Dell Latitude 12 Rugged Extreme – 7214 Owner's Manual

Regulatory Model: P18T
Regulatory Type: P18T002

Notes, cautions, and warnings

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

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

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

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Contents

1

Working on your computer

Before working inside your computer

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

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

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

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

NOTE: The separation distance from the human body to the antenna on the product for the front side shall be equal or more than 20 cm.

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

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

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

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

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

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

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

3. If the computer is connected to a docking device (docked), undock it.

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

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

   NOTE: To avoid damaging the system board, you must remove the main battery before you service the computer.

7. Remove the battery.
8. Turn the computer top-side up.
9. Open the display.
10. Press the power button to ground the system board.

    CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the display.

    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 10

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.

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):
     1. Swipe in from the right edge of the screen, opening the **Charms** menu and select **Settings**.
     2. Tap and then tap **Shut down**

- In Windows 8 (using a mouse):
  1. Point to upper-right corner of the screen and click **Settings**.
  2. Click ⏻ and then click **Shut down**.

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 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.

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.

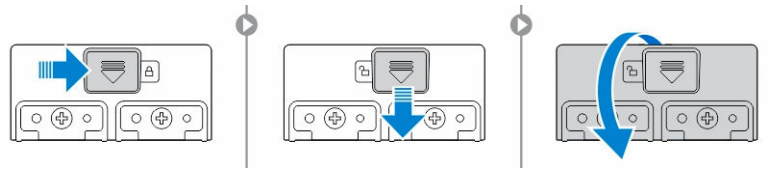
   CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.
3. Replace the battery.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

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.



2

System overview

System top view

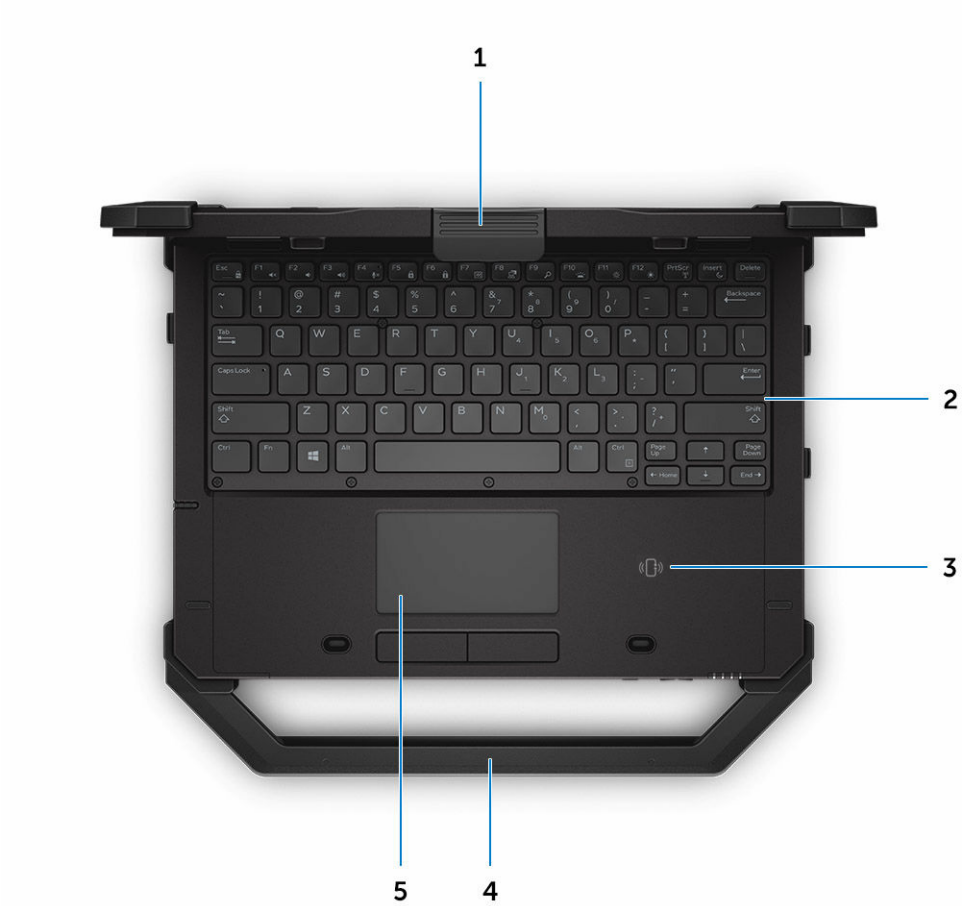


Figure 1. System top view

1. display latch
2. keyboard
3. contactless smart card reader
4. handle
5. touchpad

