Dell Latitude 14 Rugged — 5414 Series

Owner's Manual

1.0

Regulatory Model: P46G
Regulatory Type: P46G002
August 2020
Rev. A02

Notes, cautions, and warnings

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

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

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

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Contents

1

Working on your computer

Topics:

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and 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 the reverse order.

NOTE: 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.

NOTE: 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 that is grounded to ground yourself before you touch the computer to perform any disassembly tasks.

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 instruction.
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
3. Turn off your computer.
4. If the computer is connected to a docking device (docked) such as the optional Media Base or Battery Slice, undock it.

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

5. Disconnect all network cables from the computer.
6. Disconnect your computer and all attached devices from their electrical outlets.
7. Turn the computer upside-down on a flat work surface.

   NOTE: Ensure to close the display if the system is a laptop. To avoid damaging the system board, remove the main battery before you service the computer.

8. Remove the main battery.
9. Turn the computer top-side up.

   NOTE: Open the display if the system is a laptop.

10. Press the power button to ground the system board.

    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.

11. Remove any installed ExpressCards or Smart Cards from the appropriate slots.

Turning off your computer

Turning off your computer — Windows 7

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

1. Click **Start**.
2. Click **Shut Down**.

   NOTE: 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.

Turning off your computer — Windows 8

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 8 (using a touch enabled device):
     a. Swipe in from the right edge of the screen, opening the **Charms** menu and select **Settings**.
     b. Tap ⏻ and then tap **Shut down**
   - In Windows 8 (using a mouse):
     a. Point to upper-right corner of the screen and click **Settings**.
     b. Click ⏻ and then 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.

Turning off your — Windows

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

1. Click or tap  .
2. Click or tap and then click or tap **Shut down**.

   NOTE: 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 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. Connect your computer and all attached devices to their electrical outlets.
4. Turn on your computer.

2

System Overview

Topics:

- System overview

System overview

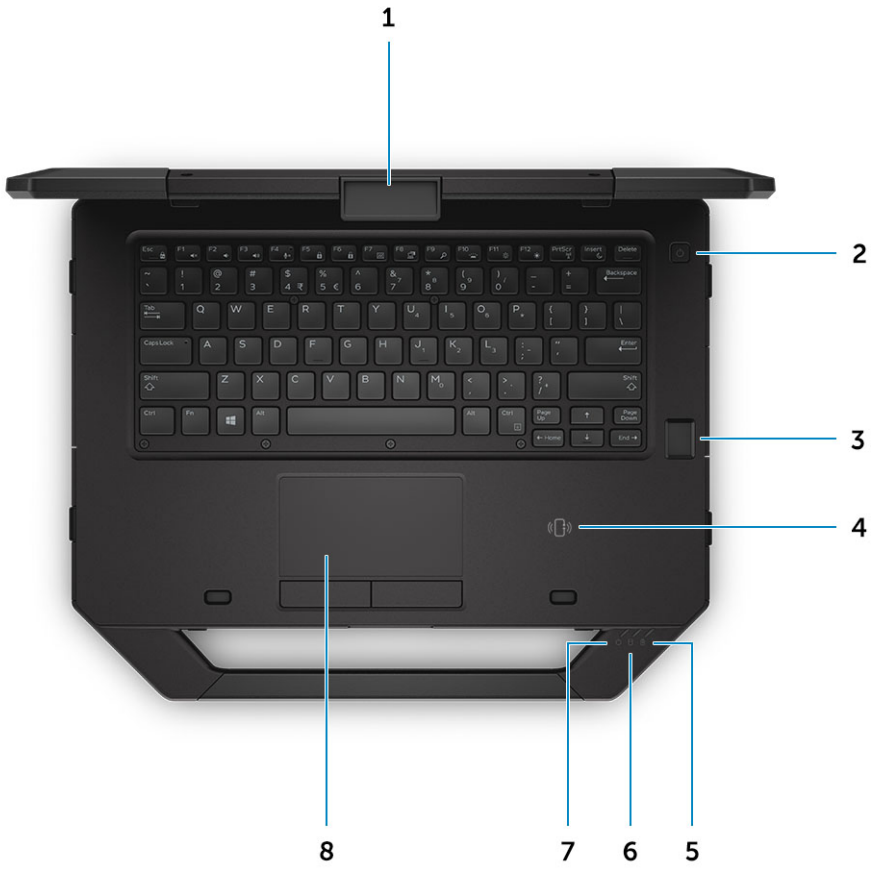


Figure 1. System top view

1. display latch
2. power button
3. fingerprint reader (optional)
4. Near Field Communication (NFC)
5. battery status light
6. hard drive status light
7. power status light
8. touchpad

Figure 2. System front view

1. microphone
2. privacy shutter (optional)
3. camera (optional)
4. camera status light (optional)
5. microphone
6. outdoor readable display/touchscreen
7. speaker
8. handle

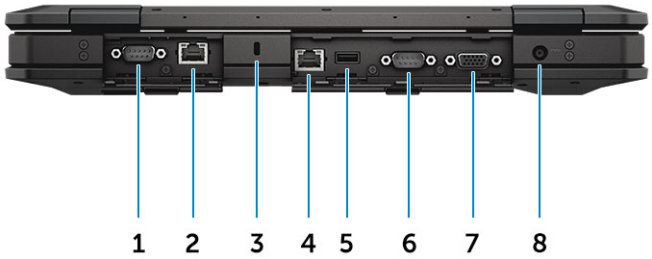


Figure 3. System back view

1. serial port
2. network port
3. security cable slot
4. network port
5. USB 2.0 port
6. serial port
7. VGA port
8. power connector

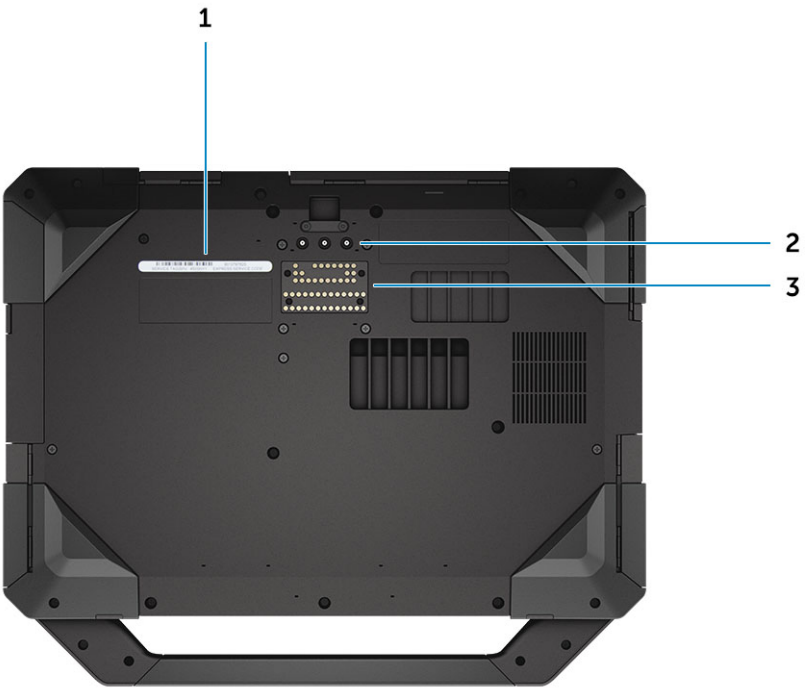


Figure 4. System lower view

1. service tag
2. radio frequency pass-through connectors
3. docking device connector

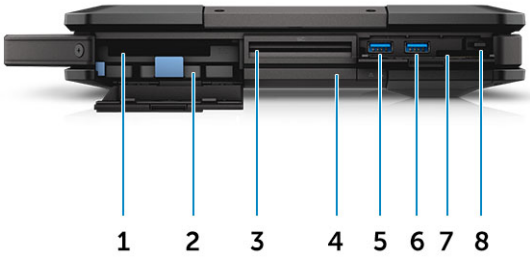


Figure 5. System side view — right

1. PCMCIA/ExpressCard reader (optional)
2. hard drive
3. Smart card reader (optional)
4. optical disk drive (optional)/hot-swap bridge battery (optional)
5. USB 3.0 port
6. USB 3.0 port
7. SD card reader
8. stylus

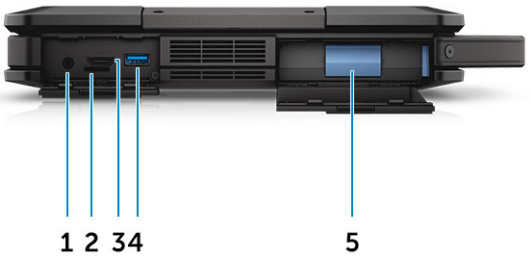


Figure 6. system side view — left

1. audio port
2. SIM card slot
3. HDMI port
4. USB 3.0 port with PowerShare
5. battery

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

3

Disassembly and reassembly

Topics:

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Hex screwdriver
- Small plastic scribe

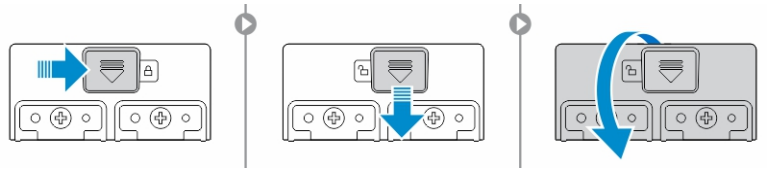
Press latch doors

Opening the press latch doors

The computer includes six press latch doors:

- Three on the back of the computer
- Two on the right side of the computer
- One on the left side of the computer

1. Slide the latch until the unlock icon is visible.
2. Press the latch and open the press latch door in the downward direction.

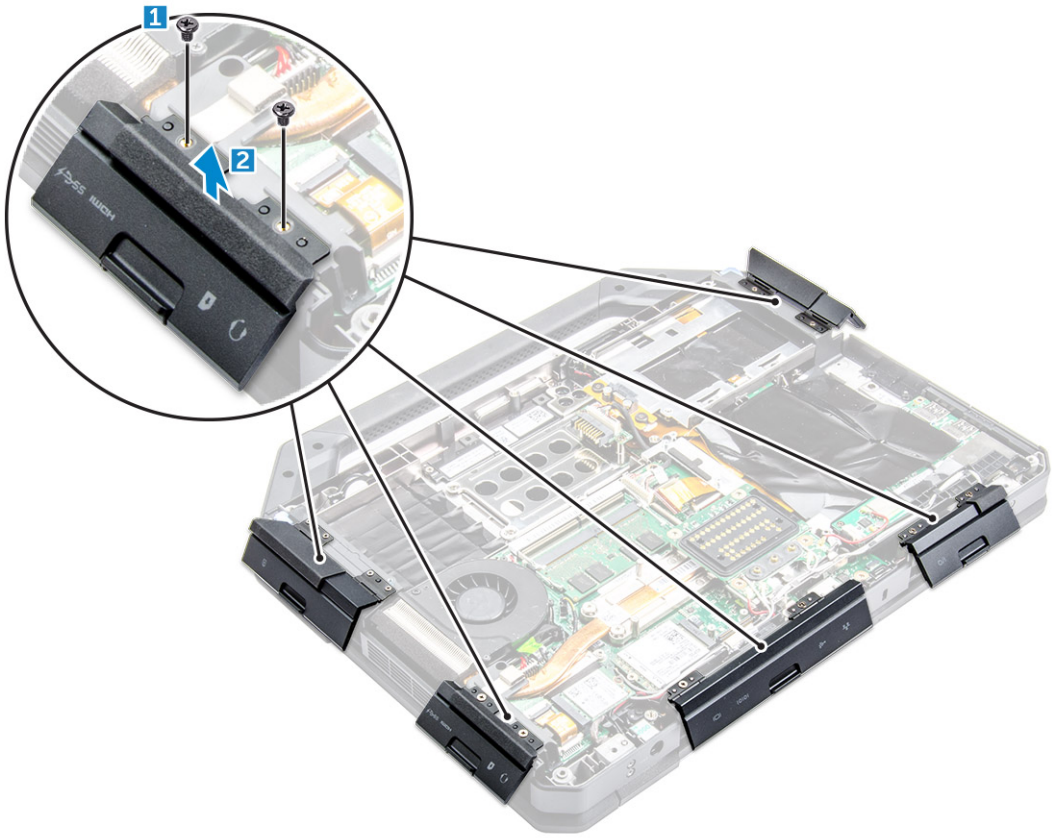


Closing the press latch doors

1. Close the latch door back by pressing it toward the computer.
2. To lock the latch doors, slide the latch until the lock icon is visible.

Removing the press latch doors

Remove the screws that secure the press-latch door and lift it from the computer



[1,2].

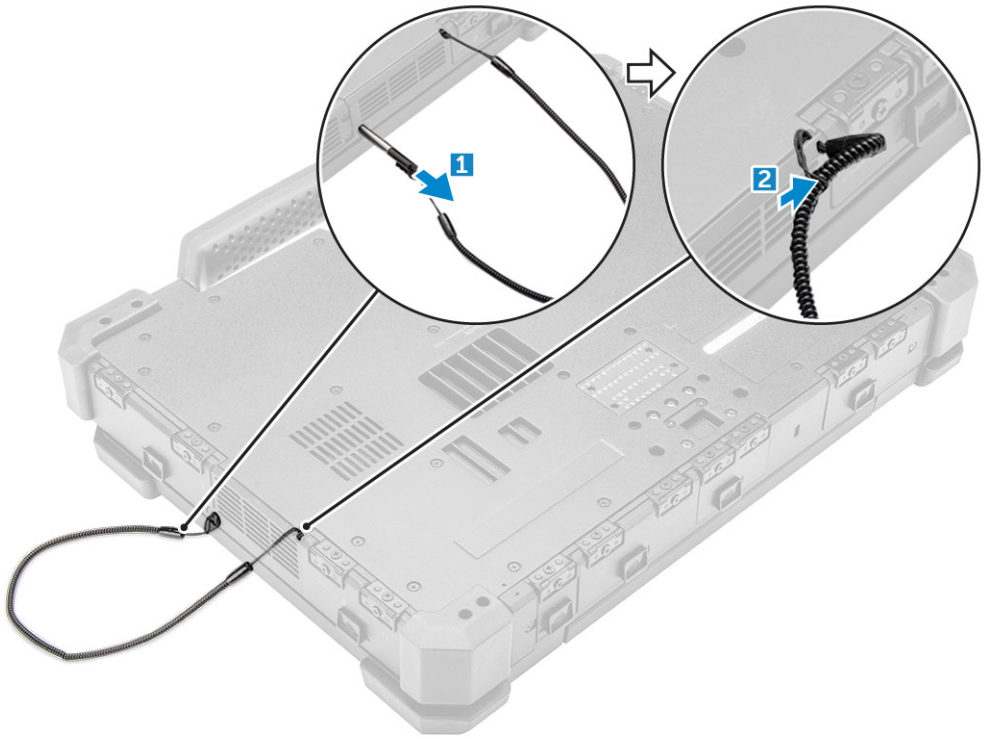
Installing the press latch doors

1. Align the press latch door with the screw holes on the computer.
2. Tighten the screws to secure the press latch door.

Stylus and tether

Removing the stylus and tether

1. Pull the stylus out from the slot on the computer [1].
2. Release and remove the tether from the computer [2].



Installing the stylus and tether

1. Install the tether to the computer.
2. Insert the stylus into the slot and push it inwards.

Battery

Your system ships with a non-hot swappable battery. You also have an option to select a hot swap battery.

NOTE: The battery is a FRU.

To check if your battery is a hot swap battery, go to **System Setup** > **General** > **System Information** screen. The battery is not a customer replaceable part. If the hot swap battery is installed, the optical drive is removed.

Hot swap battery

This section explains what happens when you swap the battery.

The BIOS allows 1 minute to swap the hot swap battery if there is sufficient charge and the temperature is 0º–60º C. When swapping the battery, the LCD, backlight and all LEDs turn off and the processor enters a low power state to reduce system power. The battery LED flashes green/amber (once per second) for the first 45 seconds. For the last 15 seconds, the green/amber flashes at a faster rate to indicate that the swap time limit is near. If the 1-minute time is exceeded, the unit attempts to enter the Sleep (S3) state. If the user has disabled S3 or the OS fails to enter S3 entering Sleep is not guaranteed. When the

system enters the sleep (S3) state, the battery LED continues to flash green/amber at the faster rate to indicate to the user that a power source needs to be installed.

If the hot swap battery is not charged to a sufficient level or the temperature is outside the mentioned range and the user performs a hot swap, the BIOS puts the system into the Sleep (S3) state and flashes the battery LED at a faster green/amber rate.

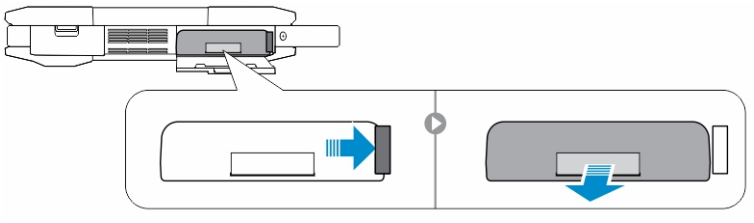
Removing the battery

WARNING: Using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell. The battery is designed to work with your Dell computer. Do not use a battery from any other computer with your computer.

WARNING: Before removing or replacing the battery, turn off the computer, disconnect the AC adapter from the electrical outlet and the computer, disconnect the modem from the wall connector and computer, and remove any other external cables from the computer.

WARNING: Not for use in hazardous locations. See installation instructions.

1. Follow the procedure in Before Working Inside Your Computer.
2. Push and hold the battery release button to the right while pulling on the plastic battery tab.



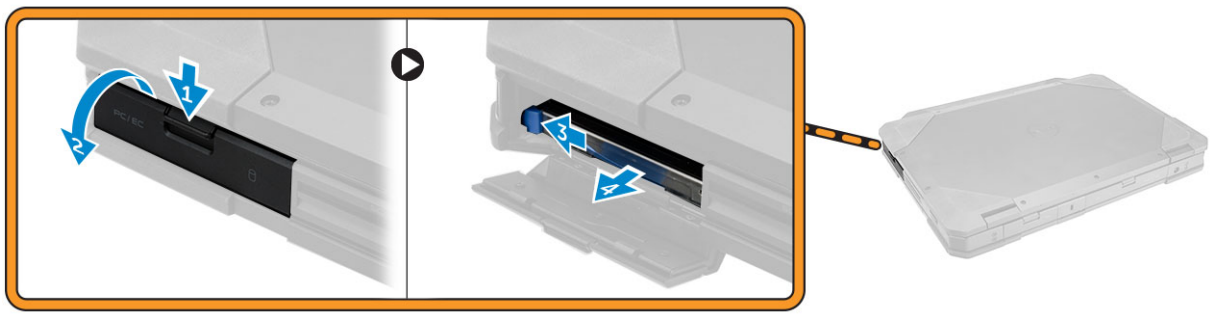
Installing the battery

1. Slide the battery into the slot until it clicks into place.
2. Press firmly on the door until a click is heard and the latch is engaged.
3. Follow the procedure in After working inside your computer.

Hard drive

Removing the hard drive

1. Follow the procedure in Before working inside your computer
2. Remove the battery.
3. To remove the hard drive:
   a. Unlock the hard drive press latch door [1].
   b. Push it downwards to open it [2].
   c. Push and hold the hard drive release button to the left while pulling on the plastic hard drive tab [3].
   d. Pull the hard drive away from the computer [4].



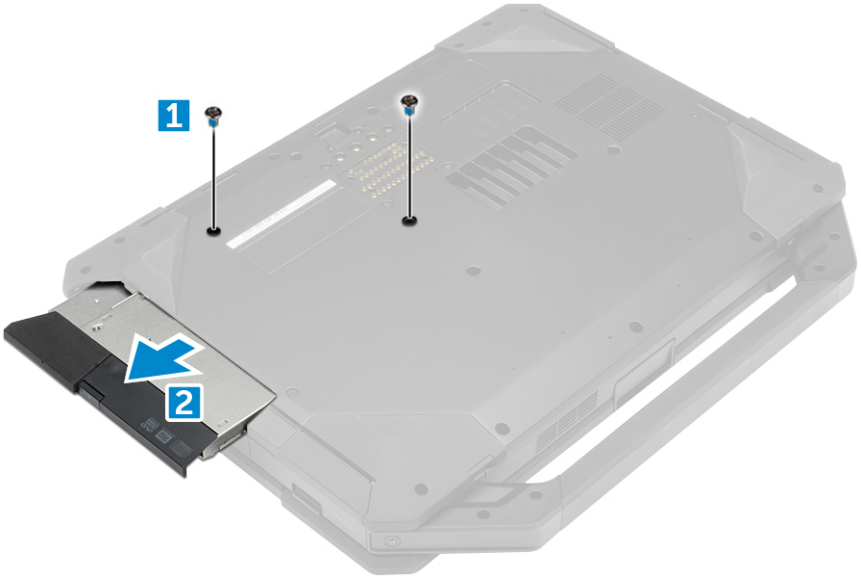
Installing the hard drive

1. Slide the hard drive into the slot on the computer.
2. Close the hard drive bay press latch door.
3. Install the battery.
4. Follow the procedure in After working inside your computer.

