezel](#)
  - b. [display assembly](#)
  - c. [power connector port](#)
  - d. [system board](#)
  - e. [system fan](#)
  - f. [display cable](#)
  - g. [palmrest](#)
  - h. [keyboard](#)
  - i. [memory](#)
  - j. [WLAN card](#)
  - k. [hard drive assembly](#)
  - l. [base cover](#)
  - m. [battery](#)
6. Follow the procedure in [After Working Inside Your computer](#).

## 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

## 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 1. 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.
	 <b>NOTE:</b> 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**.

## General screen options

This section lists the primary hardware features of your computer.

Option	Description				
<b>System Information</b>	<ul style="list-style-type: none"><li>• System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code.</li><li>• Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM A Size, DIMM B Size.</li><li>• Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit technology.</li><li>• Device Information: Displays Primary Hard Drive, SATA-0, M.2PCIe SSD-0, Dock eSATA Device, LOM MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, WiFi Device, WiGig Device, Cellular Device, Bluetooth Device.</li></ul>				
<b>Battery Information</b>	Displays the battery status and the type of AC adapter connected to the computer.				
<b>Boot Sequence</b>	<table><tbody><tr><td><b>Boot Sequence</b></td><td>Allows you to change the order in which the computer attempts to find an operating system. The options are:<ul style="list-style-type: none"><li>• Windows Boot Manager</li><li>• UEFI: Hard drive details</li></ul></td></tr><tr><td><b>Boot List Options</b></td><td>Allows you to change the boot list option:<ul style="list-style-type: none"><li>• Legacy</li><li>• UEFI (enabled by default)</li></ul></td></tr></tbody></table>	<b>Boot Sequence</b>	Allows you to change the order in which the computer attempts to find an operating system. The options are: <ul style="list-style-type: none"><li>• Windows Boot Manager</li><li>• UEFI: Hard drive details</li></ul>	<b>Boot List Options</b>	Allows you to change the boot list option: <ul style="list-style-type: none"><li>• Legacy</li><li>• UEFI (enabled by default)</li></ul>
<b>Boot Sequence</b>	Allows you to change the order in which the computer attempts to find an operating system. The options are: <ul style="list-style-type: none"><li>• Windows Boot Manager</li><li>• UEFI: Hard drive details</li></ul>				
<b>Boot List Options</b>	Allows you to change the boot list option: <ul style="list-style-type: none"><li>• Legacy</li><li>• UEFI (enabled by default)</li></ul>				
<b>Advanced Boot Options</b>	This option allows you the legacy option ROMs to load. By default, the <b>Enable Legacy Option ROMs</b> is disabled.				
<b>Date/Time</b>	Allows you to change the date and time.				

## System Configuration screen options

Option	Description
<b>Integrated NIC</b>	Allows you to configure the integrated network controller. The options are: <ul style="list-style-type: none"><li>• Disabled</li><li>• Enabled</li><li>• Enabled w/PXE: This option is enabled by default.</li></ul>
<b>SATA Operation</b>	Allows you to configure the internal SATA hard-drive controller. The options are:

Option	Description
	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• AHCI</li> </ul> <p>:This option is enabled by default.</p>
<b>Drives</b>	<p>Allows you to configure the SATA drives on board. All drives are enabled by default. The options are:</p> <ul style="list-style-type: none"> <li>• SATA-0</li> </ul>
<b>SMART Reporting</b>	<p>This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification. This option is disabled by default.</p> <ul style="list-style-type: none"> <li>• Enable SMART Reporting</li> </ul>
<b>USB Configuration</b>	<p>This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (HDD, memory key, floppy).</p> <p>If USB port is enabled, device attached to this port is enabled and available for OS.</p> <p>If USB port is disabled, the OS cannot see any device attached to this port.</p> <p>The options are:</p> <ul style="list-style-type: none"> <li>• Enable USB Boot Support (by default enable)</li> <li>• Enable External USB Port (by default enable)</li> </ul>
<b>Audio</b>	<p>This field enables or disables the integrated audio controller. By default, the <b>Enable Audio</b> option is selected. The options are:</p> <ul style="list-style-type: none"> <li>• Enable Microphone (by default enable)</li> <li>• Enable Internal Speaker (by default enable)</li> </ul>
<b>Keyboard Illumination</b>	<p>This field lets you choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 0% to 100%. The options are:</p> <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Dim</li> <li>• Bright (enabled by default)</li> </ul>
<b>Keyboard Backlight with AC</b>	<p>The Keyboard Backlight with AC option does not affect the main keyboard illumination feature. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled.</p>
<b>Unobtrusive Mode</b>	<p>This option, when enabled, pressing Fn+F7 turns off all light and sound emissions in the system. To resume normal operation, press Fn+F7 again. This option is disabled by default.</p>