System front view

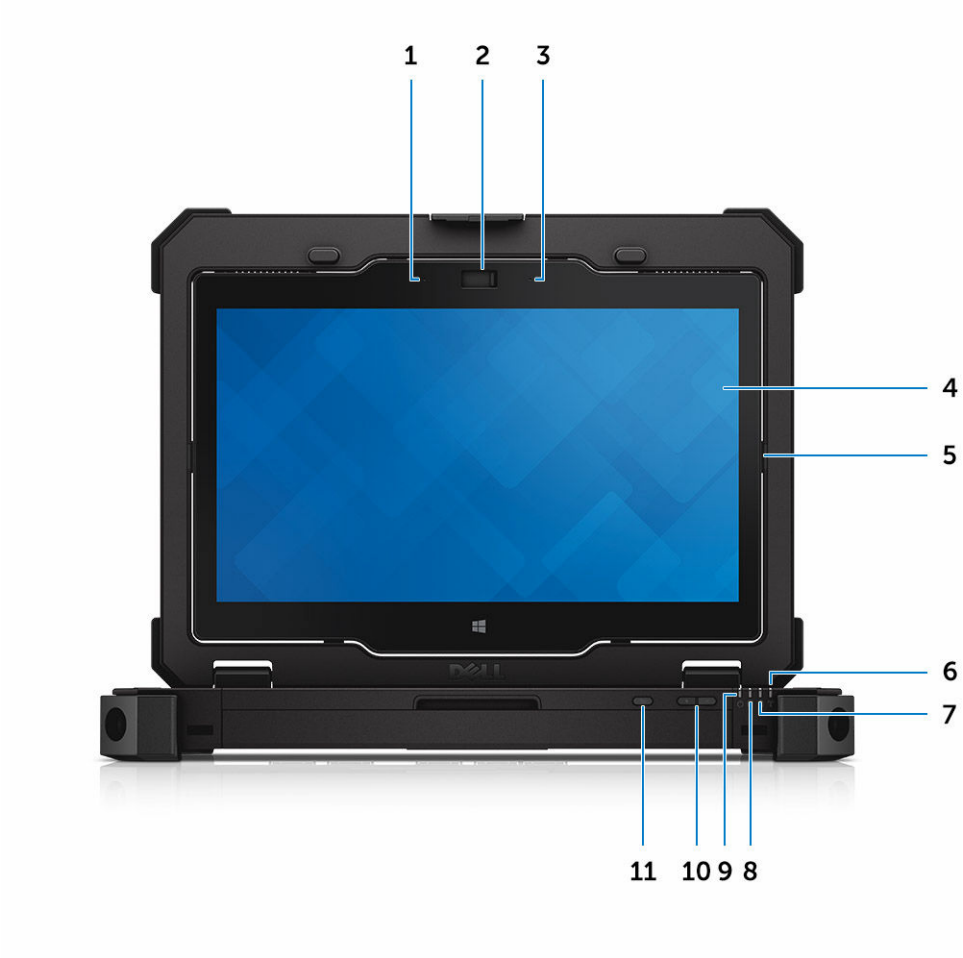


Figure 2. System front view

1. microphone
2. camera (optional)
3. microphone
4. rotatable outdoor readable display/ touchscreen
5. flip hinge
6. wireless status light
7. hard drive activity light
8. battery status light
9. power status light
10. volume buttons
11. screen rotate button