Optical drive

Removing the optical drive

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
3. To remove the optical drive:
   a. Remove the screws that secure the optical drive to the computer [1].
   b. Remove the optical drive from the computer [2].



Installing the optical drive

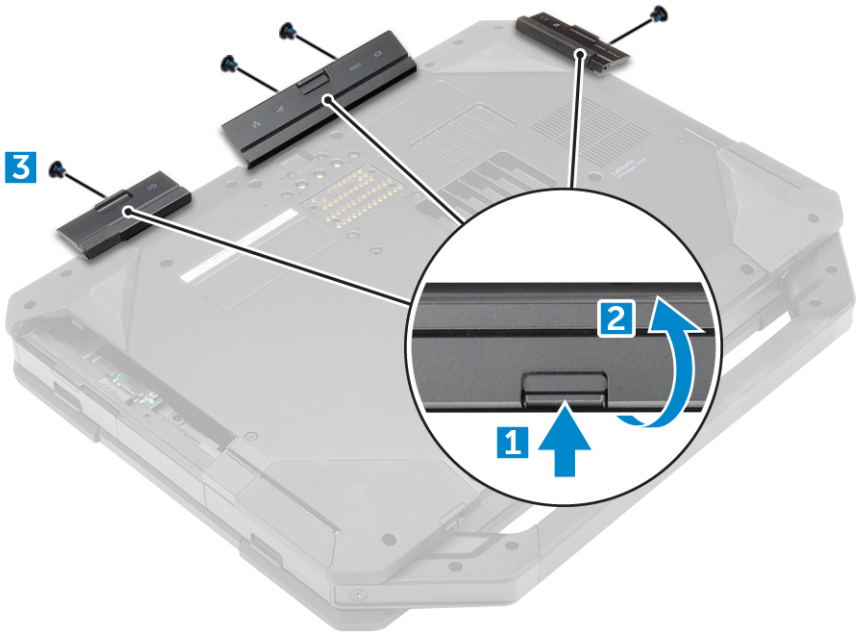
1. Insert the optical drive into the slot on the computer.
2. Tighten the screws to secure the optical drive to the computer.

3. Install:
   a. hard drive
   b. battery
4. Follow the procedure in After working inside your computer.

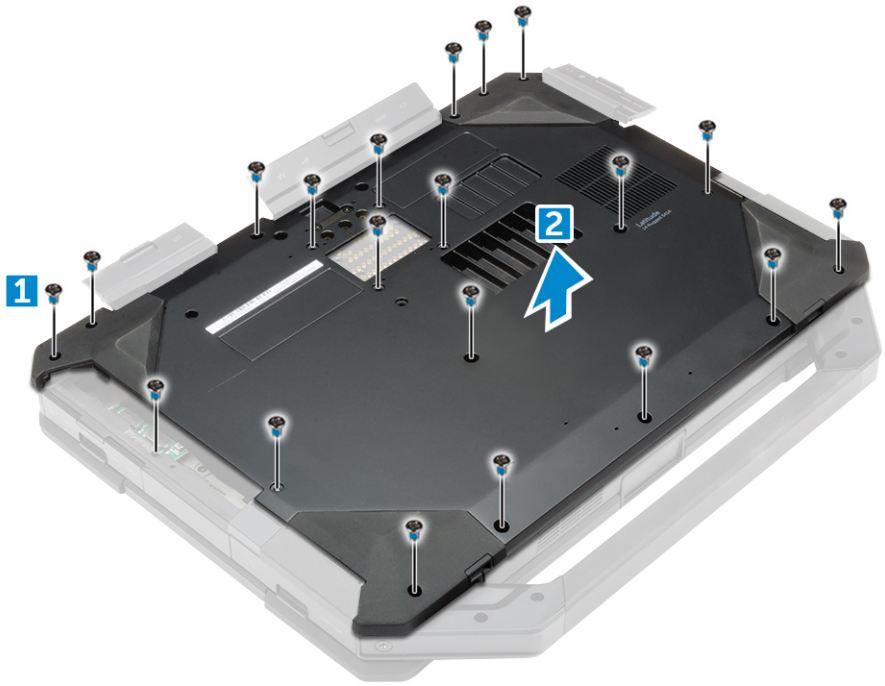
Base cover

Removing the base cover

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
3. To release the base cover:
   a. Unlock the I/O latch door [1].
   b. Lift the latch door to open it [3].
   c. Remove the screws that secure the base cover to the computer [3].



4. To remove the base cover:
   a. Remove the screws that secure the base cover [1].
   b. Lift the base cover away from the computer [2].



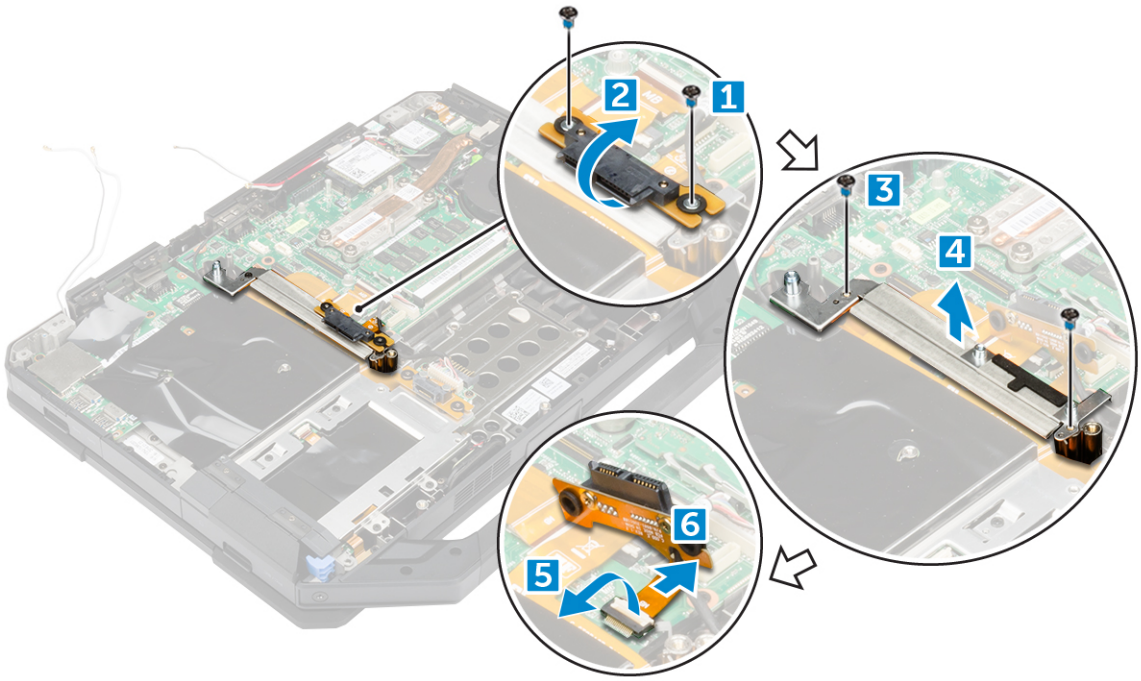
Installing the base cover

1. Tighten the screws to secure I/O, back door, and HDMI to the computer chassis.
2. Press firmly on the latch doors until a click is heard and the latch is engaged.
3. Place the base cover on the base of the computer.
4. Tighten the screws to secure the base cover to the computer chassis.
5. Install the:
   a. optical drive
   b. hard drive
   c. battery
6. Follow the procedure in After working inside your computer.

Optical drive connector

Removing the optical drive connector

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To release the optical drive connector:
   a. Remove the screws that secure the optical drive connector to the computer [1].
   b. Flip the connector [2].
   c. Remove the screws that secure the connector to the computer [3].
   d. Lift the connector in an upward direction [4].
   e. Lift the latch [5] and disconnect the optical drive connector cable from the connector on the system board [6].



4. Lift the optical drive connector away form the computer.

Installing the optical drive connector

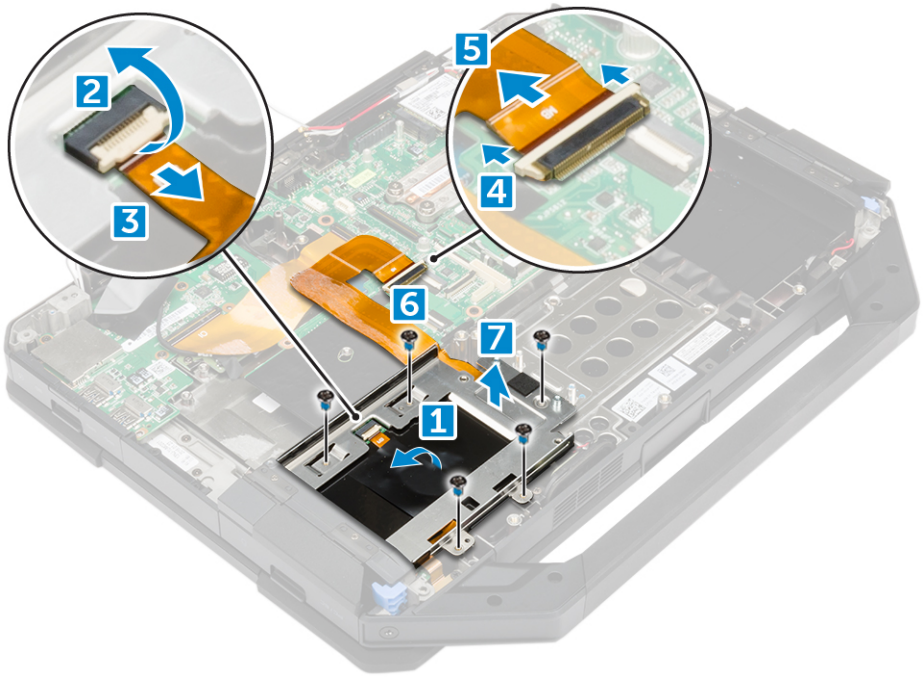
1. Place the optical drive on to the computer.
2. Connect the optical drive connector cable.
3. Press the locking tab.
4. Tighten the screws that secure the optical drive connector to the computer.
5. Flip the optical drive connector and seat it.
6. Tighten the screws to secure the optical drive connector to the computer.
7. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
8. Follow the procedure in After working inside your computer.

Hard drive tray

Removing the hard drive tray

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the hard drive tray:
   a. Peel the adhesive tape [1].
   b. Lift the latch [2] and disconnect the hard drive cable from the connector [3].
   c. Lift the latch [4] and disconnect the system board cable from the connector [5].

d. Remove the screws that secure the hard drive tray to the computer [6].
e. Lift the hard drive tray away from the computer [7].



Installing the hard drive tray

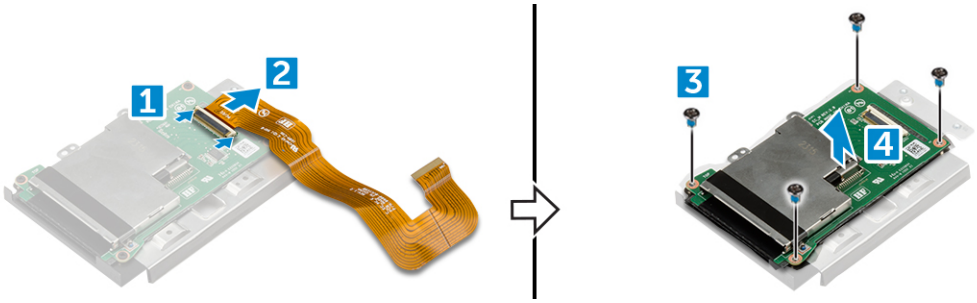
1. Place the hard drive tray on the computer.
2. Tighten the screws to secure the hard drive tray to the computer.
3. Connect the system board cable to the connector.
4. Connect the hard drive cable to the connector.
5. Fix the adhesive tape.
6. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
7. Follow the procedure in After working inside your computer.

Smart card module

Removing the Smart card board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. hard drive tray
3. To remove the Smart card board:
   a. Lift the latch [2] and disconnect the cable from the connector [3].
   b. Remove the screws that secure the Smart card board [6].

c. Lift the Smart card board away from the assembly [7].



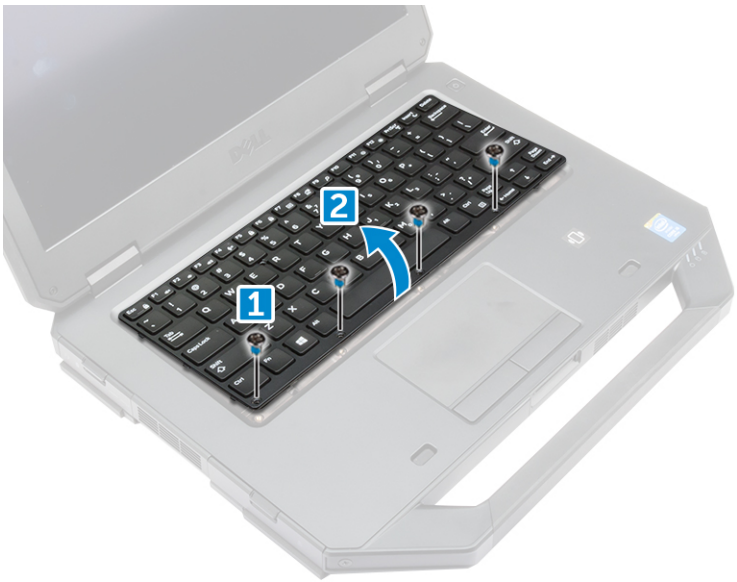
Installing the Smart card board

1. Place the Smart card board on the assembly.
2. Tighten the screws to secure the Smart card board to the assembly.
3. Connect the cable to the connector.
4. Install the:
   a. hard drive tray
   b. base cover
   c. optical drive
   d. hard drive
   e. battery
5. Follow the procedure in After working inside your computer.

Keyboard lattice and Keyboard

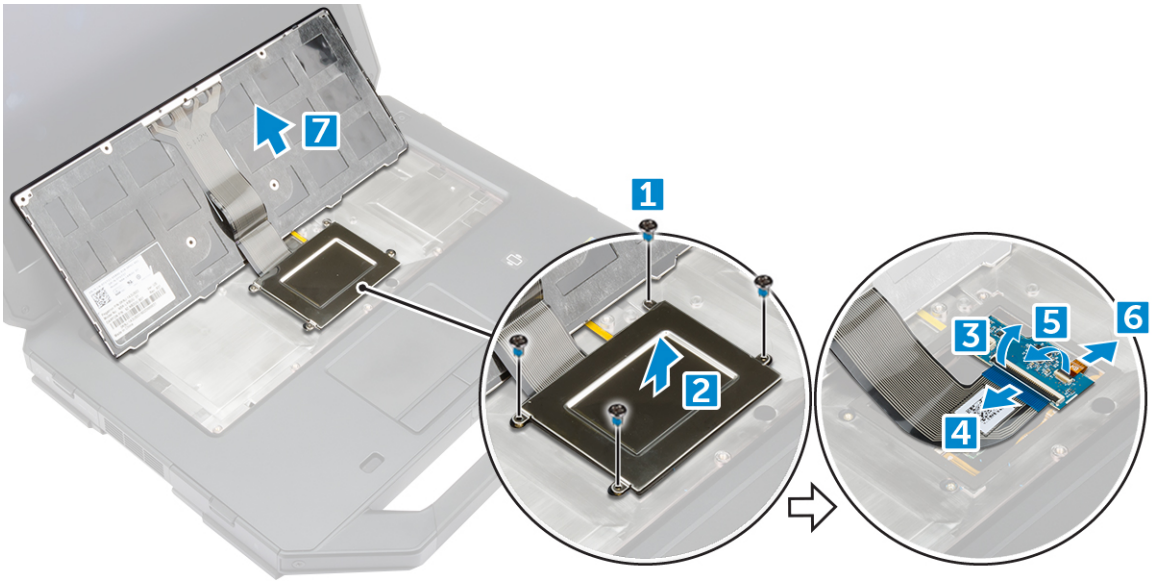
Removing the keyboard

1. Follow the procedure in Before working inside your computer.
2. Remove the battery.
3. To release the keyboard:
   a. Remove the screws that secure the keyboard to the computer chassis [1].
   b. Pry along the edges and flip the keyboard over the display [2].



4. To remove the keyboard:

a. Remove the screws that secure the keyboard door [1].
b. Lift the keyboard door away from the computer [2].
c. Release the latches [3, 5] and disconnect the keyboard cables from the connectors on the system board [4, 6].
d. Lift the keyboard away from the computer [7].



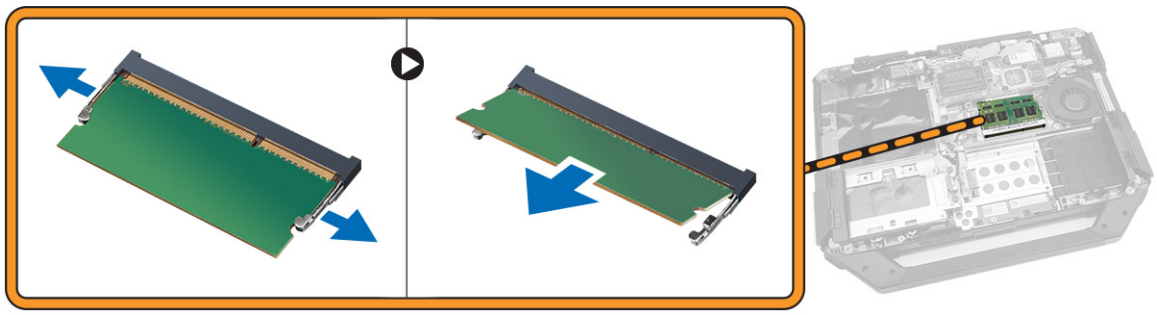
Installing the keyboard

1. Connect the keyboard cables to the connectors on the system board.
2. Place the keyboard door over its slot on the computer.
3. Tighten the screws that secure the keyboard door to the computer.
4. Align the keyboard into the slot on the computer.
5. Tighten the screws to secure the keyboard to the computer.
6. Install the battery.
7. Follow the procedure in After Working Inside Your computer.

Memory modules

Removing the memory module

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base Cover
3. Pry the securing clips away from the memory module until it pops up.
4. Remove the memory module from the socket on the system board.



Installing the memory module

1. Insert the memory module into the memory connector.
2. Press the memory module down until it clicks into place.
3. Install:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
4. Follow the procedure in After working inside your computer.

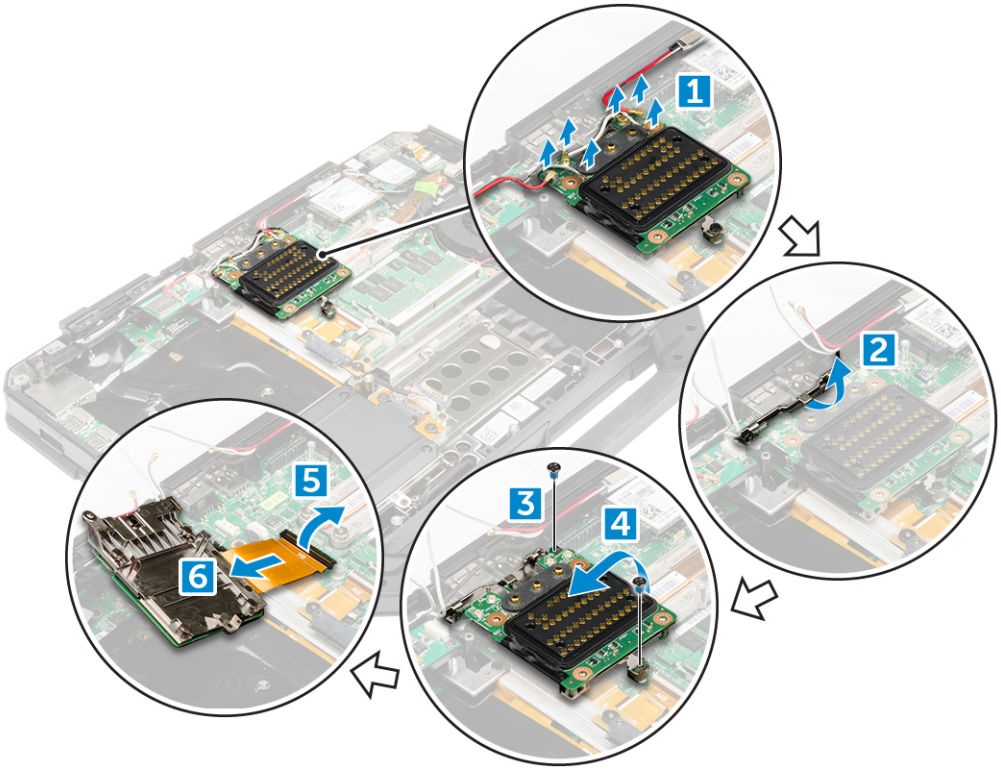
Chasis Frame

Removing the docking board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. base cover
3. To remove the docking board:
   a. Disconnect the antenna cables from the docking board [1].