Option	Description
<b>Miscellaneous Devices</b>	Allows you to enable or disable the following devices: <ul style="list-style-type: none"> <li>• Enable Microphone</li> <li>• Enable Camera</li> <li>• Enable Hard Drive Free Fall Protection</li> <li>• Enable Media Card</li> <li>• Disable Media Card</li> </ul>

 **NOTE:** All devices are enabled by default.

## Video screen options

Option	Description
<b>LCD Brightness</b>	Allows you to set the display brightness depending up on the power source (On Battery and On AC).
<b>Switchable Graphics</b>	Allows you to enable or disable the switchable graphics technologies, such as NVIDIA, Optimus, and AMD PowerExpress\X99.

 **NOTE:** The video setting will be visible only when a video card is installed into the system.

## Security screen options

Option	Description
<b>Admin Password</b>	Allows you to set, change, or delete the administrator (admin) password. <p> <b>NOTE:</b> You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.</p> <p> <b>NOTE:</b> Successful password changes take effect immediately.</p> <p>Default setting: Not set</p>
<b>System Password</b>	Allows you to set, change or delete the system password. <p> <b>NOTE:</b> Successful password changes take effect immediately.</p> <p>Default setting: Not set</p>
<b>Internal HDD-0 Password</b>	Allows you to set, change or delete the system's internal hard disk's password. <p>Default setting: Not set</p>
<b>Strong Password</b>	Allows you to enforce the option to always set strong passwords. <p>Default Setting: Enable Strong Password is not selected.</p>

Option	Description
	 <b>NOTE:</b> If Strong Password is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.
<b>Password Configuration</b>	Allows you to determine the minimum and maximum length of Administrator and System passwords.
<b>Password Bypass</b>	Allows you to enable or disable the permission to bypass the System and the Internal HDD password, when they are set. The options are: <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Reboot bypass</li> </ul> Default setting: Disabled
<b>Password Change</b>	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default setting: <b>Allow Non-Admin Password Changes</b> is selected.
<b>Non-Admin Setup Changes</b>	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password.
<b>TPM Security</b>	Allows you to enable the Trusted Platform Module (TPM) during POST. The options are: <ul style="list-style-type: none"> <li>• TPM Security</li> <li>• Clear</li> <li>• TPM ACPI Support</li> <li>• TPM PPI Provision Override</li> <li>• TPM PPI Deprovision Override</li> <li>• Deactivate</li> <li>• Activate</li> </ul>  <b>NOTE:</b> The TPM version 1.2 is supported for all Windows operating system.  <b>NOTE:</b> The TPM version 1.2 is for only for Windows 7/8.1 operating system. The TPM version 1.2/2.0 is for Windows 10 operating system. You can upgrade/downgrade for Windows 10 operating system.  <b>CAUTION: For the TPM upgrade/downgrade process, it is recommended to complete the process in an AC power with AC adapter plugged into the computer. The upgrade/downgrade process without the AC adapter plugged in might damage the computer or hard disk.</b>  <b>NOTE:</b> It is recommended to use the Dell AC adapter that is shipped with the computer.
<b>Computrace</b>	Allows you to activate or disable the optional Computrace software The options are:

Option	Description
	<ul style="list-style-type: none"> <li>Deactivate</li> <li>Disable</li> <li>Activate</li> </ul> <p> <b>NOTE:</b> The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed</p> <p>Default setting: Deactivate</p>
<b>CPU XD Support</b>	<p>Allows you to enable the Execute Disable mode of the processor.</p> <p>Enable CPU XD Support (default)</p>
<b>Admin Setup Lockout</b>	<p>Allows you to prevent users from entering the setup when an Administrator password is set.</p> <p>Default Setting: Enable Admin Setup Lockout is not selected.</p>

## Secure Boot screen options

Option	Description
<b>Secure Boot Enable</b>	<p>This option enables or disables the <b>Secure Boot</b> feature.</p> <ul style="list-style-type: none"> <li>Disabled</li> <li>Enabled</li> </ul> <p>Default setting: Enabled.</p>
<b>Expert Key Management</b>	<p>Allows you to manipulate the security key databases only if the system is in Custom Mode. The <b>Enable Custom Mode</b> option is disabled by default. The options are:</p> <ul style="list-style-type: none"> <li>PK</li> <li>KEK</li> <li>db</li> <li>dbx</li> </ul> <p>If you enable the <b>Custom Mode</b>, the relevant options for <b>PK, KEK, db, and dbx</b> appear. The options are:</p> <ul style="list-style-type: none"> <li><b>Save to File</b>—Saves the key to a user-selected file</li> <li><b>Replace from File</b>—Replaces the current key with a key from a user-selected file</li> <li><b>Append from File</b>—Adds a key to the current database from a user-selected file</li> <li><b>Delete</b>—Deletes the selected key</li> <li><b>Reset All Keys</b>—Resets to default setting</li> <li><b>Delete All Keys</b>—Deletes all the keys</li> </ul>

Option	Description
	 <b>NOTE:</b> If you disable the <b>Custom Mode</b> , all the changes made will be erased and the keys will restore to default settings.

## Performance screen options

Option	Description
<b>Multi Core Support</b>	<p>This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. This option is enabled by default. Allows you to enable or disable multi-core support for the processor. The installed processor supports two cores. If you enable Multi Core Support, two cores are enabled. If you disable Multi Core Support, one core is enabled.</p> <ul style="list-style-type: none"> <li>• Enable Multi Core Support</li> </ul> <p>Default setting: The option is enabled.</p>
<b>Intel SpeedStep</b>	<p>Allows you to enable or disable the Intel SpeedStep feature.</p> <ul style="list-style-type: none"> <li>• Enable Intel SpeedStep</li> </ul> <p>Default setting: The option is enabled.</p>
<b>C-States Control</b>	<p>Allows you to enable or disable the additional processor sleep states.</p> <ul style="list-style-type: none"> <li>• C states</li> </ul> <p>Default setting: The option is enabled.</p>
<b>Hyper-Thread Control</b>	<p>Allows you to enable or disable the Hyper-Threading in the processor.</p> <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul> <p>Default setting: Enabled.</p>

## Power Management screen options

Option	Description
<b>AC Behavior</b>	<p>Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected.</p> <p>Default setting: Wake on AC is not selected.</p>
<b>Auto On Time</b>	<p>Allows you to set the time at which the computer must turn on automatically. The options are:</p>