System back view

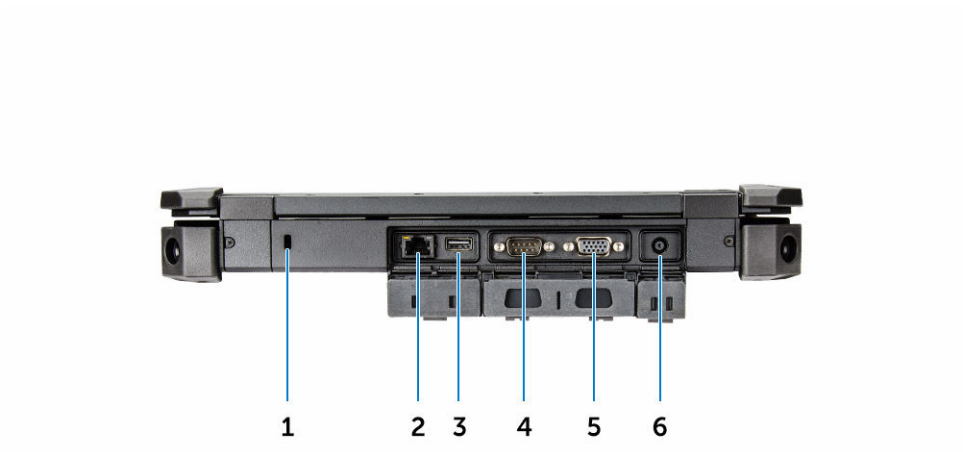


Figure 3. System back view

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

System base view

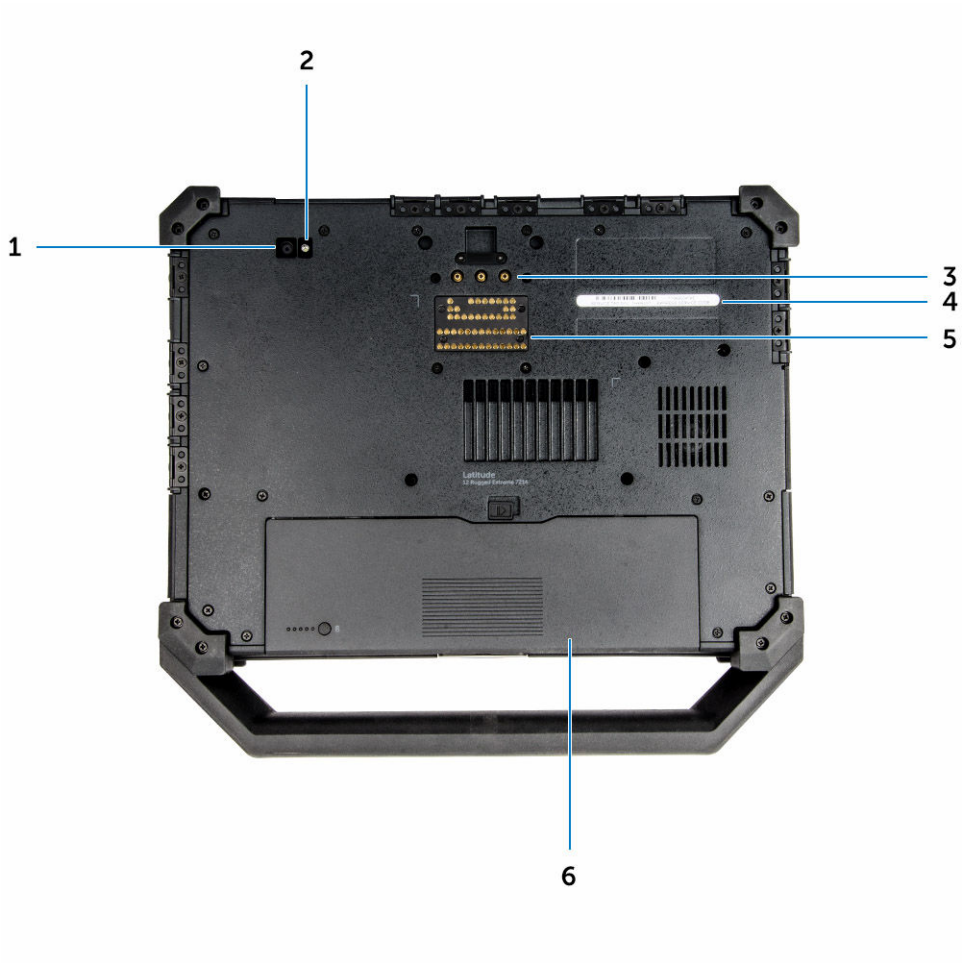


Figure 4. System base view

1. back camera
2. camera flash
3. radio frequency pass-through connectors
4. service tag
5. docking device connector
6. battery

System side view

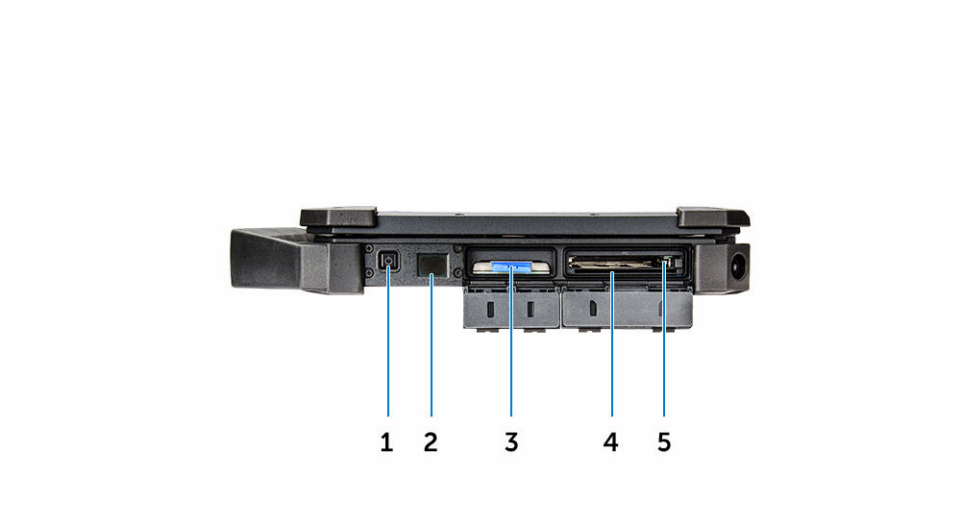


Figure 5. System side view — right

1. power button
2. fingerprint reader
3. hard drive
4. memory card reader/ Express card reader (optional)
5. secure card reader