      CAUTION: Exercise caution while disconnecting the antenna cables. Improper removal may result in damage/breakage of the antenna cables.

   b. Unroute the antenna cables [2].
   c. Remove the screws that secure the docking board to the computer [3].
   d. Flip the docking board [4].
   e. Lift the release tab [5].
   f. Disconnect the docking board connector cable from the system board [6].



4. Lift and remove the docking board from the computer chassis.

Installing the docking board

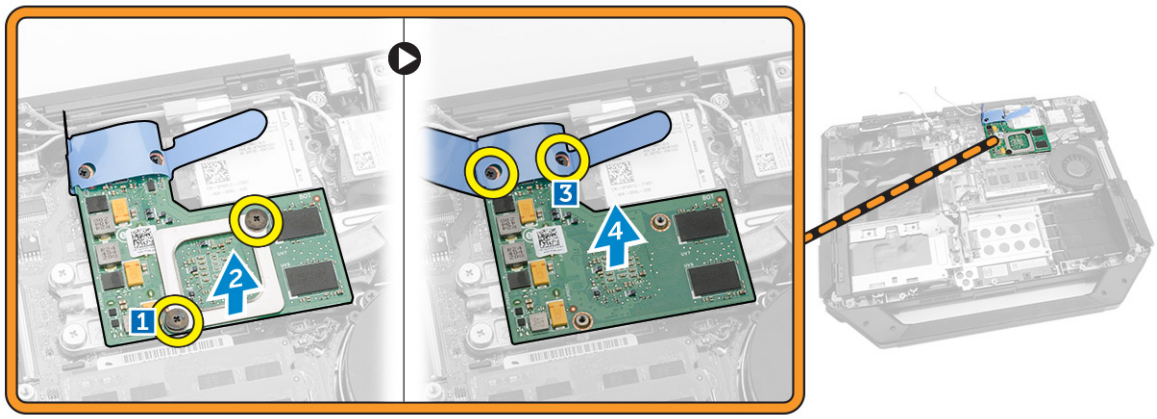
1. Connect the docking board connector cable to the system board.
2. Place the docking board on the slot.
3. Tighten the screws to secure the docking board to the computer.
4. Route the antenna cables.
5. Connect the antenna cables to the docking board.
6. Install the:
   a. base cover
   b. battery
7. Follow the procedure in After working inside your computer.

Graphics Processing Unit (GPU)

Removing the GPU board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. docking board
3. To remove the GPU board
   a. Remove the screws that secure the GPU socket to the computer [1].
   b. Lift the GPU socket from the board [2].
   c. Remove the screws that secure the pull tab to the GPU board [3].

d. Lift the GPU board from the computer [4].



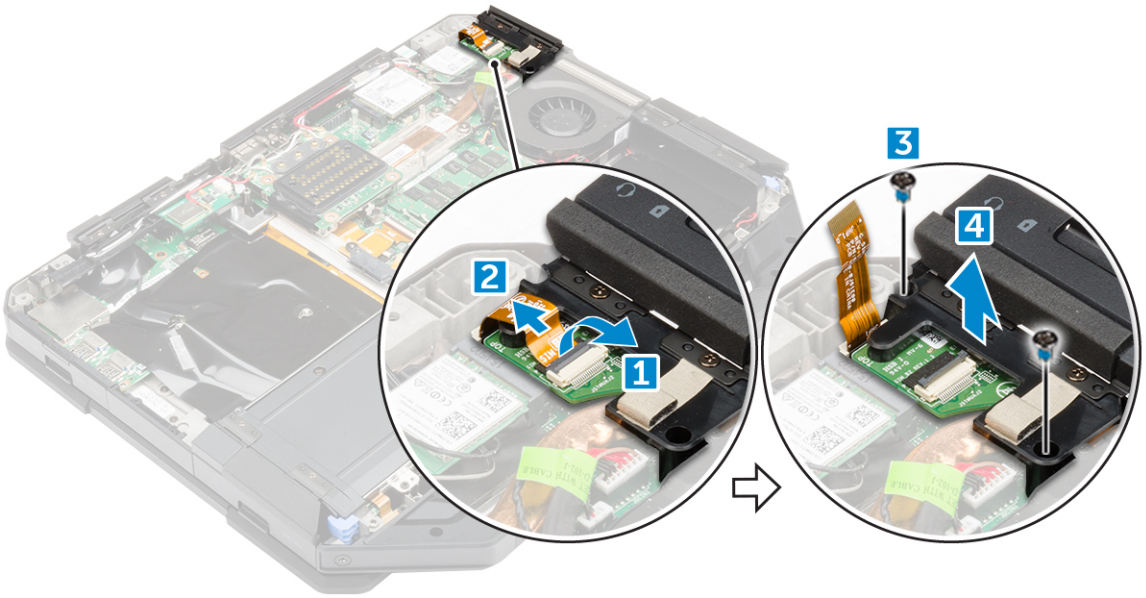
Installing the GPU board

1. Place the GPU board on the computer.
2. Tighten the screws to secure the pull tab to the GPU board.
3. Place the GPU socket on the board.
4. Tighten the screws to secure the socket to the computer.
5. Install the:
   a. docking board
   b. base cover
   c. optical drive
   d. hard drive
   e. battery
6. Follow the procedure in After working inside your computer.

Subscriber Identity Module(SIM) board

Removing the SIM module

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the SIM module:
   a. Lift the latch [1] and disconnect the SIM module cable [2].
   b. Remove the screws that secure the SIM module to the computer [3].
   c. Remove the SIM module from the computer [4].



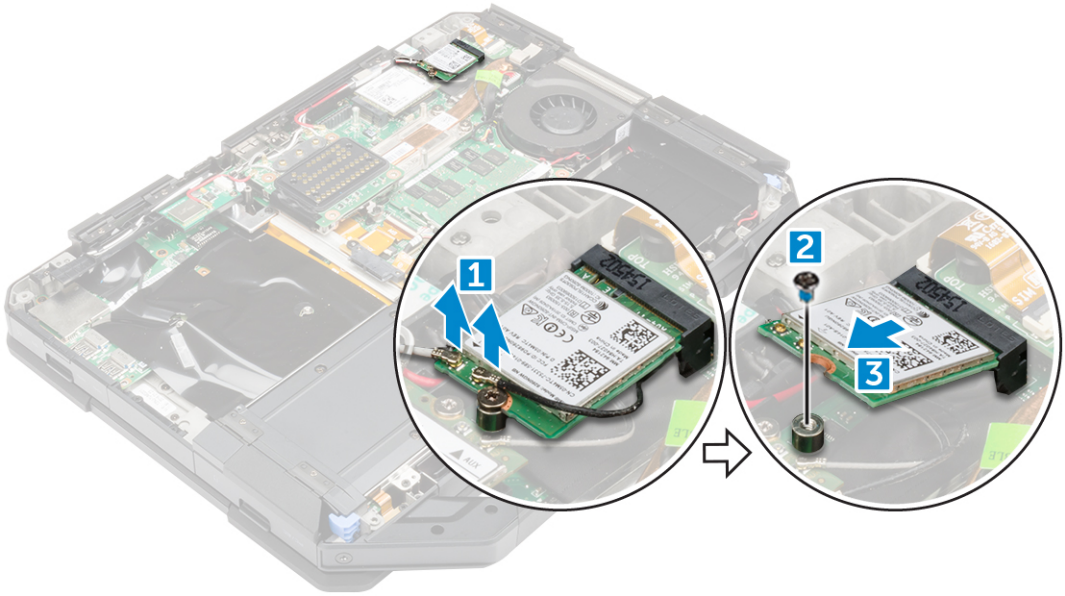
Installing the SIM module

1. Slide the SIM module into the slot on the computer.
2. Tighten the screws to secure the SIM module to the computer.
3. Connect the SIM module cable to the connector.
4. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
5. Follow the procedure in After working inside your computer.

WLAN card

Removing the WLAN card

1. Follow the procedure in Before working inside your computer.
2. Remove:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the WLAN card:
   a. Disconnect the antenna cables from the WLAN card [1].
   b. Remove the screw that secures the WLAN card [2].
   c. Slide and lift the WLAN card from the slot [3].



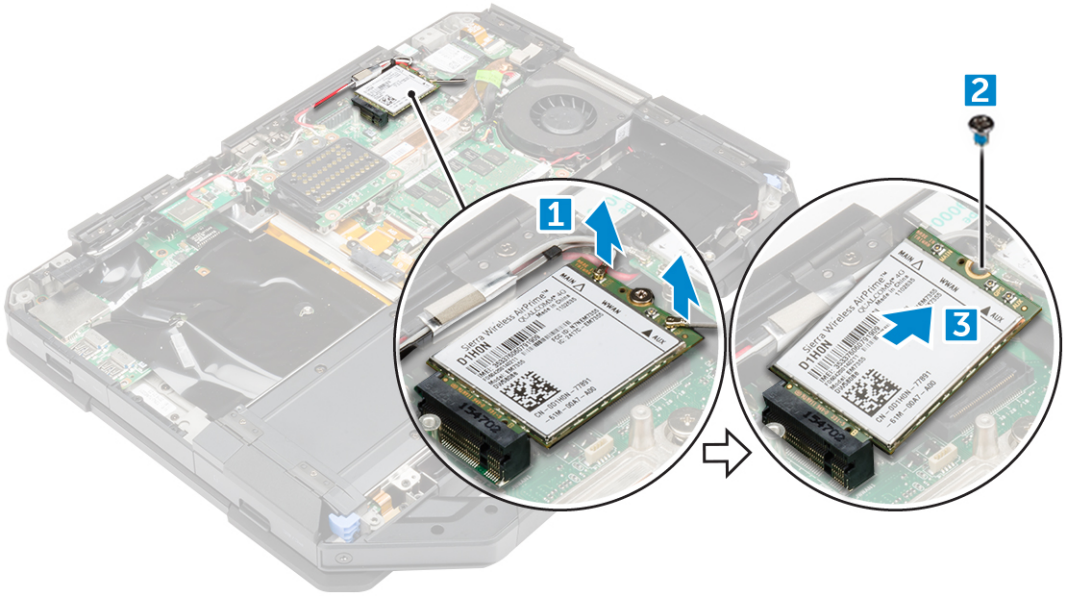
Installing the WLAN card

1. Insert the WLAN card into the slot on the system board.
2. Tighten the screw to secures the cable holder.
3. Connect the antenna cables to the WLAN card.
4. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
5. Follow the procedure in After working inside your computer.

WWAN card

Removing the WWAN card

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the WWAN card:
   a. Disconnect the cables from the WWAN card [1].
   b. Remove the screw that secures the WWAN card [2].
   c. Slide and lift the WWAN card away from the slot [3].



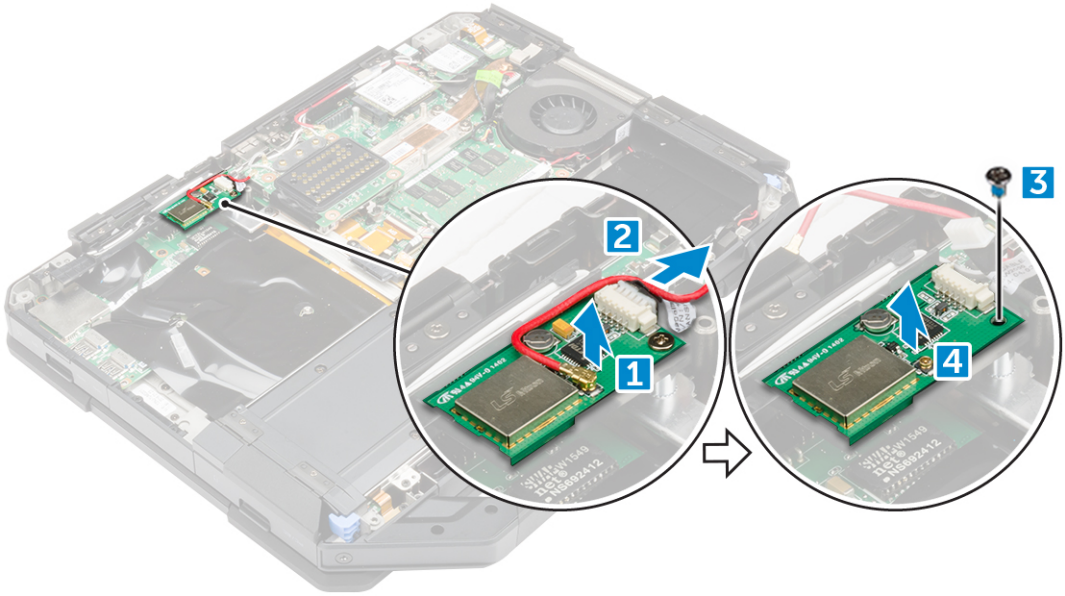
Installing the WWAN card

1. Insert the WWAN card into the slot on the system board.
2. Tighten the screw to secure the WWAN card to the computer.
3. Connect the antenna cables to the WWAN card.
4. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
5. Follow the procedure in After working inside your computer.

GPS board

Removing the GPS board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the GPS board:
   a. Disconnect the antenna cable from the GPS board [1].
   b. Disconnect the GPS board cable from the connector [2].
   c. Remove the screw that secures the GPS board to the computer [3].
   d. Lift the GPS board away from the computer [4].



Installing the GPS board

1. Place the GPS board into the slot on the computer.
2. Tighten the screw to secure the GPS board to the computer.
3. Connect the antenna cable to the connector on the GPS board.
4. Connect the GPS board cable to the connector.
5. Install:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
6. Follow the procedure in After working inside your computer.

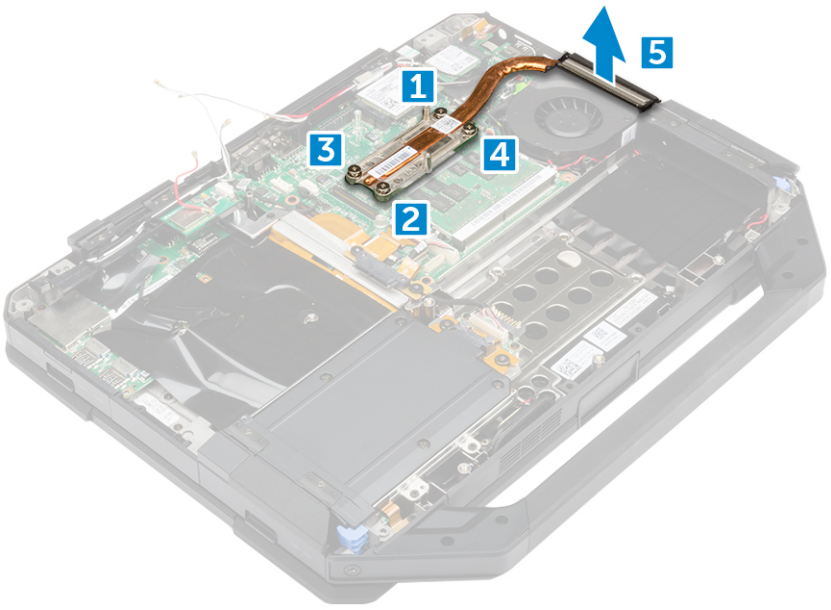
Heat sink

Removing the heatsink

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. docking board
   f. GPU board
   g. SIM module
3. To remove the heatsink:
   a. Loosen the screws that secure the heatsink to the system board [1, 2, 3, 4].

      NOTE: Loosen the screws in the order of the callout numbers [1, 2, 3, 4]. These screws are retention screws and cannot be fully removed.

   b. Lift and remove the heatsink from the computer.



Installing the heatsink

1. Align the heatsink with the system board.
2. Tighten the screws to secure the heatsink to the system board.

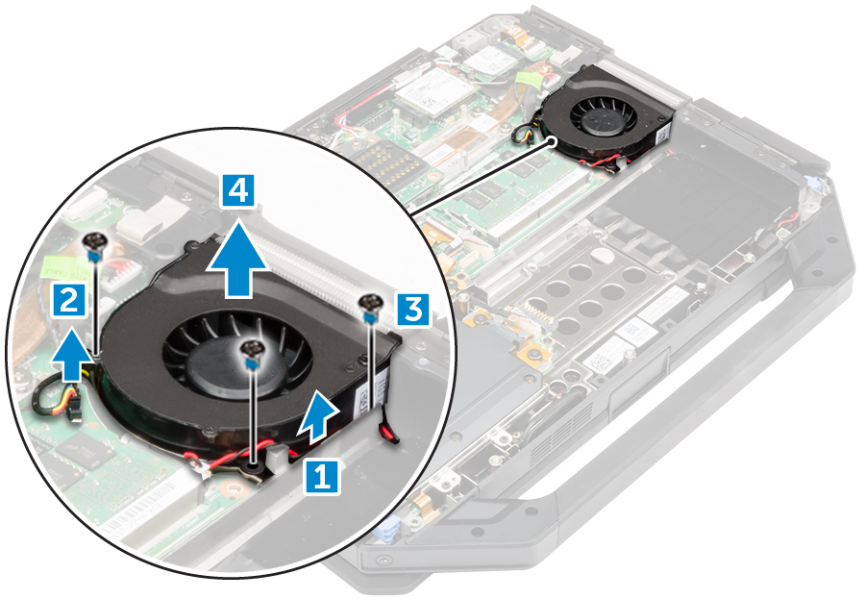
   NOTE: Secure the screws in the order of the callout numbers [1, 2, 3, 4].

3. Install the:
   a. SIM module
   b. GPU board
   c. docking board
   d. base cover
   e. optical drive
   f. hard drive
   g. battery
4. Follow the procedure in After working inside your computer.

System fan

Removing the system fan

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the system fan:
   a. Unroute the system fan cable [1].
   b. Disconnect the system fan cable [2].
   c. Remove the screw that secures the system fan to the computer [3].
   d. Lift the system fan away from the computer [4].



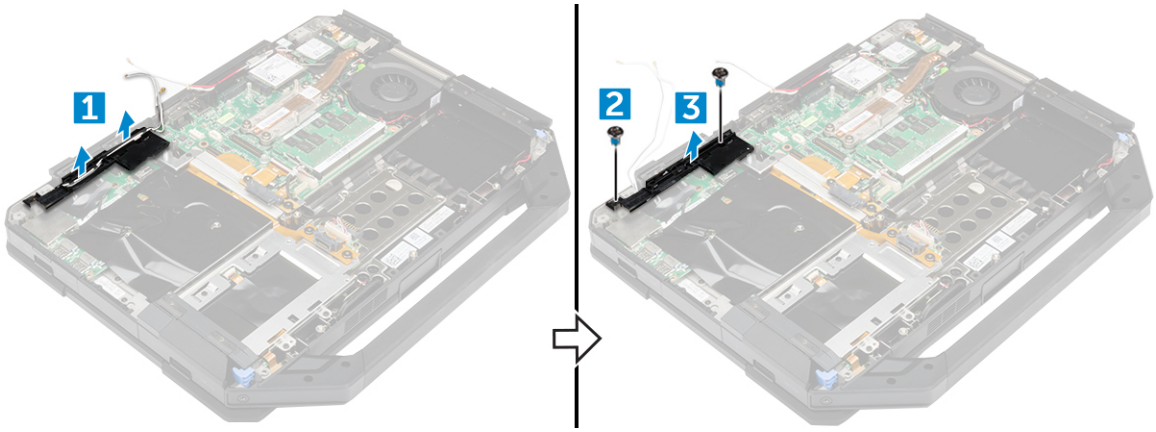
Installing the system fan

1. Place the system fan into the slot on the computer chassis.
2. Tighten the screw to secure the system fan to the computer
3. Connect the system fan cable to the computer.
4. Route the system fan cable.
5. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
6. Follow the procedure in After working inside your computer.

RF cable holder

Removing the RF holder

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. GPS board
   f. WLAN card
   g. docking board
3. To remove the RF holder:
   a. Unroute the antenna cables from the cable routing clips [1].
   b. Remove the screw that secures the RF holder to the computer [2] .
   c. Lift and remove the RF holder from the computer [3] .