Option	Description
	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Every Day</li> <li>• Weekdays</li> <li>• Select Days</li> </ul> <p>Default setting: Disabled</p>
<b>USB Wake Support</b>	<p>Allows you to enable USB devices to wake the system from Standby.</p> <p> <b>NOTE:</b> This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup removes power from all the USB ports to conserve battery power.</p> <ul style="list-style-type: none"> <li>• Enable USB Wake Support</li> </ul> <p>Default setting: The option is disabled.</p>
<b>Wireless Radio Control</b>	<p>Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection.</p> <ul style="list-style-type: none"> <li>• Control WLAN Radio</li> </ul> <p>Default setting: The option is disabled.</p>
<b>Wake on LAN/WLAN</b>	<p>Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal.</p> <ul style="list-style-type: none"> <li>• Disabled</li> <li>• LAN Only</li> <li>• WLAN Only</li> <li>• LAN or WLAN</li> </ul> <p>Default setting: Disabled</p>
<b>Block Sleep</b>	<p>This option lets you block entering to sleep (S3 state) in operating system environment.</p> <p>Block Sleep (S3 state)</p> <p>Default setting: This option is disabled</p>
<b>Advanced Battery Charge Configuration</b>	<p>This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours to improve the battery health.</p> <p>Disabled</p> <p>Default setting: Disabled</p>

Option	Description
<b>Primary Battery Charge Configuration</b>	<p>Allows you to select the charging mode for the battery. The options are:</p> <ul style="list-style-type: none"> <li>• Adaptive</li> <li>• Standard — Fully charges your battery at a standard rate.</li> <li>• ExpressCharge — The battery charges over a shorter period of time using Dell's fast charging technology. This option is enabled by default.</li> <li>• Primarily AC use</li> <li>• Custom</li> </ul> <p>If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.</p> <p> <b>NOTE:</b> All charging mode may not be available for all the batteries. To enable this option, disable the <b>Advanced Battery Charge Configuration</b> option.</p>

## POST Behavior screen options

Option	Description
<b>Adapter Warnings</b>	<p>Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters.</p> <p>Default setting: Enable Adapter Warnings</p>
<b>Fn Key Emulation</b>	<p>Allows you to set the option where the Scroll Lock key is used to simulate the Fn key feature.</p> <p>Enable Fn Key Emulation (default)</p>
<b>Fn Lock Options</b>	<p>Allows you to let hot key combinations Fn + Esc toggle the primary behavior of F1–F12, between their standard and secondary functions. If you disable this option, you cannot toggle dynamically the primary behavior of these keys. The available options are:</p> <ul style="list-style-type: none"> <li>• Fn Lock. This option is selected by default.</li> <li>• Lock Mode Disable/Standard</li> <li>• Lock Mode Enable/Secondary</li> </ul>
<b>Fastboot</b>	<p>Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are:</p> <ul style="list-style-type: none"> <li>• Minimal</li> <li>• Thorough (default)</li> <li>• Auto</li> </ul>
<b>Extended BIOS POST Time</b>	<p>Allows you to create an additional preboot delay. The options are:</p> <ul style="list-style-type: none"> <li>• 0 seconds. This option is enabled by default.</li> <li>• 5 seconds</li> </ul>

Option	Description
	<ul style="list-style-type: none"> <li>• 10 seconds</li> </ul>

## Virtualization support screen options

Option	Description
<b>Virtualization</b>	Allows you to enable or disable the Intel Virtualization Technology. Enable Intel Virtualization Technology (default).
<b>VT for Direct I/O</b>	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. Enable VT for Direct I/O - enabled by default.

## Wireless screen options

Option	Description
<b>Wireless Switch</b>	<p>Allows to set the wireless devices that can be controlled by the wireless switch. The options are:</p> <ul style="list-style-type: none"> <li>• WWAN</li> <li>• GPS (on WWAN Module)</li> <li>• WLAN/WiGig</li> <li>• Bluetooth</li> </ul> <p>All the options are enabled by default.</p> <p> <b>NOTE:</b> For WLAN and WiGig enable or disable controls are tied together and they cannot be enabled or disabled independently.</p>
<b>Wireless Device Enable</b>	<p>Allows you to enable or disable the internal wireless devices.</p> <ul style="list-style-type: none"> <li>• WLAN</li> <li>• Bluetooth</li> </ul> <p>All the options are enabled by default.</p>

## Maintenance screen options

Option	Description
<b>Service Tag</b>	Displays the Service Tag of your computer.
<b>Asset Tag</b>	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.