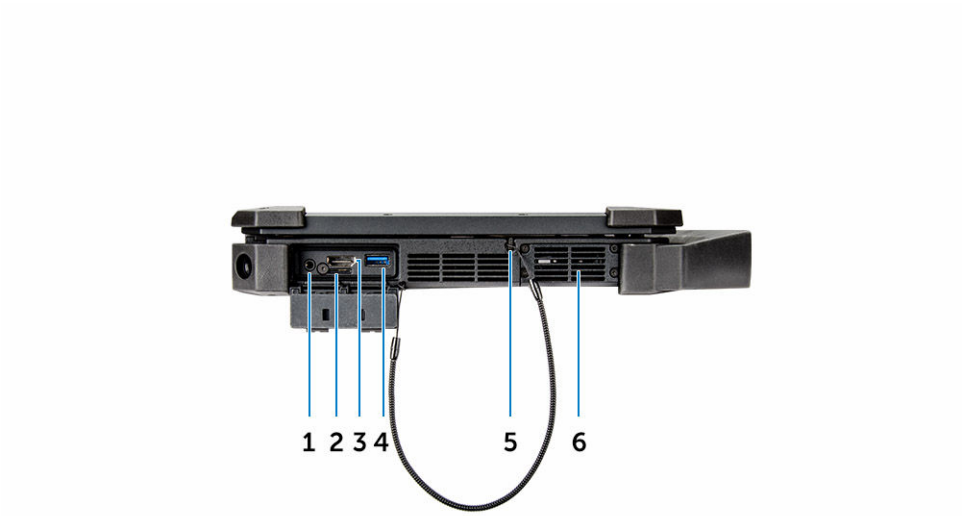


Figure 6. System side view — left

1. audio port
2. SIM card slot
3. HDMI port
4. USB 3.0 port with PowerShare
5. stylus
6. QuadCool sealed thermal chamber

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

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

3

Removing and installing components

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

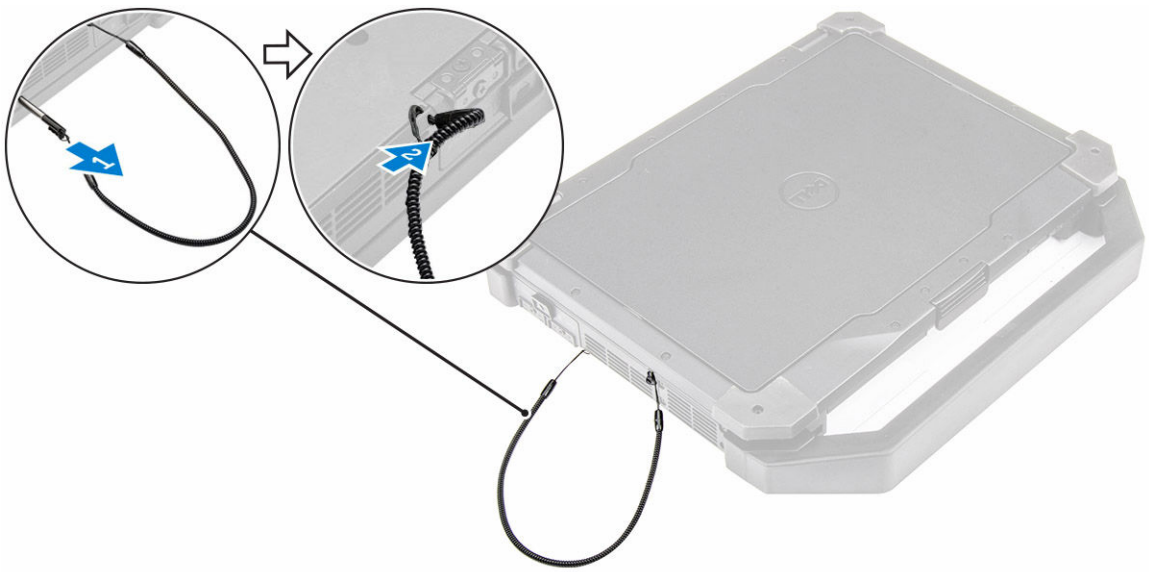
Recommended tools

The procedures in this document require the following tools:

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

Removing the stylus and tether

1. Follow the procedures in Before Working Inside Your Computer
2. To remove stylus and tether:
   a. Pull the stylus out from its slot on the computer [1].
   b. Release and remove the tether from the computer [2].