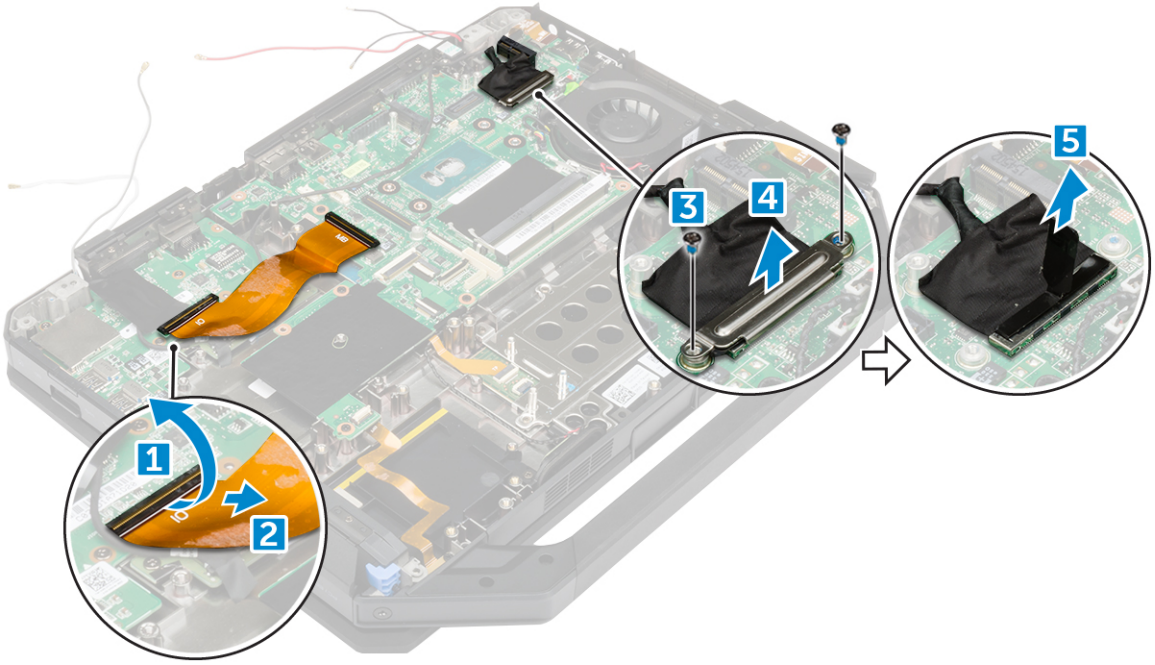
Installing the RF holder

1. Place the RF holder on the computer.
2. Install the screws that secure the RF holder to the computer.
3. Connect the antenna cables.
4. Route the antenna cables.
5. Install the:
   a. docking board
   b. WLAN card
   c. GPS board
   d. base cover
   e. optical drive
   f. hard drive
   g. battery
6. Follow the procedure in After working inside your computer.

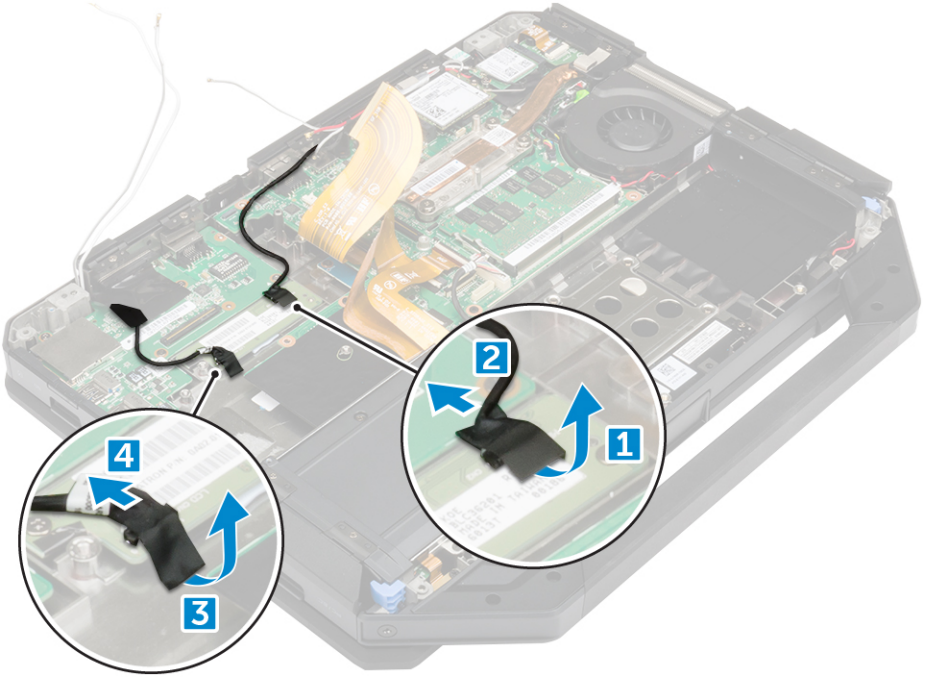
Display assembly

Removing the display assembly

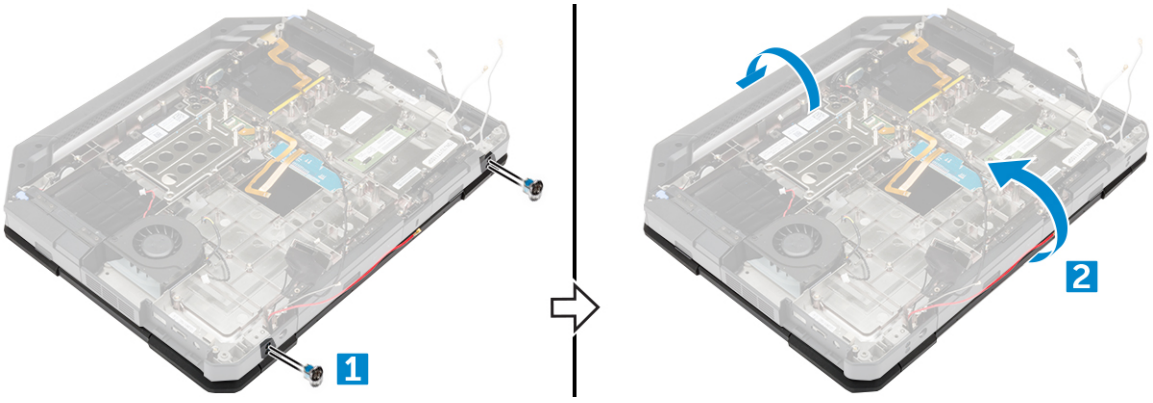
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To release the display assembly:
   a. Lift the latch [1] and disconnect the I/O cable from the connector on the system board [2].
   b. Remove the screws that secure the metal tab [3].
   c. Lift the metal tab to access the eDP cable [4].
   d. Disconnect the eDP cable on the system board [4].



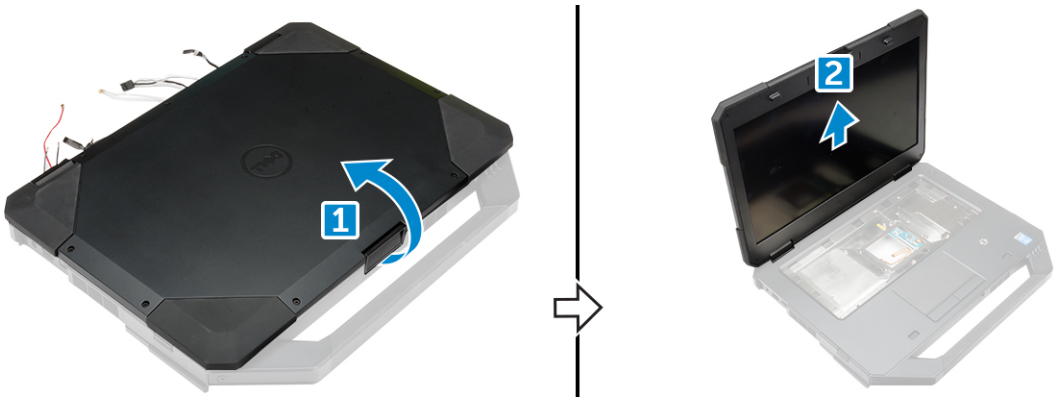
4. Peel the adhesive tape [1] [3] and disconnect the display cables from the connectors [2] [4].



5. Remove the screws that secure the display assembly [1] and flip the computer [2].



6. Open the display and lift the display assembly away from the computer.



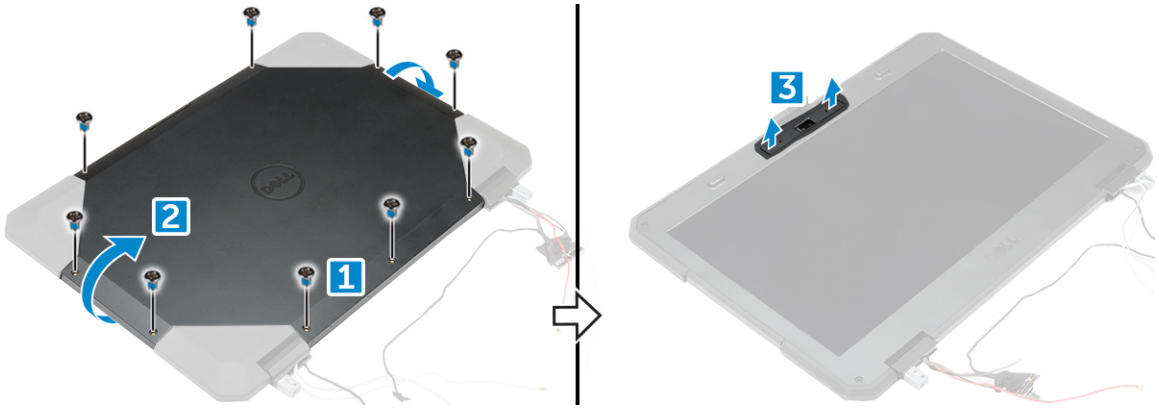
Installing the display assembly

1. Place the display assembly and close the display.
2. Flip the computer.
3. Tighten the screws to secure the display assembly to the computer.
4. Connect the display assembly connector.
5. Connect the eDP and display assembly cables on the system board.
6. Affix the adhesive tapes.
7. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
8. Follow the procedure in After working inside your computer.

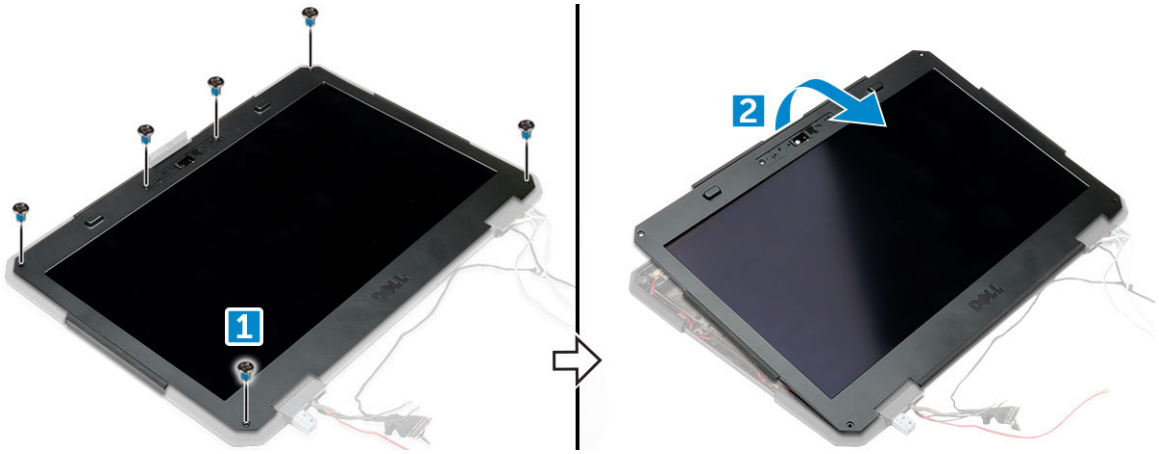
Display panel

Removing the display

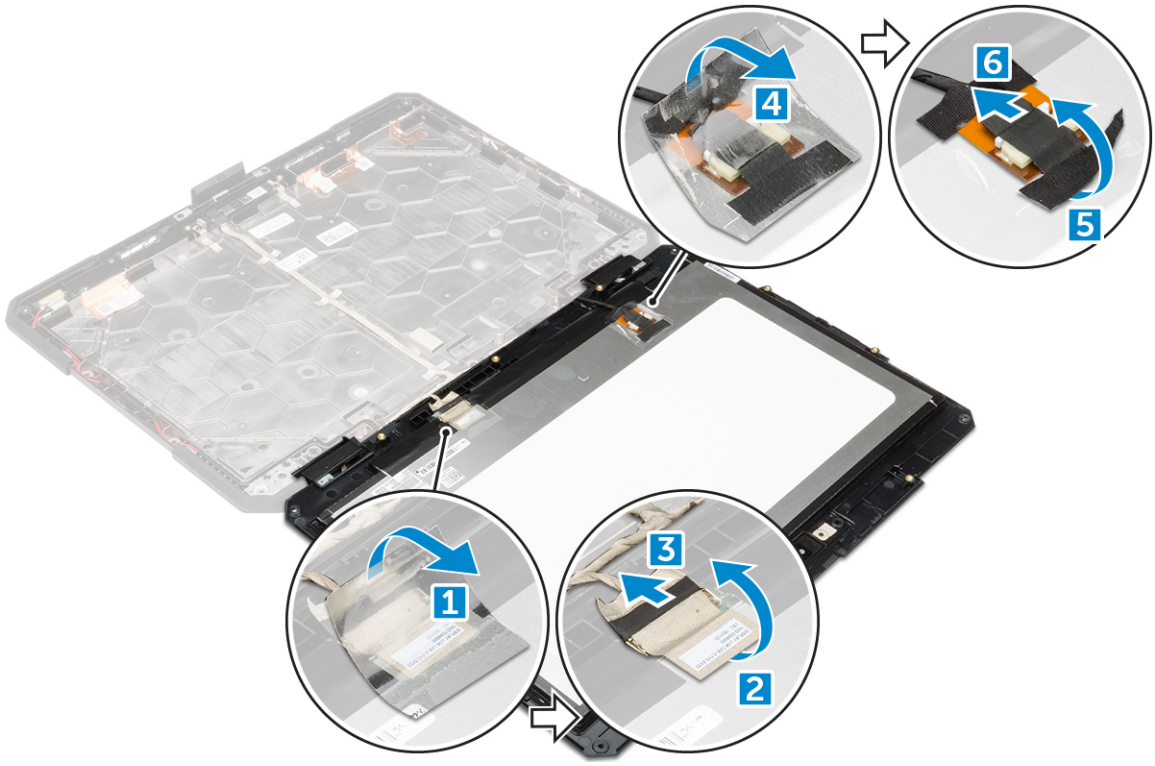
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. display assembly
3. To release the display assembly:
   a. Remove the screws that secure the display to the display assembly [1].
   b. Flip the display assembly [2].
   c. Remove the plastic tab from the display assembly [3].



4. To remove the display:
   a. Remove the screws that secure the display to the display assembly [1].
   b. Release the display from the display assembly [2].
   c. Lift the display towards the front to access the display cables [3].



5. Peel the adhesive tapes [1] [2] [4] [5] and disconnect the display cables from the connectors [3] [6].



Installing the display

1. Connect the display cables to the connectors and fix the adhesive tapes.
2. Replace the display until it clicks in the display assembly.
3. Tighten the screws to secure the display to the display assembly.
4. Place the plastic tab to secure it in the display assembly.
5. Flip the display assembly.
6. Tighten the screws to secure the display to the display assembly.
7. Install the:
   a. display assembly
   b. base cover
   c. optical drive
   d. hard drive
   e. battery
8. Follow the procedure in After working inside your computer.

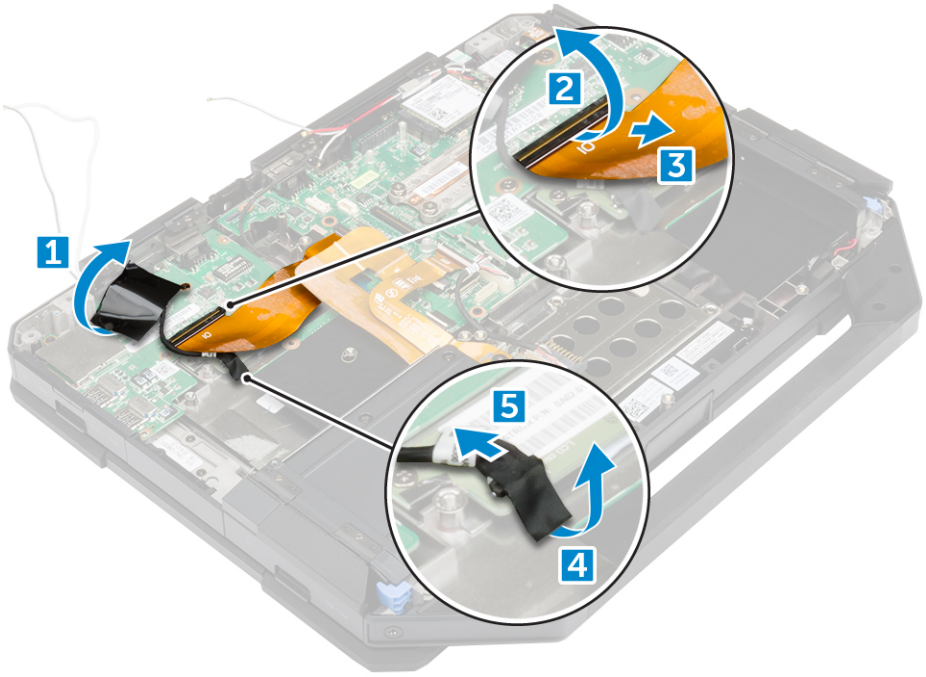
Input-Output board

Removing the I/O board

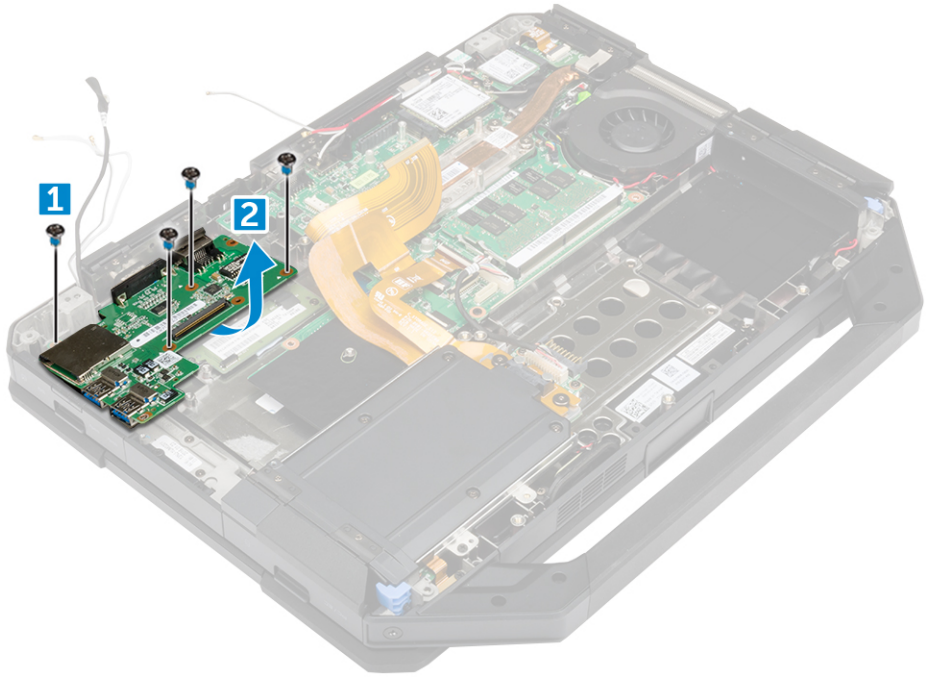
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To access the I/O board:
   a. Release the latch door and remove the epoxy screws [1].
   b. Peel the adhesive tape [2].

4. To release the I/O board:
   a. Peel the adhesive tape [1].

b. Lift the latch [1] and disconnect the I/O board cable from the connector [2].
c. Peel the adhesive tape [4] and disconnect the display cable [5].



5. To remove the I/O board:
   a. Remove the screws that secure the I/O board to the computer [1].
   b. Lift the I/O board away from the computer [2].