Option	Description
<b>BIOS Downgrade</b>	This controls flashing of the system firmware to previous revisions.

## System Log screen options

Option	Description
<b>BIOS Events</b>	Allows you to view and clear the System Setup (BIOS) POST events.

## 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, ("), (+), (.), (-), (.), (/), (:), (I), (\), (I), (').
- 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 promoted. If you delete the System and/or Setup password, confirm the deletion when promoted.

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.

# Diagnostics

If you experience a problem with your computer, run the ePSA diagnostics before contacting Dell for technical assistance. The purpose of running diagnostics is to test your computer's hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

## Enhanced Pre-Boot System Assessment (ePSA) diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

 **CAUTION: Use the system diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.**

 **NOTE:** Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

1. Power-on the computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.  
The **Enhanced Pre-boot System Assessment** window is displayed, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.
4. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
5. Select the device from the left pane and click **Run Tests**.
6. If there are any issues, error codes are displayed.  
Note the error code and contact Dell.

## Device status lights

Table 2. Device status lights

Icon	Description
	Turns on when you turn on the computer and blinks when the computer is in a power management mode.
	Turns on steadily or blinks to indicate battery charge status.

## Battery status lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

**Alternately blinking amber light and white light** An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.

**Alternately blinking amber light with steady white light** Temporary battery failure with AC adapter present.

**Constantly blinking amber light** Fatal battery failure with AC adapter present.

**Light off** Battery in full charge mode with AC adapter present.

**White light on** Battery in charge mode with AC adapter present.

## Technical 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**.

## System specifications

Feature	Specification
DRAM bus width	64 bits
Flash EPROM	16 MB

## Processor specifications

Feature	Specification
Type	6th Generation Intel i3, i5 and i7
L1 cache	64 KB
L2 cache	256 KB
L3 cache	Up to 4 MB

## Memory specifications

Feature	Specification
Memory connector	two internally accessible DDR3L connectors
Memory capacity	4 GB and 8 GB
Memory type	1600 MHz (dual channel DDR3L configuration)
Minimum memory	4 GB

Feature	Specification
Maximum memory	16 GB (8x2) GB

## Audio specifications

Feature	Specification
Types	4 channel high definition audio
Controller	Realtek ALC3246
Stereo conversion	24-bit (analog-to-digital and digital-to-analog)
Interface	Intel HDA bus
Speakers	2 W x 2 W
Volume controls	Program menu and keyboard media-control keys

## Video specifications

Feature	Specification
Video Type	Integrated on system board/discrete
UMA controller	Intel HD 520 Graphics 6th Generation Core i3, i5, and i7
Discrete controller	GT920M
Data bus	64 bits

## Camera specifications

Feature	Specification
Camera resolution	0.92 megapixels
Video resolution	1280x720 at 30 fps (maximum)
Diagonal viewing angle	74°
	 <b>NOTE:</b> The RGB + IR camera is for <b>Windows Hello</b> application only and other applications cannot use it.

## Communication specifications

Features	Specification
Network adapter	10/100/1000 Mbps Ethernet LAN on Motherboard (LOM)
Wireless	Wi-Fi 802.11 b/g/n and 802.11a/b/g/n/ac

## Port and connector specifications

Feature	Specification
Audio	one headphone/microphone combo port (headset)
Video	<ul style="list-style-type: none"><li>• one 15-pin VGA port</li><li>• one 19-pin HDMI port</li></ul>
Network adapter	one RJ-45 port
USB	<ul style="list-style-type: none"><li>• two USB 3.0 ports (left one with window debug)</li><li>• one USB 2.0 port</li></ul> <p> <b>NOTE:</b> The powered USB 3.0 connector also supports Microsoft Kernel Debugging. The ports are identified in the documentation shipped with your computer.</p>
Media card reader	SD card
Memory card reader	one (SD, SDHC, SDXC)
Fingerprint reader	one (optional)