Installing the stylus and tether

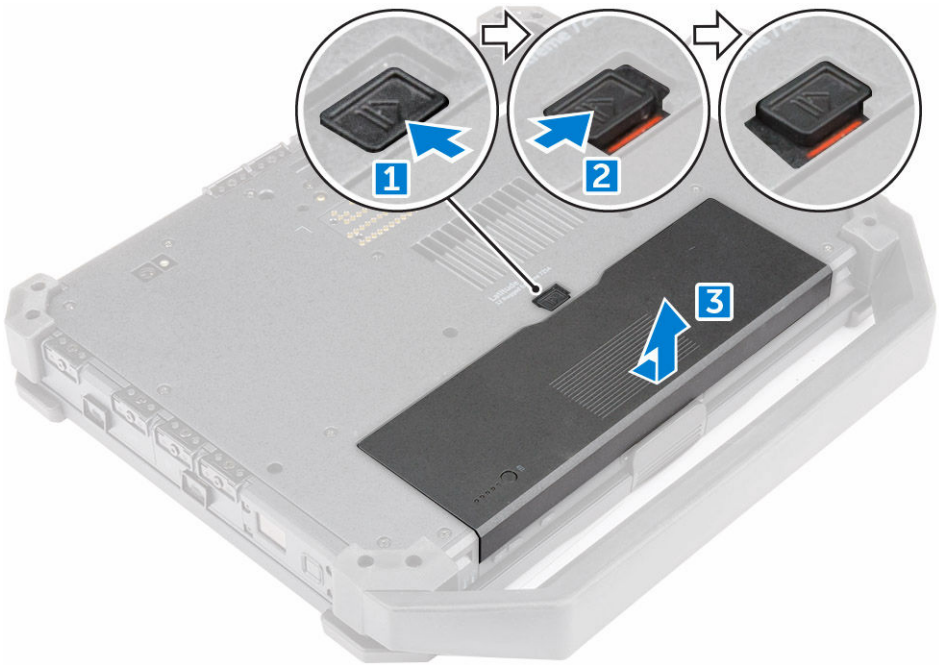
1. Insert the tether into the slot on the computer
2. Insert the stylus into its slot and push it inwards.
3. Follow the procedures in After Working Inside Your computer.

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 other computers with your computer.

WARNING: To prevent ignition in a hazardous atmosphere, batteries must only be changed or charged in an area known to be non-hazardous.

1. Follow the procedures in Before Working Inside Your Computer.
2. To remove the battery:
   a. Push the battery latch towards the back of the computer [1].
   b. Slide the latch to release the battery [2].
   c. Slide and lift the battery out of the computer [3].



Installing the battery

1. Slide the battery into the battery bay.
2. Slide the latch to lock position.
3. Follow the procedures in After Working Inside Your computer.

Removing the base cover

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove battery.
3. To remove the base cover:
   a. Remove the screws that secure the base cover [1].
   b. Lift the base cover to remove it from the computer chassis [2].

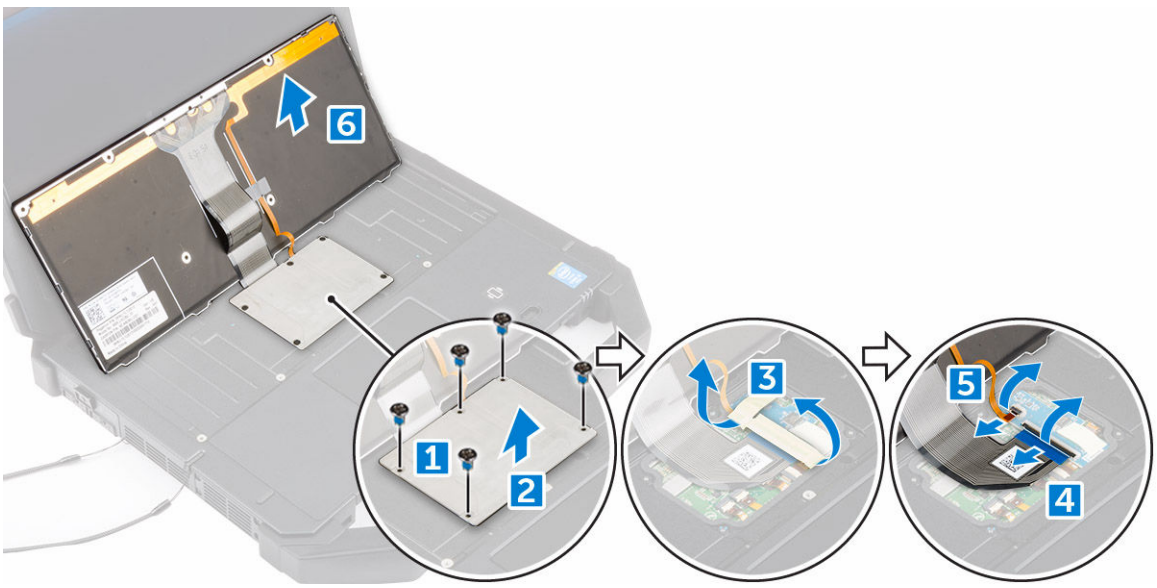
Installing the base cover

1. Place the base cover on the base of the computer.
2. Tighten the screws that secure the base cover to the computer chassis.
3. Install the battery.
4. Follow the procedures in After Working Inside Your computer.