Installing the I/O board

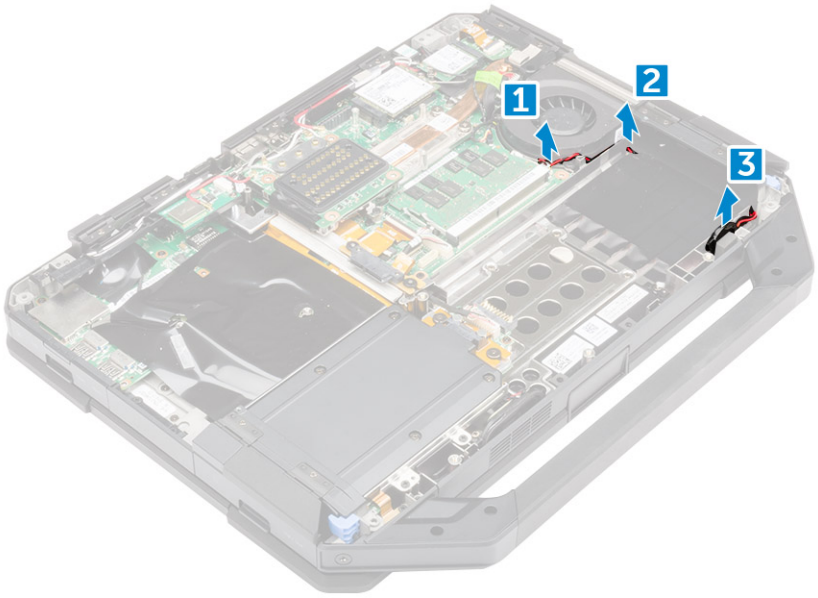
1. Place the I/O board on the computer.
2. Tighten the epoxy screws to secure the I/O board to the computer.
3. Connect the display assembly cable to the computer.
4. Connect the I/O cable to the computer.
5. Tighten the screw to secures the I/O board.

6. Slide the I/O board into its place on the computer.
7. Close the I/O bay press latch door.
8. Install:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery
9. Follow the procedure in After working inside your computer.

Coin cell battery

Removing the coin cell battery

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the coin cell battery:
   a. Disconnect the coin cell battery cable [1].
   b. Unroute the coin cell battery cable [2].
   c. Lift the system coin cell away from the computer [3].



Installing the coin cell battery

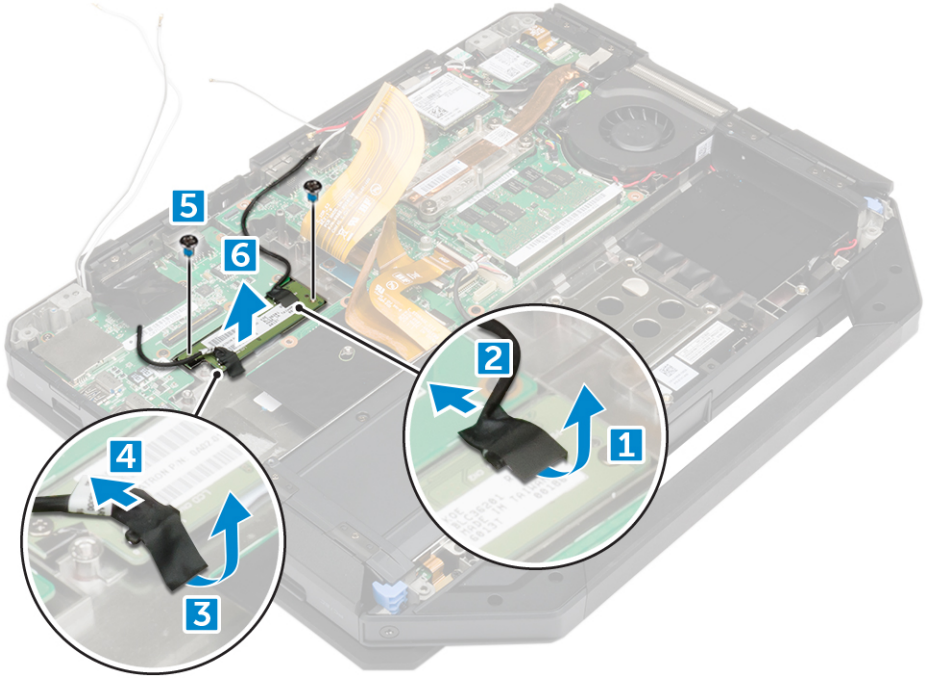
1. Place the coin cell into the slot on the computer chassis.
2. Route the coin cell cable.
3. Connect the coin cell cable to the computer.
4. Install the:
   a. base cover
   b. optical drive
   c. hard drive
   d. battery

5. Follow the procedure in After working inside your computer.

Driving board

Removing the driving board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
3. To remove the driving board:
   a. Peel the adhesive tape to access the display assembly cable [1].
   b. Disconnect the display assembly cable [2].
   c. Peel the adhesive tape to access the I/O cable [3].
   d. Disconnect the I/O cable [4].
   e. Remove the screws that secure the driving board to the computer [5].
   f. Lift the driving board from the computer [6].



Installing the driving board

1. Place the driving board on the computer.
2. Tighten the screws that secure the driving board on the computer.
3. Connect the I/O board cable.
4. Affix the adhesive tape.
5. Connect the display assembly cable
6. Affix the adhesive tape.
7. Install:
   a. base cover
   b. hard drive

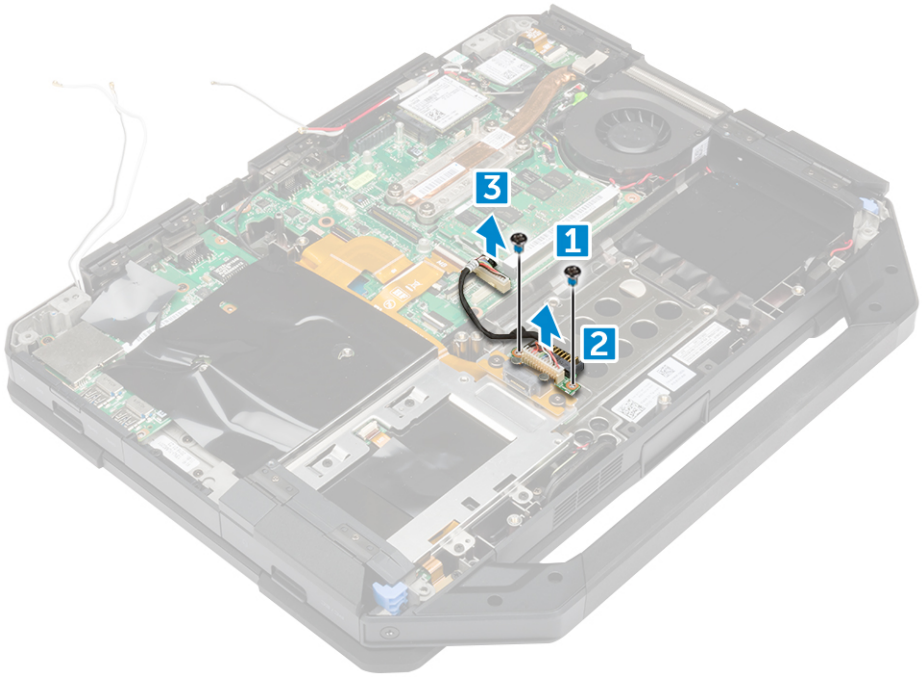
c. optical drive
d. battery

8. Follow the procedure in After working inside your computer.

Battery connector

Removing the battery connector

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. I/O board
3. To remove the battery connector:
   a. Disconnect the battery connector cable [1].
   b. Remove the screws that secure the battery connector [2].
   c. Lift the battery connector [3].



Installing the battery connector

1. Place the battery connector on the system board.
2. Tighten the screws to secure the battery connector to the computer.
3. Connect the battery connector cable.
4. Install the:
   a. I/O board
   b. base cover
   c. optical drive
   d. hard drive
   e. battery

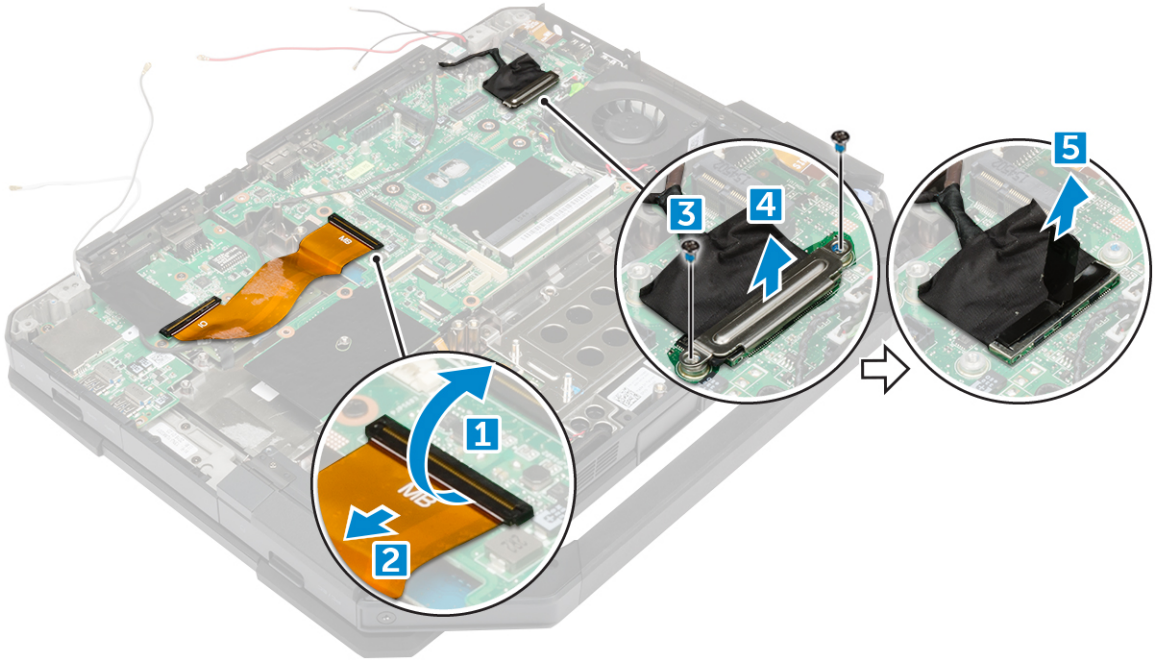
5. Follow the procedure in After working inside your computer.

System board

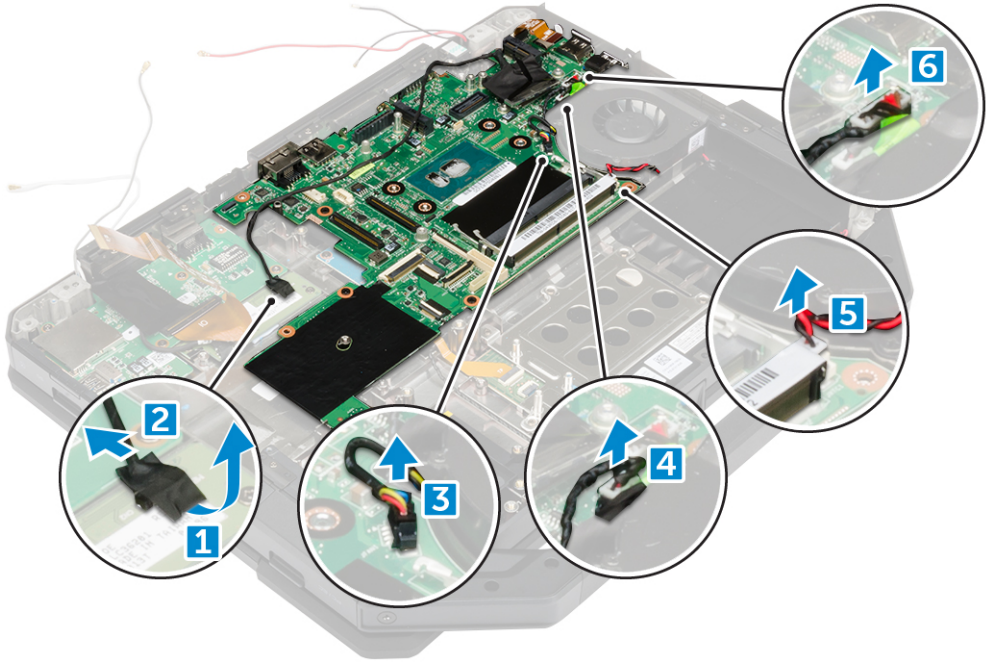
Removing the system board

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. I/O board
   f. GPS board
   g. WLAN card
   h. WWAN card
   i. hard drive tray
3. Lift the latch [1] and disconnect the system board cables [2].

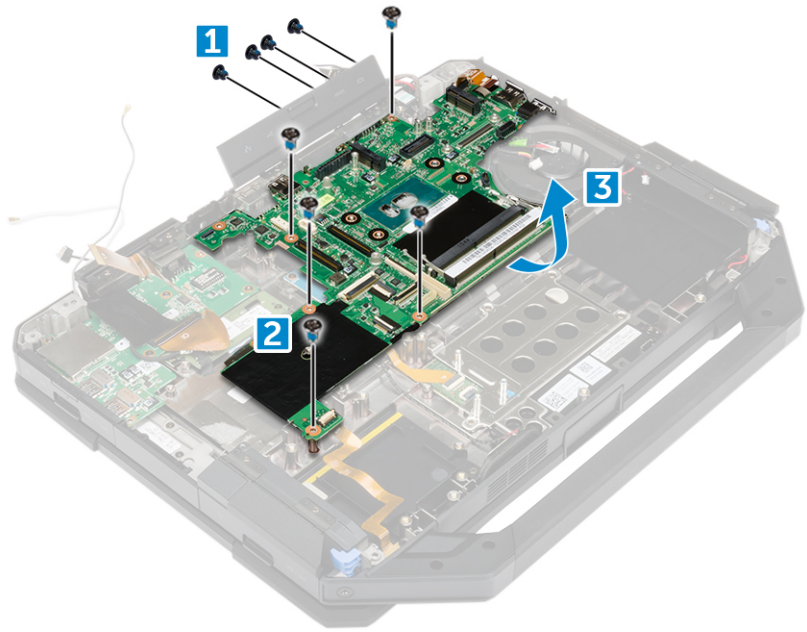
4. Close the display and flip the computer.
5. To release the system board:
   a. Lift the latch [1] and disconnect the I/O cable from the system board [2].
   b. Remove the screws that secure the metal tab [3].
   c. Lift the metal tab to access the eDP cable [4].
   d. Disconnect the eDP cable from the system board [5].



6. Peel the adhesive tape [1] and disconnect the following cables:
   a. display [2]
   b. system fan [3]
   c. speaker [4]
   d. coin cell battery [5]
   e. power connector [6]



7. To remove the system board:
   a. Remove the epoxy screws that secure the DisplayPort to the computer chassis [1].
   b. Remove the screws that secure the system board to the computer chassis [2].
   c. Lift the system board away from the computer chassis [3].



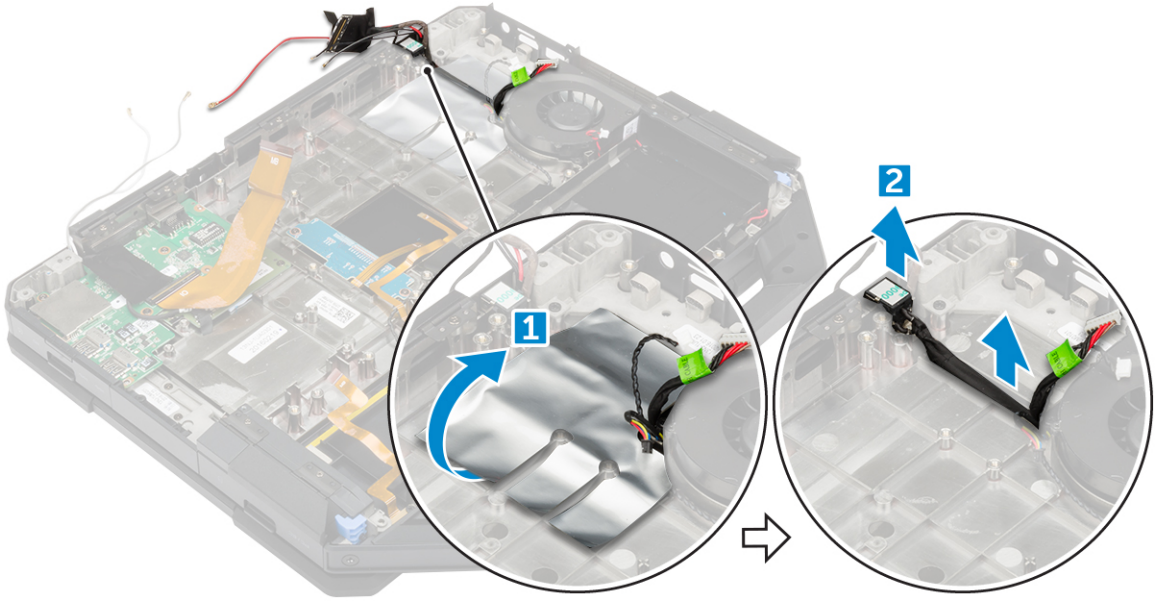
Installing the system board

1. Place the system board on the computer.
2. Tighten the screws to secure the system board to the computer.
3. Connect the following cables to the connectors on the system board:
   a. power connector
   b. coin cell battery
   c. speaker
   d. system fan
   e. display
4. Fix the adhesive tape to secure the display cable.
5. Connect the eDP cable to the connector on the system board.
6. Place the metal tab and tighten the screws to secure the metal tab.
7. Connect the system board cables to the connectors on the system board.
8. Flip the computer and open the display.
9. Connect the system board cable to the connector on the system board.
10. Install the:
    a. hard drive tray
    b. WLAN card
    c. WWAN card
    d. GPS board
    e. I/O board
    f. optical drive
    g. hard drive
    h. base cover
    i. battery
11. Follow the procedure in After working inside your computer.

Power connector port

Removing the power connector

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. hard drive
   c. optical drive
   d. base cover
   e. I/O board
   f. GPS board
   g. WLAN card
   h. WWAN card
   i. hard drive tray
   j. system board
3. To remove the power connector:
   a. Peel the adhesive tape to access the power connector [1].
   b. Pull and lift the power connector away from the computer [2].



Installing the power connector

1. Place the power connector onto the slot in the computer.
2. Affix the adhesive tape to secure the power connector.
3. Install the:
   a. system board
   b. hard drive tray
   c. WLAN card
   d. WWAN card
   e. GPS board
   f. I/O board
   g. optical drive
   h. hard drive
   i. base cover

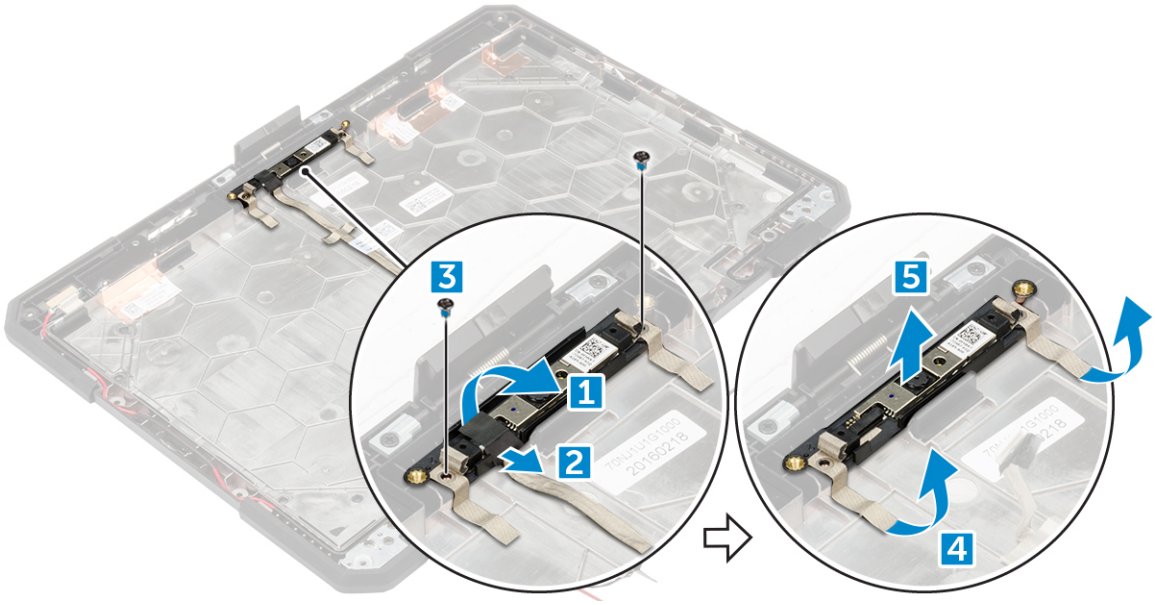
j. battery

4. Follow the procedure in After working inside your computer.

Camera

Removing the camera

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. battery
   b. display assembly
3. To remove the camera:
   a. Peel the adhesive tape [1] and disconnect the camera cable from the camera module [2].
   b. Remove the screws that secure the camera to the display panel [3].
   c. Peel the adhesive tape [4].
   d. Lift the camera away from the display [5].



Installing the camera

1. Place the camera on the camera module.
2. Affix the adhesive tape to secure the camera module.
3. Connect the camera cable to the connector.
4. Tighten the screws to secure the camera module to the display panel.
5. Affix the adhesive tape to the display.
6. Install the:
   a. display assembly
   b. battery
7. Follow the procedure in After working inside your computer.

4

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.