## Display specifications

Feature	Specification
Type	14.0 inches HD WLED
Height	205.60 mm
Width	320.90 mm
Diagonal	14.0 inches
Active area (X/Y)	309.40 mm x 173.95 mm (12.18 inches x 6.85 inches)
Maximum resolution	1920 x 1080 pixels (FHD)1920 x 1080 pixels (FHD)
Typical brightness	200 nits
Operating angle	0° (closed) to Min 135°
Refresh rate	60 Hz
Minimum viewing angle horizontal	40°/40°
Minimum viewing angle vertical	10°/30°

Feature	Specification
Pixel pitch	0.265 mm x 0.265 mm
External display	VGA

## Keyboard specifications

Feature	Specification
Number of keys	US 80, Brazil 82, UK 81, and Japan 84

## Touchpad specifications

Feature	Specification
Active Area:	
X-axis	104.00 mm (4.09 inches)
Y-axis	64.00 mm (2.52 inches)

## Battery specifications

Feature	Specification
Type	<ul style="list-style-type: none"> <li>4-cell smart lithium ion (40 W)</li> <li>6-cell smart lithium ion (65 W)</li> </ul>
Height	<ul style="list-style-type: none"> <li>4-cell – 7.8 mm</li> <li>6-cell – 7.8 mm</li> </ul>
Width	<ul style="list-style-type: none"> <li>4-cell – 124.7 mm</li> <li>6-cell – 124.7 mm</li> </ul>
Depth	<ul style="list-style-type: none"> <li>4-cell – 208.25 mm</li> <li>6-cell – 208.25 mm</li> </ul>
Weight	<ul style="list-style-type: none"> <li>4-cell – 283 g</li> <li>6-cell – 350 g</li> </ul>
Voltage	<ul style="list-style-type: none"> <li>4-cell – 7.4 VDC</li> <li>6-cell – 11.1 VDC</li> </ul>

<b>Feature</b>	<b>Specification</b>
Life span	300 discharge/charge cycles
Temperature range:	
Operating	0 °C to 50 °C (32 °F to 122 °F)
Non-operating	-20 °C to 65 °C (-4 °F to 149 °F)
Coin cell battery	3 V CR2032 lithium coin cell

## AC Adapter specifications

<b>Feature</b>	<b>Specification</b>
Type	65 W and 90 W
Input voltage	100 V AC to 240 V AC
Input current (maximum)	1.50 A/ 1.60 A/ 1.70 A/ 2.50 A
Input frequency	50 Hz to 60 Hz
Output current	3.34 A/ 4.62 A
Rated output voltage	19.5 V DC
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 specifications

<b>Feature</b>	<b>Specification</b>
Height (non-touch)	23.15 mm (0.91 inches)
Height (touch)	23.15 mm (0.91 inches)
Width (non-touch)	243.30 mm (9.58 inches)
Width (touch)	243.30 mm (9.58 inches)
Depth (non-touch)	342 mm (13.46 inches)
Depth (touch)	342 mm (13.46 inches)
Minimum weight (non-touch)	1.81 kg (4.00 lbs)

<b>Feature</b>	<b>Specification</b>
<b>Minimum weight (touch)</b>	1.81 kg (4.00 lbs)

## **Environmental specifications**

<b>Temperature</b>	<b>Specifications</b>
<b>Operating</b>	0°C to 35°C (32°F to 95°F)
<b>Storage</b>	-40°C to 65°C (-40°F to 149°F)

<b>Relative humidity (maximum)</b>	<b>Specifications</b>
<b>Operating</b>	10 % to 90 % (non condensing)
<b>Storage</b>	10 % to 95 % (non condensing)

<b>Altitude (maximum)</b>	<b>Specifications</b>
<b>Operating</b>	-15.2 m to 3048 m (-50 ft to 10,000 ft)
<b>Non-operating</b>	-15.2 m to 10,668 m (-50 ft to 35,000 ft)

<b>Airborne contaminant level</b>	G1 as defined by ISA-S71.04-1985
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## 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.