Removing the keyboard and keyboard door

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. 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 to the display [2].

4. To remove the keyboard door:
   a. Remove the screws that secure the keyboard door [1].
   b. Lift the keyboard door [2].
   c. Remove the tape that secures the keyboard cables [3].
   d. Disconnect the keyboard cables from the system board connector by pressing the locking tab and lifting the connector [4, 5].
   e. Lift the keyboard away from the computer [6].



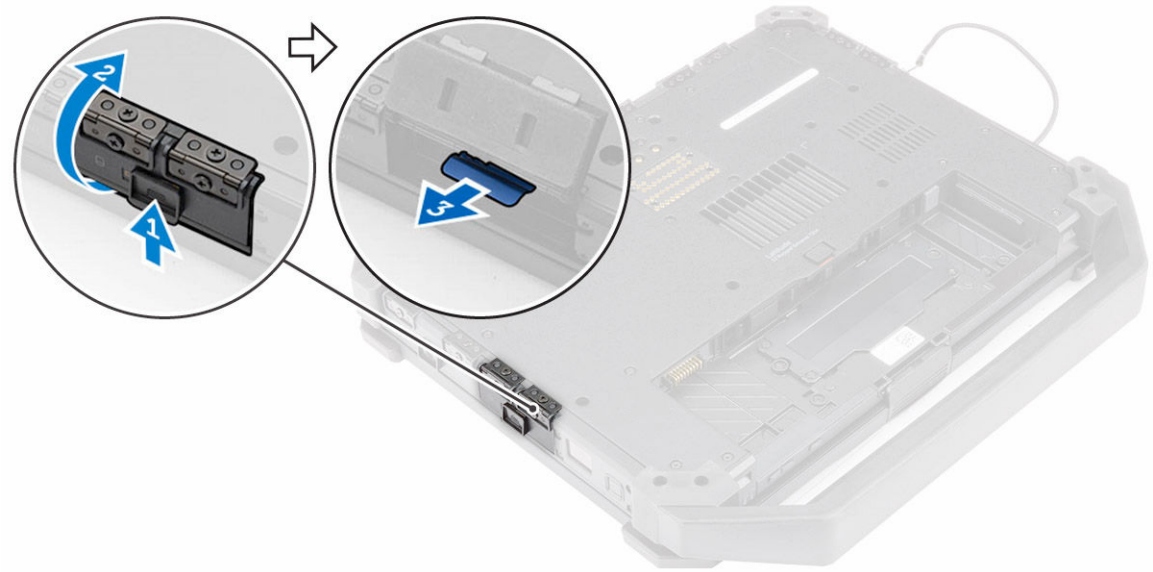
Installing the keyboard and keyboard door

1. Connect the keyboard cables to its connectors on the keyboard controller card.
2. Place the keyboard door over its slot on the computer chassis.

3. Tighten the screws that secure the keyboard door to the computer chassis.
4. Align the keyboard into its slot on the computer.
5. Tighten the screws that secure the keyboard to the computer.
6. Install the battery
7. Follow the procedures in After Working Inside Your computer.

Removing the hard drive

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove battery
3. To remove the hard drive:
   a. Unlock the hard-drive press latch door and lift it to open it [1, 2].
   b. Pull the tab to pull the hard drive out of the computer [3].