Topics:

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:

The ePSA diagnostics can be initiated by the FN+PWR buttons while powering on the computer.

- 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

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.

Running the ePSA Diagnostics

Invoke diagnostics boot by either of the methods that are suggested below:

1. Power on the computer.
2. As the computer boots, press the F12 key when the Dell logo is displayed.
3. In the boot menu screen, use Up/Down arrow key to select the **Diagnostics** option and then press **Enter**.

   NOTE: The **Enhanced Pre-boot System Assessment** window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.

4. Press the arrow in the lower-right corner to go to the page listing.
   The detected items are listed and tested.
5. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
6. Select the device from the left pane and click **Run Tests**.
7. If there are any issues, error codes are displayed.
   Note the error code and contact Dell.

   or
8. Shut down the computer.
9. Press and hold the Fn key, while pressing the power button, and then release both.
10. Repeat steps 3–7 above.

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 when the computer reads or writes data.
	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 green light	An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
Alternately blinking amber light with steady green 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.
green light on	Battery in charge mode with AC adapter present.

5

Using your computer

Topics:

- Using the backlit keyboard
- Stealth mode
- Enabling and disabling the wireless (WiFi) feature

Using the backlit keyboard

The Latitude rugged series comes equipped with a backlit keyboard that can be customized. The following colors are enabled:

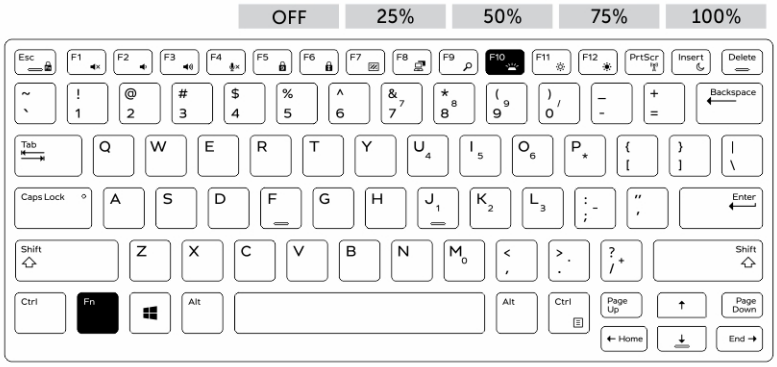
1. White
2. Red
3. Green
4. Blue

Alternatively, the system can be configured with two additional custom colors in the System Setup (BIOS).

Turning the keyboard backlight on/off or adjusting brightness

To turn the backlight on/off or adjust the backlight brightness settings:

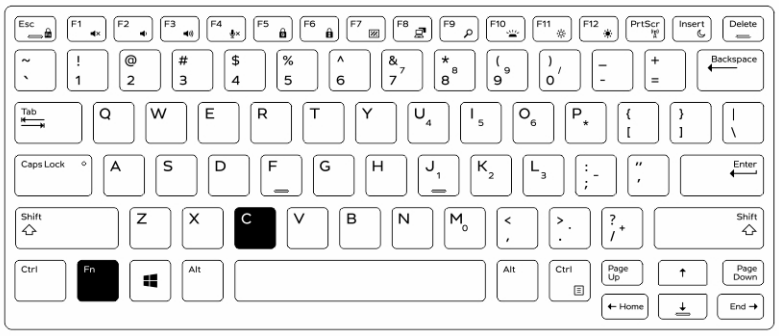
1. To initialize the keyboard backlight switch, press Fn+F10 (the Fn key is not needed if function key Fn lock is enabled).
2. The first use of the preceding key combination turns on the backlight to its lowest setting.
3. Repeated pressing of the key combinations cycles the brightness settings through 25 percent, 50 percent, 75 percent and 100 percent.
4. Cycle through the key combination to either adjust the brightness or turn off the keyboard backlight.



Changing the keyboard backlight color

To change the keyboard backlight color:

1. To cycle through the available backlight colors press Fn+C keys .
2. White, Red, Green and Blue are active by default; up to two custom colors can be added to the cycle in the System Setup (BIOS).



Customizing the backlit keyboard in System Setup (BIOS)

1. Turn off the computer.
2. Turn on the computer and when the Dell logo appears, press the F2 key repeatedly to bring up the System Setup menu.
3. Under **System Configuration** menu, select **RGB Keyboard Backlight**.
   You can enable/disable the standard colors (White, Red, Green and Blue).
4. To set a custom RGB value, use the input boxes on the right side of the screen.
5. Click **Apply changes** and click **Exit** to close System Setup.

Function Fn key lock features

NOTE: The keyboard has Function key Fn lock capability. When activated, the secondary functions on the top row of keys become default and will not require use of the Fn key.

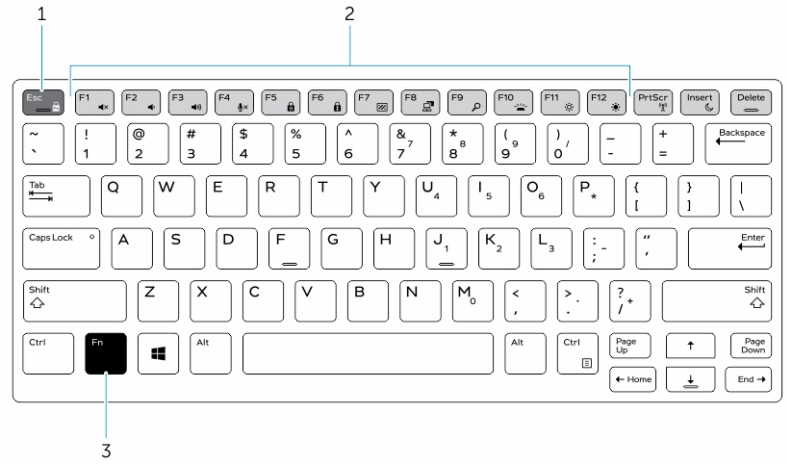


Figure 7. Fn key callouts

1. Fn lock key
2. Affected Fn keys
3. Fn key

NOTE: Fn lock affects only the above keys (F1 to F12). Secondary functions will not require the Fn key to be pressed while enabled.

Enabling the Function (Fn) lock

1. Press the Fn+Esc keys.

   NOTE: Other secondary function keys on the top row are not affected and requires the use of the Fn key.

2. Press the Fn+Esc keys again to deactivate the function lock feature.
   The function keys return to the default actions.

Stealth mode

Latitude rugged products come equipped with a stealth mode feature. Stealth mode allows you to turn off the display, all the LED lights, internal speakers, the fan and all wireless radios with a single key combination.

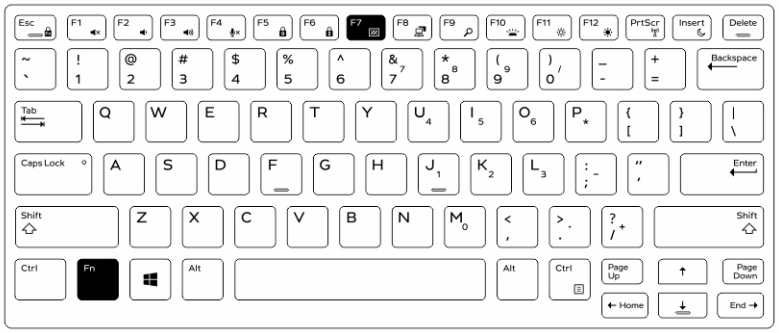
NOTE: This mode is aimed at using the computer in covert operations. When the stealth mode is enabled, the computer remains functional but does not emit any light or sound.

Turning stealth mode on/off

1. Press the Fn+F7 key combination (Fn key not needed if Fn lock is enabled) to turn on stealth mode.

   NOTE: Stealth mode is a secondary function of the F7 key. The key can be used to perform other functions on the computer when not used with the Fn key to enable stealth mode.

2. All the lights and sounds are turned off.
3. Press the Fn+F7 key combination again to turn off the stealth mode.



Disabling stealth mode in the system setup (BIOS)

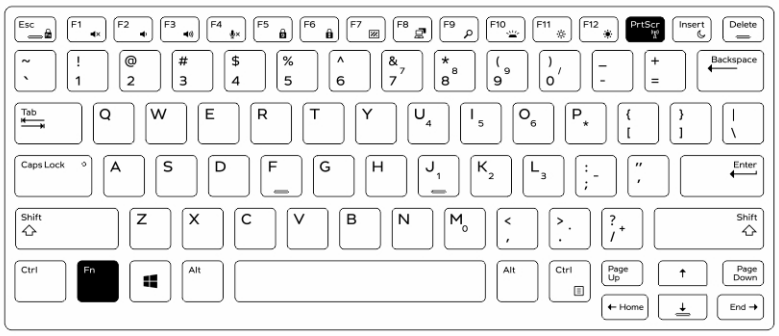
1. Power off the computer.
2. Power on the computer and at the Dell logo, tap the F2 key repeatedly to bring up the **System Setup** menu.
3. Expand and open the **System Configuration** menu.
4. Select **Stealth Mode Control**.

   NOTE: Stealth mode is enabled by default.

5. To disable stealth mode uncheck the **Enable Stealth Mode** option.
6. Click **Apply changes** and click **Exit**.

Enabling and disabling the wireless (WiFi) feature

1. To enable wireless Networking, press Fn + PrtScr.
2. Press Fn + PrtScr again to disable wireless Networking.


Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
PrtScr
Insert
Delete
Backspace
Tab
Caps Lock
Enter
Shift
Ctrl
Fn
Alt
Page Up
Page Down
Home
End

6

Technology and components

Topics:

Power adapter

This laptop is shipped with the 65 W and 90 W power adapters.

WARNING: When you disconnect the power adapter cable from the laptop, grasp the connector, not the cable itself, and then pull firmly but gently to avoid damaging the cable.

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

Processors

This laptop is shipped with the following Intel 7th generation processors:

- Intel Core i3 series
- Intel Core i5 series
- Intel Core i7 series

This laptop is also shipped with Intel Core i3 series 6th generation processor.

NOTE: The clock speed and performance varies depending on the workload and other variables.

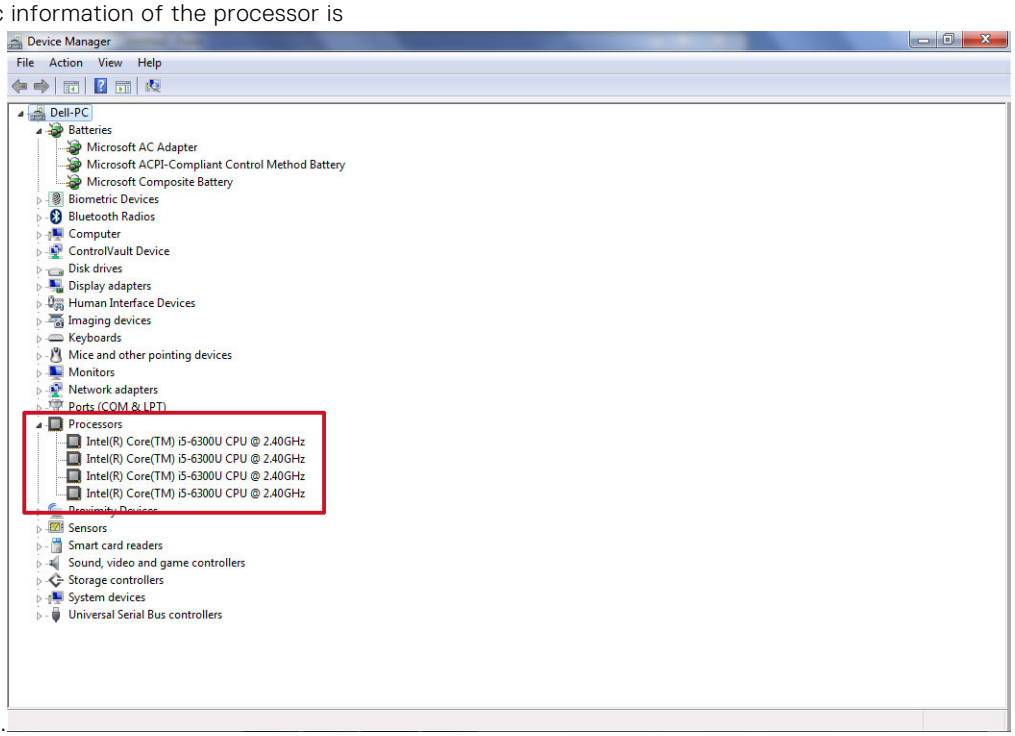
Identifying processors in Windows 10

1. Tap **Search the Web and Windows**.
2. Type **`Device Manager`**.
3. Tap **Processor**.
   The basic information of the processor is displayed.

Identifying processors in Windows 8

1. Tap **Search the Web and Windows**.
2. Type **`Device Manager`**.
3. Tap **Processor**.

The basic information of the processor is

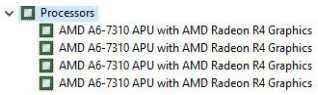


displayed.

Identifying processors in Windows 7

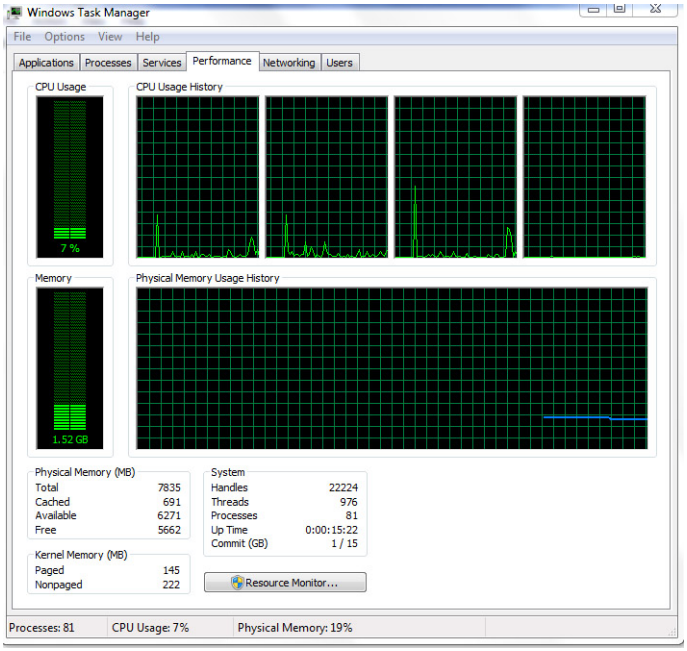
1. Click **Start** > **Control Panel** > **Device Manager**.
2. Select **Processor**.

The basic information of the processor is displayed.



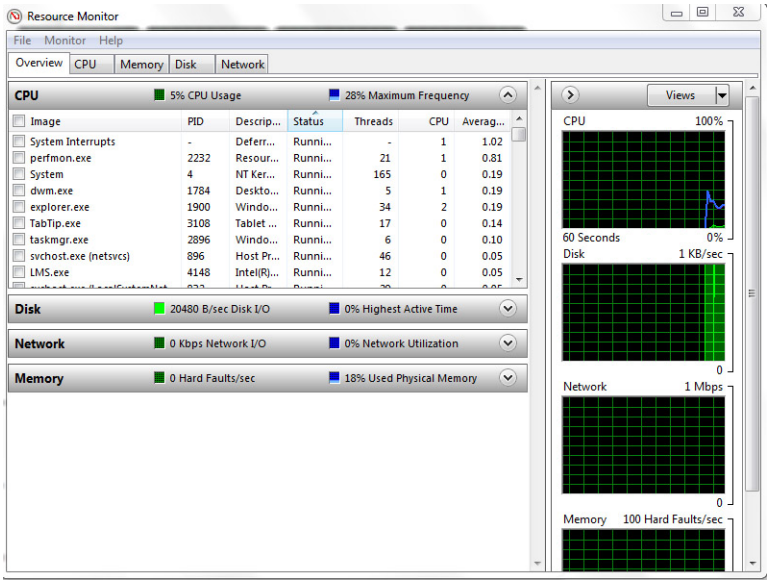
Verifying the processor usage in Task Manager

1. Press and hold the taskbar.
2. Select **Start Task Manager**.
   The **Windows Task Manager** window is displayed.
3. Click the **Performance** tab in the **Windows Task Manager** window. The processor performance details are displayed.



Verifying the processor usage in Resource Monitor

1. Press and hold the taskbar.
2. Select **Start Task Manager**.
   The **Windows Task Manager** window is displayed.
3. Click the **Performance** tab in the **Windows Task Manager** window.
   The processor performance details are displayed.
4. Click **Open Resource Monitor**.



Chipsets

All laptops or notebook communicate with the CPU through the chipset. This laptop is shipped with the Intel Mobile CM238 .

Downloading the chipset driver

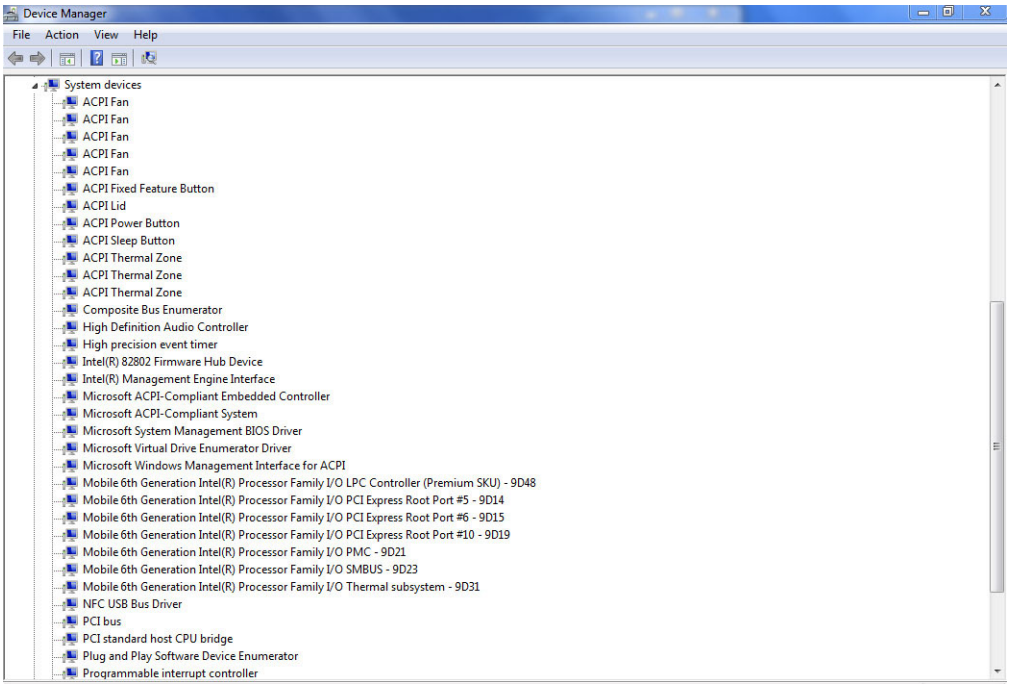
1. Turn on the laptop.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your laptop, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your laptop model.

4. Click **Drivers and Downloads**.
5. Select the operating system installed on your laptop.
6. Scroll down the page, expand **Chipset**, and select your chipset driver.
7. Click **Download File** to download the latest version of the chipset driver for your laptop.
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the chipset driver file icon and follow the instructions on the screen.

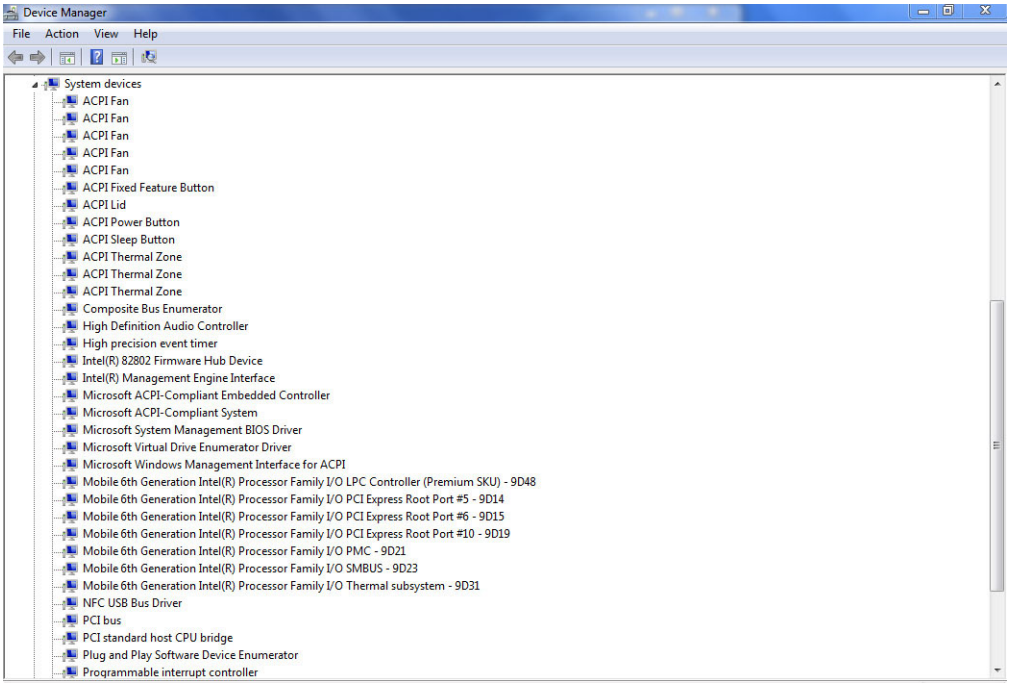
Identifying the chipset in Device Manager on Windows 10

1. Click **All Settings** on the Windows 10 Charms Bar.
2. From the **Control Panel**, select **Device Manager**.
3. Expand **System Devices** and search for the chipset.