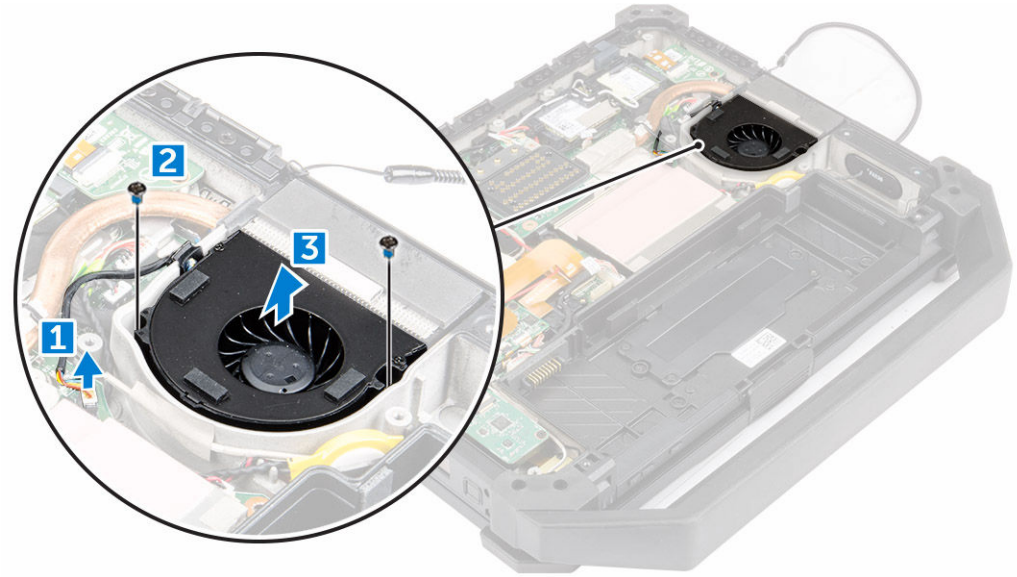
Installing the hard drive

1. Slide the hard drive into its slot on the computer.
2. Close the hard-drive bay press latch door.
3. Install battery.
4. Follow the procedures in After Working Inside Your computer.

Removing the system fan

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
3. To remove the system fan:

a. Disconnect the system fan cable from the system board [1].
b. Remove the screws that secure the system fan to the computer chassis [2].
c. Lift and remove the system fan from the computer chassis [3].



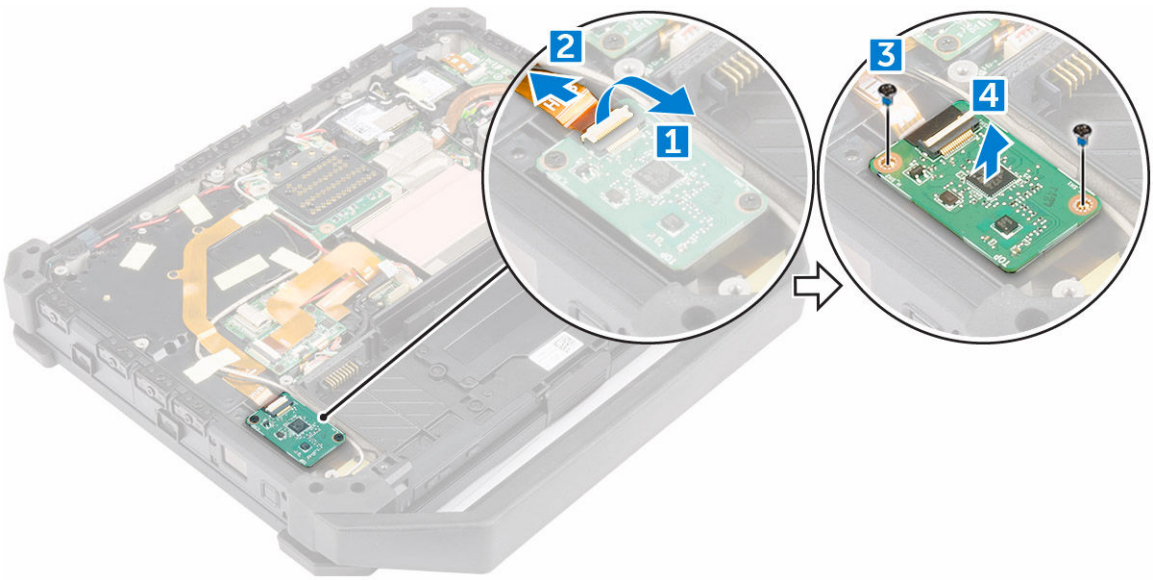
Installing the system fan

1. Align the system fan in its position in the chassis.
2. Tighten the screws that secure the system fan to the computer.
3. Connect the system fan connector cable to the system board connector.
4. Install:
   a. base cover
   b. battery
5. Follow the procedures in After Working Inside Your Computer.

Removing the Micro-Electro-Mechanical Systems (MEMS) board

NOTE: MEMS board is also known as the sensor board.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
3. To remove the MEMS board:
   a. Disconnect the cable connected to the MEMS board [1, 2].
   b. Remove the screws that secure the MEMS board to the computer chassis [3].
   c. Lift the MEMS board from the computer chassis [4].