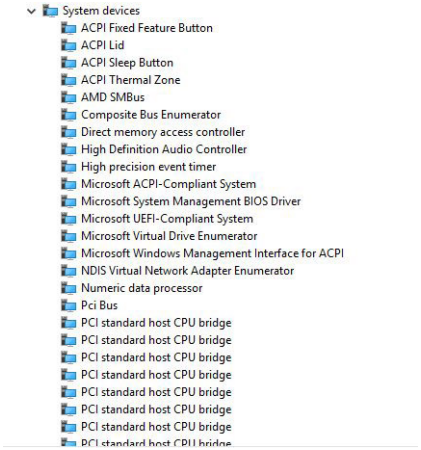
Identifying chipset in Device Manager on Windows 8

1. Click **Settings** on the Windows 8.1 Charms Bar.
2. From the **Control Panel**, select **Device Manager**.
3. Expand **System Devices** and search for the chipset.



Identifying chipset in Device Manager on Windows 7

1. Click **Start → Control Panel → Device Manager**.
2. Expand **System Devices** and search for the chipset.



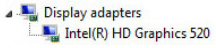
Intel HD Graphics 520

This laptop is shipped with the Intel HD Graphics 520 graphics chipset.

Intel HD Graphics drivers

Verify if the Intel HD Graphics drivers are already installed in the laptop.

Table 1. Intel HD Graphics drivers

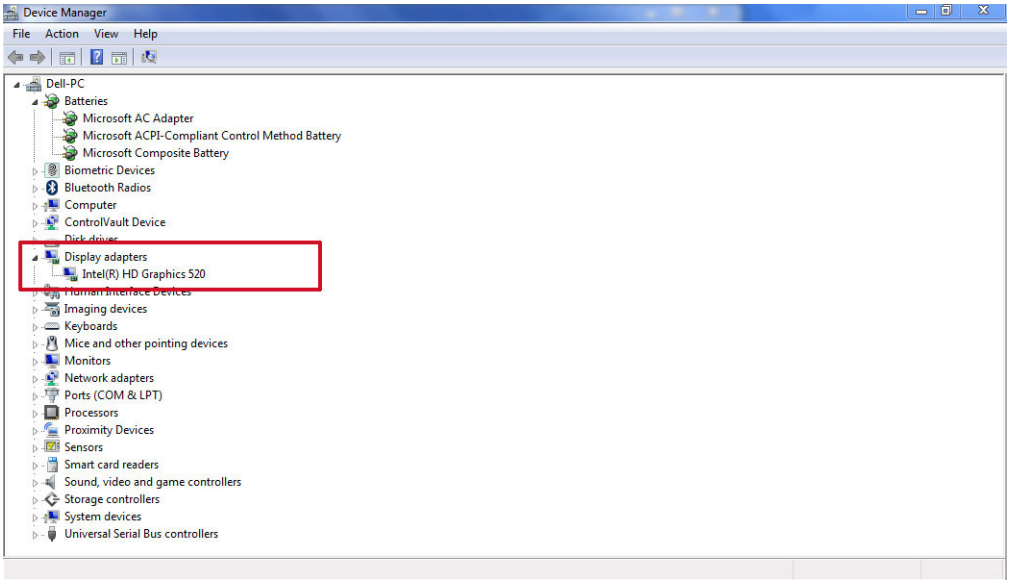
Before installation	After installation
	

Display options

This laptop has 14– inch HD with 1366 x 768 pixels resolution (maximum) and FHD with 1920 x 1080 resolution (maximum).

Identifying the display adapter

1. Start the **Search Charm** and select **Settings**.
2. Type `Device Manager` in the search box and tap **Device Manager** from the left pane.
3. Expand **Display adapters**.
   The display adapters are displayed.



Rotating the display

1. Right click on the desktop.
   A sub menu is displayed.
2. Select **Graphic Options** > **Rotation** and choose one of the following:
   - Rotate to Normal
   - Rotate to 90 Degrees
   - Rotate to 180 Degrees
   - Rotate to 270 Degrees

NOTE: The Display can also be rotated using the following key combinations:

- Ctrl + Alt + Up arrow key (Rotate to normal)
- Right arrow key (Rotate 90 degrees)
- Down arrow key (Rotate 180 degrees)
- Left arrow key (Rotate 270 degrees)

Downloading drivers

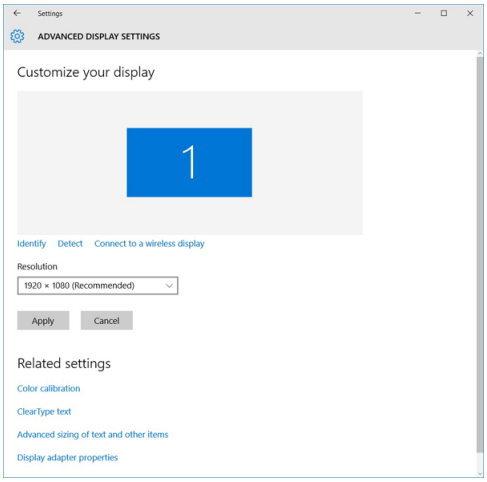
1. Turn on the laptop.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your laptop, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the auto detect feature or manually browse for your laptop model.

4. Click **Drivers and Downloads**.
5. Select the operating system installed on your laptop.
6. Scroll down the page and select the driver to install.
7. Click **Download File** to download the driver for your laptop.
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the driver file icon and follow the instructions on the screen.

Changing the screen resolution

1. Press and hold the desktop screen and select **Display Settings**.
2. Tap or click **Advanced display settings**.
3. Select the required resolution from the drop-down list and tap **Apply**.



Adjusting brightness in Windows 10

To enable or disable automatic screen brightness adjustment:

1. Swipe-in from the right edge of the display to access the Action Center.
2. Tap or click **All Settings** > **System** > **Display**.
3. Use the **Adjust my screen brightness automatically** slider to enable or disable automatic-brightness adjustment.

   NOTE: You can also use the **Brightness level** slider to adjust the brightness manually.

Adjusting brightness in Windows 8

To enable or disable automatic screen brightness adjustment:

1. Swipe-in from the right edge of the display to access the Charms menu.
2. Tap or click **Settings** → **Change PC Settings** → **PC and devices**→ **Power and sleep**.
3. Use the **Adjust my screen brightness automatically** slider to enable or disable automatic-brightness adjustment.

Adjusting brightness in Windows 7

To enable or disable automatic screen brightness adjustment:

1. Click **Start → Control Panel → Display.**
2. Use the **Adjust brightness** slider to enable or disable automatic-brightness adjustment.

   NOTE: You can also use the **Brightness level** slider to adjust the brightness manually.

Cleaning the display

1. Check for any smudges or areas that must be cleaned.
2. Use a microfiber cloth to remove any obvious dust and gently brush off any dust particles.
3. Proper cleaning kits should be used to clean and keep your display in a crisp clear pristine condition.

   NOTE: Never spray any cleaning solutions directly on the screen; spray it to the cleaning cloth.
4. Gently wipe the screen in a circular motion. Do not press hard on the cloth.

   NOTE: Do not press hard or touch the screen with your fingers or you may leave oily prints and smears.

   NOTE: Do not leave any liquid on the screen.
5. Remove all excess moisture as it may damage your screen.
6. Let the display dry thoroughly before you turn it on.
7. For stains that are hard to remove, repeat this procedure till the display is clean.

Connecting to external display devices

Follow these steps to connect your laptop to an external display device:

1. Ensure that the external display device is turned on and plug the external display device cable into a video port on your laptop.
2. Press the Windows logo+P key.
3. Select one of the following modes:
   - PC screen only
   - Duplicate
   - Extend
   - Second Screen only

   NOTE: For more information, see the document that shipped with your display device.

Using touch screen in Windows 8/ Windows 10

Follow these steps to enable or disable the touch screen:

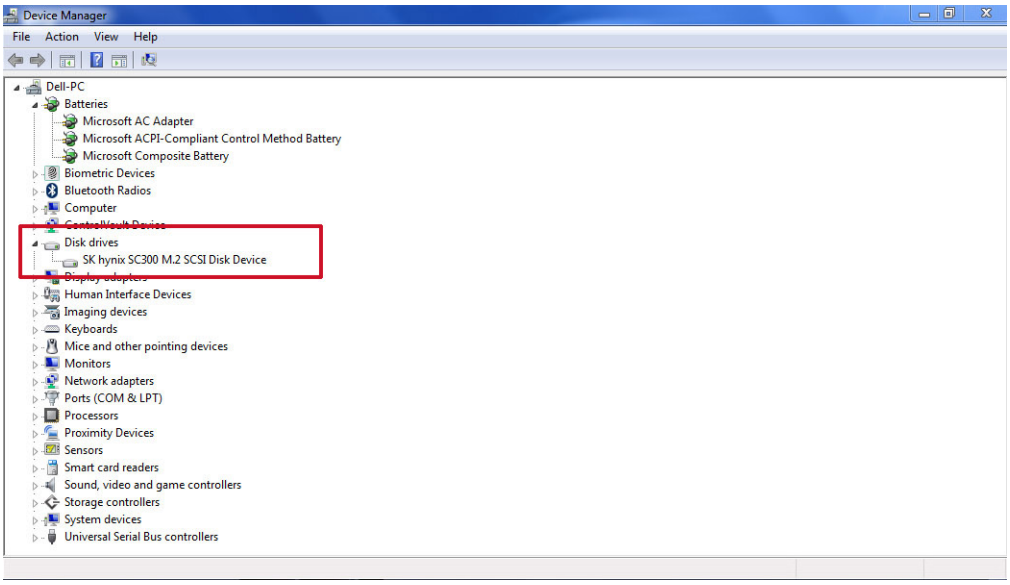
1. Go to the Charms Bar and tap **All Settings** .
2. Tap **Control Panel**.
3. Tap **Pen and Input Devices** in the **Control Panel**.
4. Tap the **Touch** tab.
5. Select **Use your finger as an input device** to enable the touch screen. Clear the box to disable the touch screen.

Hard drive options

This laptop supports M.2 SATA drives.

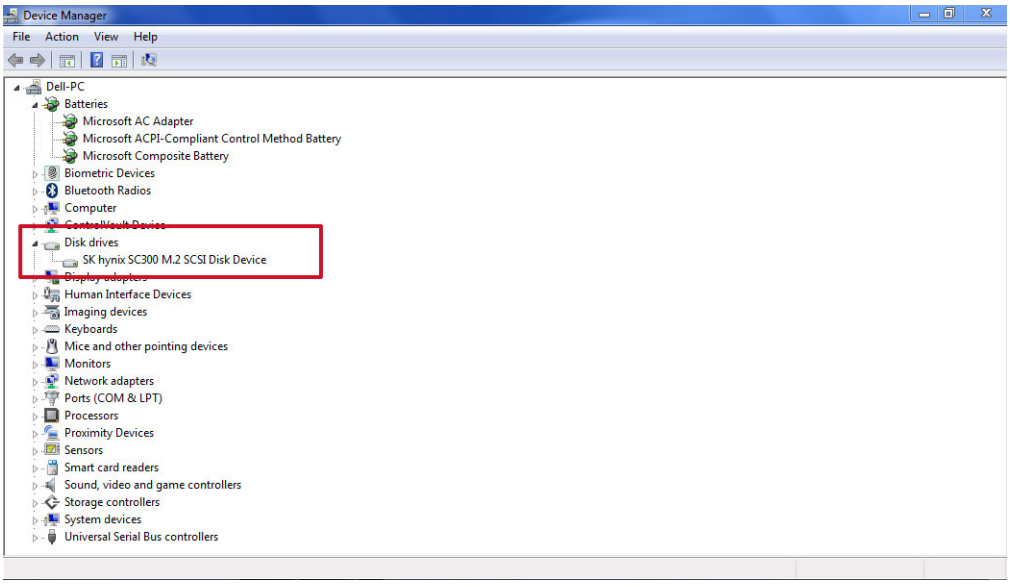
Identifying the hard drive in Windows 10

1. Tap or click **All Settings** on the Windows 10 Charms Bar.
2. Tap or click **Control Panel**, select **Device Manager** , and expand **Disk drives**.
   The hard drive is listed under **Disk drives**.



Identifying the hard drive in Windows 8

1. Tap or click **Settings** on the Windows 8 Charms Bar.
2. Tap or click **Control Panel**, select **Device Manager**, and expand **Disk drives**.
   The hard drive is listed under Disk drives.



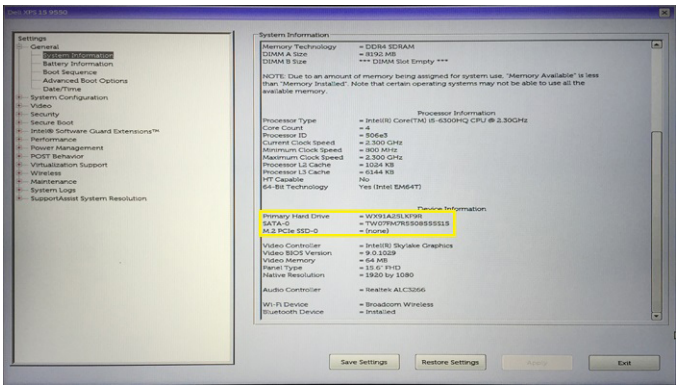
Identifying the hard drive in Windows 7

1. Click **Start** > **Control Panel** > **Device Manager**.
   The hard drive is listed under Disk drives.
2. Expand **Disk drives**.

Identifying the hard drive in the BIOS

1. Turn on or restart your system.
2. When the Dell logo appears, perform the following action to enter the BIOS setup program:
   - With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.

   The hard drive is listed under the **System Information** under the **General** group.



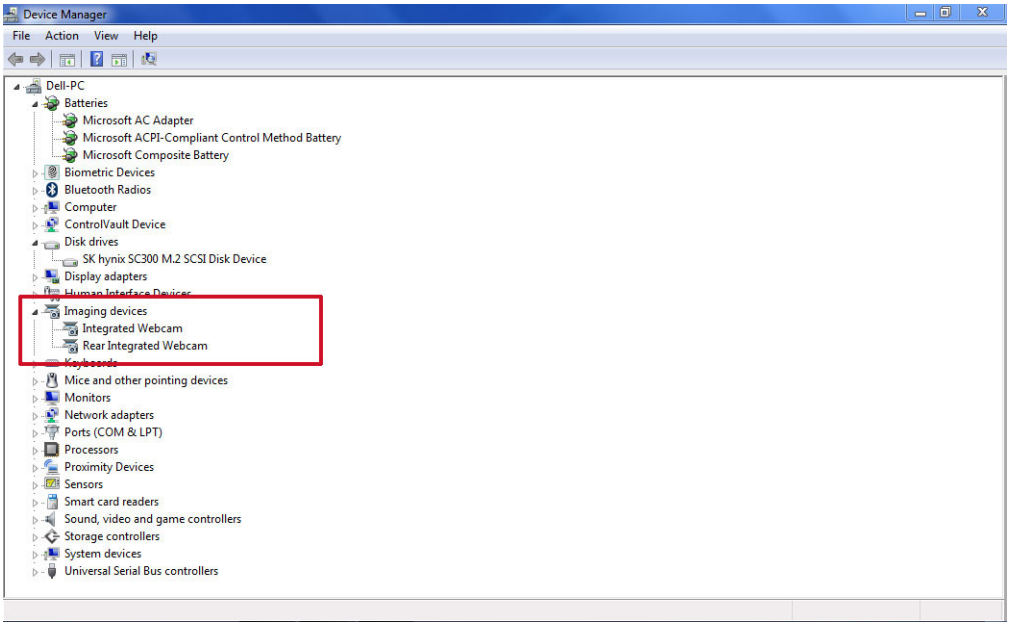
Camera features

This laptop comes with front-facing camera with the image resolution of 1280 x 720 (maximum).

NOTE: The camera is at the top center of the LCD.

Identifying the camera in Device Manager on Windows 10

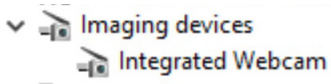
1. In the **Search** box, type `device manager`, and tap to start it.
2. Under **Device Manager**, expand **Imaging devices**.



Identifying the camera in Device Manager on Windows 8

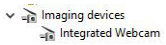
1. Start the Charms Bar from the desktop interface.
2. Select **Control Panel**.

3. Select **Device Manager** and expand **Imaging devices**.



Identifying the camera in Device Manager on Windows 7

1. Click **Start** > **Control Panel** > **Device Manager**.
2. Expand **Imaging devices**.

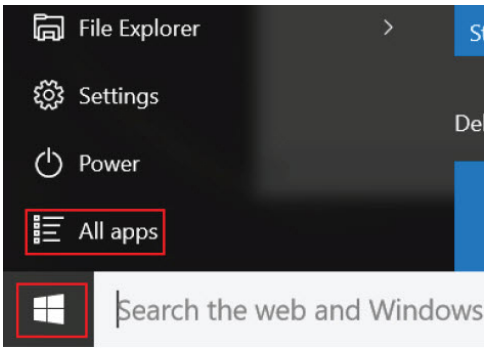


Starting the camera

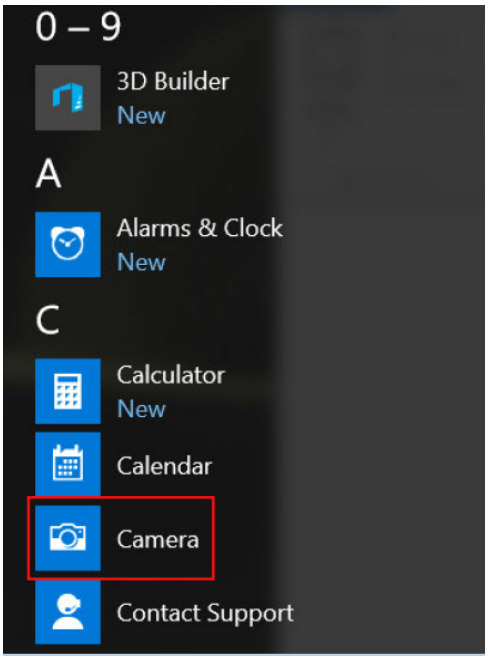
To start the camera, open an application that uses the camera. For instance, if you tap the Skype software that is shipped with the laptop, the camera turns on. Similarly, if you are chatting on the internet and the application requests to access the webcam, the webcam turns on.

Starting the camera application

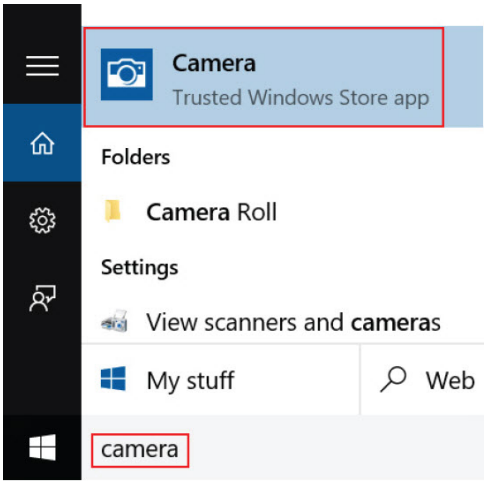
1. Tap or click the **Windows** button and select **All apps**.



2. Select **Camera** from the apps list.



3. If the **Camera** App is not available in the apps list, search for it.



Memory features

This laptop supports 4–32 GB DDR4 SDRAM memory, up to 2133 MHz.

Verifying system memory

Windows 10

1. Tap the **Windows** button and select **All Settings** > **System** .
2. Under **System**, tap **About**.

Windows 10

1. From your desktop, start the **Charms Bar**.
2. Select **Control Panel** and then select **System**.

Windows 7

- Click **Start** → **Control Panel** → **System**.

Verifying system memory in system setup BIOS

1. Turn on or restart your system.
2. Perform the following actions after the Dell logo is displayed
   - With keyboard — Tap F2 until the Entering BIOS setup message appears. To enter the Boot selection menu, tap F12.
3. On the left pane, select **Settings** > **General** > **System Information**,
   The memory information is displayed on the right pane.

Testing memory using ePSA

1. Turn on or restart your system.
2. Perform one of the following actions after the Dell logo is displayed:
   - With keyboard press **F12**.

- The system displays one time boot menu and uses up and down arrow key to go to diagnostics and press enter to launch ePSA.

The Pre Boot System Assessment (PSA) starts on your system.

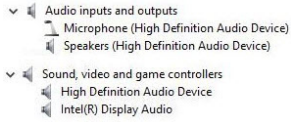
NOTE: If you wait too long and the operating system logo be displayed, continue to wait until you see the desktop. Turn off the laptop and try again.

NOTE: ePSA can alternatively be launched by pressing and holding **Fn**+ **Press Power button**.

Realtek HD audio drivers

Verify if the Realtek audio drivers are already installed in the laptop.

Table 2. Realtek HD audio drivers

Before installation	After installation
	

7

System setup

System setup enables you to manage your notebook 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

Boot sequence enables 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: XXXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

  NOTE: Choosing **Diagnostics**, displays the **SupportAssist** screen.

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

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.

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects 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.

Keys	Navigation
Esc	Moves to the previous page until 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.

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.

General screen options

This section lists the primary hardware features of your computer.

Option	Description
System Information	• System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code, Hot Swap Battery (if installed). • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM A Size, DIMM B Size. • 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. • Device Information: Displays Primary Hard Drive, MiniCard Device, ODD Device, Dock eSATA Device, LOM MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, WiGig Device, Cellular Device, Bluetooth Device.
Battery Information	Displays the battery status and the type of AC adapter connected to the computer.
Boot Sequence	**Boot Sequence**: Allows you to change the order in which the computer attempts to find an operating system. The options are: • Internal HDD • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC By default, all the options are checked. You can also clear any option or change the boor order. **Boot List Options**: Allows you to change the boot list option: • Legacy • UEFI (enabled by default)
Advanced Boot Options	Allows you the legacy option ROMs to load. By default, the **Enable Legacy Option ROMs** is disabled.
Date/Time	Allows you to change the date and time.

System Configuration screen options

Option	Description
Integrated NIC	You can configure the integrated network controller. The options are: • **Enable UEFI Network Stack** • **Disabled** • **Enabled** • **Enabled w/PXE**. This option is enabled by default.
Onboard Unmanaged NIC	You can control the on-board USB LAN controller. The options are: • **Disabled** • **Enabled**. This option is enabled by default.
Parallel Port	You can configure the parallel port on the docking station. The options are: • **Disabled** • **AT**. This option is enabled by default. • **PS2** • **ECP**
Serial Port 1	You can configure the integrated serial port. The options are: • **Disabled** • **COM1**. This option is enabled by default. • **COM3**
Serial Port 2	You can configure the integrated serial port. The options are: • **Disabled** • **COM2**. This option is enabled by default. • **COM4**
SATA Operation	You can configure the internal SATA hard drive controller. The options are: • **Disabled** • **AHCI** • **RAID On**. This option is enabled by default.
Drives	You can configure the SATA drives on board. All drives are enabled by default. The options are: • **SATA-0** • **SATA-2**
SMART Reporting	You can control 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. The option is: • **Enable SMART Reporting**. This option is disabled by default.
USB/Thunderbolt Configuration	You can configure the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (hard drive or memory key). If the USB port is enabled, the device attached to this port is enabled and available for the OS. If the USB port is disabled, the OS cannot see any device attached to this port. The options are: • **Enable USB Boot Support** • **Enable External USB Ports** • **Disable Docking Station Devices except video** **NOTE:** The USB keyboard and mouse always work in the BIOS setup irrespective of these settings.
USB PowerShare	You can configure the USB PowerShare feature behavior. This option allows you to charge external devices using the stored system battery power through the USB PowerShare port. This option is unchecked by default.
Audio	You can enable or disable the integrated audio controller. The **Enable Audio** option is selected by default.

Option	Description
Keyboard Illumination	You can choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 25 % to 100%. The options are: • **Disabled** • **Dim**. This option is enabled by default. • **Bright**
Keyboard Backlight Timeout on AC	The Keyboard Backlight with AC option does not affect the main keyboard illumination feature. Keyboard Illumination continues to support the various illumination levels. The options are: • **5 seconds** • **10 seconds**. This option is selected by default. • **15 seconds** • **30 seconds** • **1 minute** • **5 minute** • **15 minute** • **Never**
Keyboard Backlight Timeout on Battery	The Keyboard Backlight with Battery option does not affect the main keyboard illumination feature. Keyboard Illumination continues to support the various illumination levels. The options are: • **5 seconds** • **10 seconds**. This option is selected by default. • **15 seconds** • **30 seconds** • **1 minute** • **5 minute** • **15 minute** • **Never**
RGB Keyboard Backlight	You can configure the RGB keyboard backlight feature. There are six available colors: four preset colors (white, red, green, and blue) and two user configurable colors
Touchscreen	You can enable or disable the touchscreen. This option is enabled by default.
Stealth Mode Control	You can enable or disable the stealth mode. This option is enabled by default.

Video screen options

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source (On Battery and On AC).

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

Security screen options

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. **NOTE:** 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. **NOTE:** Password changes take effect immediately. By default, the drive will not have a password set.

Option	Description
System Password	Allows you to set, change or delete the system password. **NOTE:** Password changes take effect immediately. By default, the drive will not have a password set.
Internal HDD Password	Allows you to set, change or delete the password on the internal hard drive of the system. **NOTE:** Password changes take effect immediately. By default, the drive will not have a password set.
Strong Password	Allows you to enforce the option to always set strong passwords. Default Setting: Enable Strong Password is not selected. **NOTE:** If user interface is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Password Bypass	Allows you to enable or disable the permission to bypass the System and the Internal hard drive password, when they are set. The options are: ● Disabled ● Reboot bypass Default setting: Disabled
Password Change	Allows you to enable or disable permission to the System and Hard Drive passwords when the admin password is set. Default setting: **Allow Non-Admin Password Changes** is selected.
Non-Admin Setup Changes	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.
UEFI Capsule Firmware Updates	This option controls whether the system allows BIOS updates via UEFI capsule update packages. **NOTE:** Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS).
TPM 1.2 Security	Allows you to enable the Trusted Platform Module (TPM) during POST. You can control whether the trusted platform module is visible to the operating system. The option is: **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.** **NOTE:** Disabling this option does not chhange any settings you have made to the TPM, nor does it delete or change any information or keys you may have stored in the TPM. Changes to this setting take effect immediately.
Computrace	Allows you to activate or disable the optional Computrace software The options are: ● Deactivate ● Disable ● Activate **NOTE:** The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed Default setting: Deactivate
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. Enable CPU XD Support (default)

Option	Description
OROM Keyboard Access	Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are: ● Enabled ● One Time Enable ● Disabled Default setting: Enable
Admin Setup Lockout	Allows you to prevent users from entering the setup when an Administrator password is set. Default Setting: Enable Admin Setup Lockout is not selected.

Secure Boot screen options

Option	Description
Secure Boot Enable	This option enables or disables the **Secure Boot** feature. ● Disabled ● Enabled Default setting: Enabled.
Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: ● PK ● KEK ● db ● dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: ● **Save to File**—Saves the key to a user-selected file ● **Replace from File**—Replaces the current key with a key from a user-selected file ● **Append from File**—Adds a key to the current database from a user-selected file ● **Delete**—Deletes the selected key ● **Reset All Keys**—Resets to default setting ● **Delete All Keys**—Deletes all the keys **NOTE:** If you disable the **Custom Mode**, all the changes made will be erased and the keys will restore to default settings.

Performance screen options

Option	Description
Multi Core Support	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. ● Enable Multi Core Support Default setting: The option is enabled.
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of the processor. ● Enable Intel SpeedStep Default setting: The option is enabled.
C-States Control	Allows you to enable or disable the additional processor sleep states. ● C states Default setting: The option is enabled.

Option	Description
HyperThread Control	Allows you to enable or disable the HyperThreading in the processor. ● Disabled ● Enabled Default setting: Enabled.

Power Management screen options

Option	Description
AC Behavior	You can enable or disable the computer from turning on automatically when an AC adapter is connected. The option is: ● **Wake on AC** This option is not selected by default.
Auto On Time	You can set the time at which the computer must turn on automatically. The options are: ● **Disabled**. This option is selected by default. ● **Every Day** ● **Weekdays** ● **Select Days**
USB Wake Support	You can enable USB devices to wake the system from Standby. **NOTE:** 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. The option is: ● **Enable USB Wake Support** This option is disabled by default.
Wireless Radio Control	You can enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection.The options are: ● **Control WLAN Radio** ● **Control WWAN Radio** This option is disabled by default.
Wake on LAN/ WLAN	You can enable or disable the feature that turns on the computer from the Off state: ● When triggered by a LAN signal ● From the hibernate state when triggered by a special wireless LAN signal The options are: ● **Disabled**. This option is set by default. ● **LAN Only** ● **WLAN Only** ● **LAN or WLAN**
Block Sleep	You can block entering to sleep (S3 state) in operating system environment. The option is: ● **Block Sleep (S3 state)** This option is disabled by default.
Peak Shift	You can minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached. The option is: ● **Enable Peak Shift** This option is disabled by default.

Option	Description
Advanced Battery Charge Configuration	You can 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. The option is: ● **Enable Advance Battery Charge Mode** This option is disabled by default.
Primary Battery Charge Configuration	You can select the charging mode for the battery. The options are: ● **Adaptive**. This option is set by default. ● **Standard** — Fully charges your battery at a standard rate. ● **ExpressCharge** — The battery charges over a shorter period of time using Dell's fast charging technology. ● **Primarily AC use** ● **Custom** If **Custom** charge is selected, you can also configure **Custom Charge Start** and **Custom Charge Stop**. **NOTE:** All charging mode may not be available for all the batteries. To enable this option, disable the **Advanced Battery Charge Configuration** option.

POST Behavior screen options

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. Default setting: Enable Adapter Warnings
Keypad (Embedded)	Allows you to choose one of two methods to enable the keypad that is embedded in the internal keyboard. ● Fn Key Only: This option is enabled by default. ● By Numlock **NOTE:** When setup is running, this option has no effect. Setup works in Fn Key Only mode.
Mouse/Touchpad	Allows you to define how the system handles mouse and touch pad input. The options are: ● Serial Mouse ● PS2 Mouse ● Touchpad/PS-2 Mouse: This option is enabled by default.
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Enable Network. This option is enabled by default.
Fn Key Emulation	Allows you to set the option where the Scroll Lock key is used to simulate the Fn key feature. Enable Fn Key Emulation (default)
Fn Lock Options	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: ● Fn Lock. This option is selected by default. ● Lock Mode Disable/Standard ● Lock Mode Enable/Secondary
MEBx Hotkey	Allows you to specify whether the MEBx Hotkey function should enable, during the system boot. Default Setting: Enable MEBx Hotkey
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: ● Minimal ● Thorough (default) ● Auto

Option	Description
Extended BIOS POST Time	Allows you to create an additional preboot delay. The options are: • 0 seconds. This option is enabled by default. • 5 seconds • 10 seconds

Virtualization support screen options

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Enable Intel Virtualization Technology (default).
VT for Direct I/O	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.
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM Virtualization Technology, and Virtualization technology for direct I/O must be enabled to use this feature. Trusted Execution - disabled by default.

Maintenance screen options

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

System Log screen options

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
Power Events	Allows you to view and clear the System Setup (Power) events.

Updating the BIOS in Windows

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

NOTE: If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re enabled after the BIOS update is completed.

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Base Article: https://www.dell.com/support/kbdoc/000134415/.

1. Restart the computer.
2. Go to **Dell.com/support**.

- Enter the **Service Tag** or **Express Service Code** and click **Submit**.
- Click **Detect Product** and follow the instructions on screen.

3. If you are unable to detect or find the Service Tag, click **Choose from all products**.
4. Choose the **Products** category from the list.

   NOTE: Choose the appropriate category to reach the product page.

5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.
   The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.
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.

System and setup password

Table 3. System and setup password

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.

You can create a system password and a setup password to secure 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: System and setup password feature is disabled.

Assigning a system setup password

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

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

1. In the **System BIOS** or **System Setup** screen, select **Security** and press **Enter**.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   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, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press **Esc** and a message prompts you to save the changes.
5. Press **Y** to save the changes.
   The computer reboots.

Deleting or changing an existing system setup password

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and 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 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 restarts.

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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, from the charms sidebar, click or tap **Settings** > **Change PC settings**. In the **PC Settings** window, select **PC and devices** > **PC Info**.
- Windows 7, click **Start**, right-click **My Computer**, and then select **Properties**.

Topics:

System information specifications

Feature	Specification
DRAM bus width	64 bit
Flash EPROM	SPI 128 Mbits
PCIe 3.0 bus	8.0 GHz

Processor specifications

Feature	Specification
Types	Intel Core i3/i5/i7 series
L3 cache	up to 4 MB
External bus frequency	2133 MHz

Memory specifications

Feature	Specification
Memory connector	Two SODIMM slots
Memory capacity	4 GB, 8 GB, and 16 GB
Memory type	DDR4 SDRAM
Speed	2133 MHz
Minimum memory	4 GB
Maximum memory	32 GB

Battery specifications

Feature	Specification
Type	6-cell or 9-cell smart lithium ion
Depth	80 mm (3.14 inches)
Height	21 mm (0.82 inches)
Width	166.9 mm (6.57 inches)
Weight	• 6-cell: 365.5 g (0.80 lb) • 9-cell: 520 g (1.14 lb)
Voltage	14.8 V DC
Life span	300 discharge per charge cycles
Temperature range	
Operating	• Charging: 0°C to 60°C (32°F to 140°F) • Discharging: 0°C to 70°C (32°F to 158°F)
Nonoperating	–51°C to 71°C (–60°F to 160°F) **NOTE:** The battery pack is capable of safely withstanding the above storage temperatures with 100% charge. **NOTE:** The battery pack is also capable of withstanding storage temperatures from –20°C to +60°C with no degradation in its performance.
Coin cell battery	3 V CR2032 lithium coin cell

Audio specifications

Feature	Specification
Type	four channel high definition audio
Controller	HDA Codec - ALC3235
Stereo conversion	24 bit (analog-to-digital and digital-to-analog)

Feature	Specification
Interface (internal)	HD audio
Interface (external)	microphone in/stereo headphones/external speakers connector
Speakers	one mono speaker
Internal speaker amplifier	2 W (RMS)
Volume controls	Volume up/Volume down buttons

CAUTION: Adjustment of volume control, as well as the equalizer in the operating system and/or equalizer software, to other settings than the center position may increase the earphones and/or headphones output and cause hearing damage or loss.

Video specifications

Feature	Specification
Type	integrated on system board
Controller (UMA) — Intel core i3/i5/i7	Intel HD Graphics 520
Discrete	AMD Radeon R7 M360 discrete graphics card

Communication specifications

Feature	Specification
Network adapter	10/100/1000 Mb/s Ethernet (RJ-45)
Wireless	• WLAN with Bluetooth 4.1 enabled • WWAN

Port and connector specifications

Feature	Specification
Audio	one microphone/stereo headphone/speakers connector
Video	• one 19-pin HDMI port • one 15-pin VGA port
Network adapter	two RJ45 connectors
Serial port	two DB9 pin serial ports
Docking port	one
USB ports	• one 4-pin USB 2.0-compliant port • one 9-pin USB 3.0-compliant port with PowerShare • two 9-pin USB 3.0-compliant ports
SIM card slot	one micro-SIM slot with security feature

Display specifications

Feature	Specification
Type	WLED display
Size	14.0 inches
Height	190.00 mm (7.48 inches)
Width	323.5 mm (12.59 inches)
Diagonal	375.2 mm (14.77 inches)
Active area (X/Y)	309.4 mm x 173.95 mm
Maximum resolution	1366 x 768 pixels
Refresh rate	60 Hz
Operating angle	0° (closed) to 180°
Maximum viewing angles (horizontal)	+/- 70° minimum for HD
Maximum viewing angles (vertical)	+/- 70° minimum for HD
Pixel pitch	0.1875 mm

Touchpad specifications

Feature	Specification
Active Area:	
X-axis	99.50 mm
Y-axis	53.00 mm

Keyboard specifications

Feature	Specification
Number of keys	• 83 keys: US English, Thai, French-Canadian, Korean, Russian, Hebrew, English-International • 84 keys: UK English, French Canadian Quebec, German, French, Spanish (Latin America), Nordic, Arabic, Canada Bilingual • 85 keys: Brazilian Portuguese • 87 keys: Japanese
Layout	QWERTY/AZERTY/Kanji

Adapter specifications

Feature	Specification
Type	65 W and 90 W
Input voltage	100–240 V AC

Feature	Specification
Input current (maximum)	• 65 W — 1.7 A • 90 W — 1.5 A
Input frequency	50–60 Hz
Output current	• 65 W — 3.34 A • 90 W — 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 (nonoperating)	–40°C to 70°C (–40°F to 158°F)

Physical dimension specifications

Feature	Specification
Height	44.4 mm (1.75 inches)
Width	243 mm (9.56 inches)
Length	347 mm (13.66 inches)
Weight (minimum config)	6.55 lbs (2.95 kg)

Environmental specifications

Feature	Specifications
Temperature — operating	–29°C to 60°C (–20°F to 140°F)
Temperature — storage	–51°C to 71°C (–60°F to 160°F)
Relative humidity (maximum) — operating	10% to 90% (noncondensing)
Relative humidity (maximum) — storage	0% to 95% (noncondensing)
Altitude (maximum) — operating	–15.24 m to 4572 m (–50 ft to 15,000 ft)
Altitude (maximum) — nonoperating	–15.24 m to 9144 m (–50 ft to 30,000 ft)
Airborne contaminant level	G1 as defined by ISA-71.04–1985

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Troubleshooting

Table 4. Troubleshooting

Issue	Suggested Troubleshooting Steps
Battery Charging	The battery should be charged while the system is off for faster charge time. Users may notice longer charge times when the system is turned on and running graphics-intensive applications. **CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**
No POST	When a user starts the notebook, the first thing that the BIOS does is to perform the Power-On Self-Test (POST). The POST is a built-in diagnostic program that checks the hardware to make sure that everything is present and functioning properly, before the BIOS begins the actual boot. If the system does not perform a Power-On Self-Test, there are various things that you can look for: 1. Check that the system has a power light. 2. If the system has no power light, make sure that it is plugged into AC power. 3. Remove the battery. Make sure that the power is turned off and the system is unplugged. 4. Remove all CRUs from the system and reconnect the AC adapter to the system and try again. 5. Run the ePSA diagnostics.
Video	If the LCD on the system does not show any display or has other problems, here are some basic steps that you can perform: 1. If the LCD is not displaying video or the video is garbled, run the ePSA diagnostics. 2. If the LCD is not displaying any video, connect an external monitor to eliminate a no-POST problem. A good image on the external monitor eliminates a video card problem or a POST problem. 3. Connect an external monitor, when possible, for all LCD-related problems to help eliminate a possible software or video card problem. 4. If the LCD has dim video, adjust the brightness or connect an AC adapter to eliminate a power management conservation setting in the BIOS. 5. If the LCD has lines on the screen, check the system during POST and system setup, to determine if the lines are present in all modes of operation. Run the ePSA diagnostics. 6. If the LCD has color problems, run the ePSA diagnostics. 7. If the LCD has burned-out pixels, verify that the LCD is still within LCD standard guidelines. For Dell internal users only, click here.
BIOS	If users have problems while using the notebook, the problems may be related to BIOS settings configured incorrectly in BIOS/System Setup. Check the System Setup pages to verify the settings on each page. Try resetting BIOS to default settings by pressing Alt+F.
Touchpad and Keyboard	To troubleshoot touchpad and keyboard-related problems, you can perform the following steps: 1. Attach an external mouse or keyboard to check for peripheral functionality. 2. Run the ePSA diagnostics.

Table 4. Troubleshooting (continued)

Issue	Suggested Troubleshooting Steps
Integrated NIC	If the system is not able to identify any network after connecting the network cable to the network port, try the following troubleshooting steps: 1. Make sure that the network driver has been installed and is working properly. 2. Check System Setup to make sure that the NIC is enabled. 3. Try reseating the cable. 4. Try a known good cable, if one is available. 5. If a known good system is available, check if that system is connecting to the network. 6. Run the ePSA diagnostics on the network port. **NOTE:** If the integrated network hardware solution is defective or nonfunctional, replace the system board.
VGA	No additional drivers or updates are needed for VGA functionality. When troubleshooting an external monitor, keep these tips in mind: ● Check both ends of the cable for a snug connection into the laptop and into the external monitor. ● Adjust the contrast and brightness controls on the external monitor. ● Make sure that the notebook is not set to internal display only. ● Swap with a known good cable. ● Try with a known good external monitor. Check the external device's documentation for any additional steps required for functionality. **NOTE:** If the VGA hardware port is defective or nonfunctional, replace the system board.

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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.