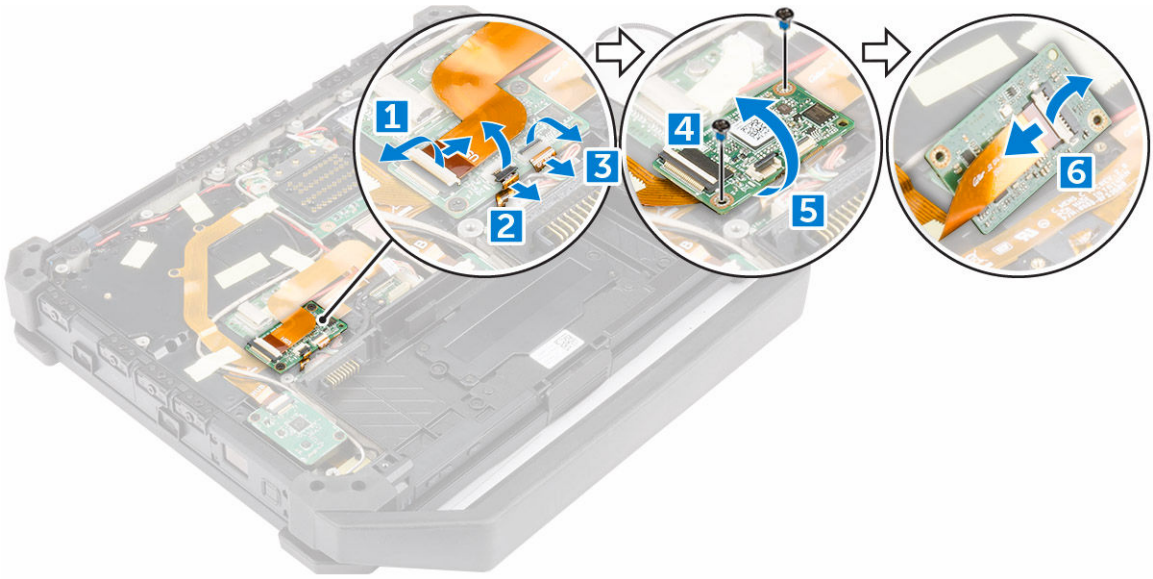


Installing the MEMS board

1. Place the MEMS board in the slot.
2. Tighten the screws that secure the MEMS board.
3. Connect the cable to the MEMS board.
4. Install:
   a. base cover
   b. battery
5. Follow the procedures in After Working Inside Your computer.

Removing the USH board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
3. To remove the USH board:
   a. Disconnect the USH board cables from the connectors [1, 2, 3].
   b. Remove the screws that secure the USH board [4].
   c. Lift and flip the board at an angle to access the smart card cable that is underneath the board [5].
   d. Disconnect the smart card cable and release the USH board from the computer chassis [6].
   e. Remove the USH board from the computer.

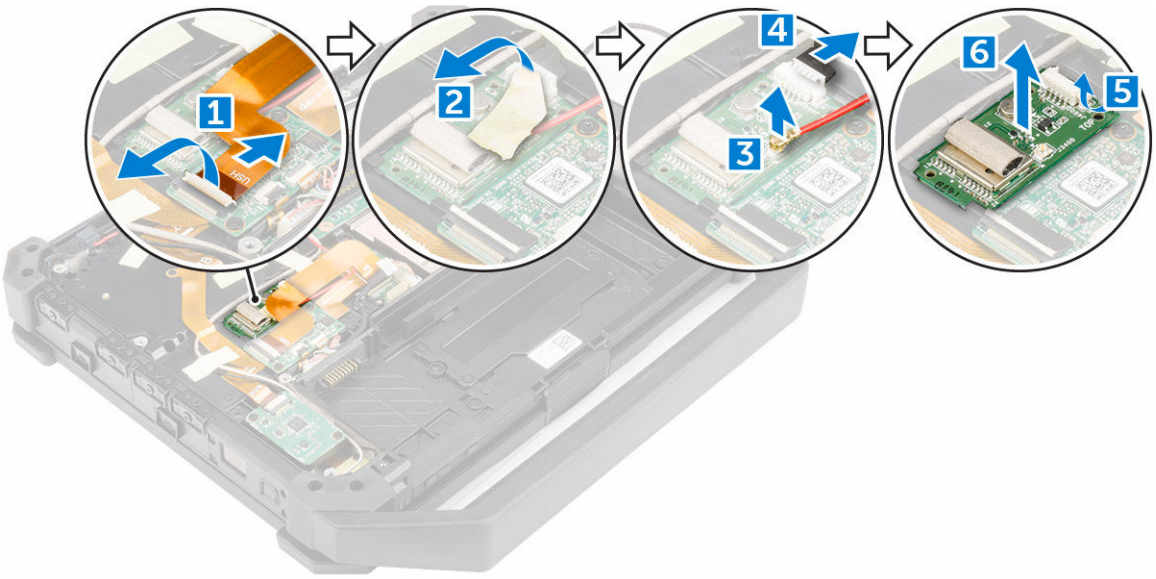


Installing the USH board

1. Connect the smart card cable to the USH board at the bottom of the board.
2. Flip the USH board to replace it to its original position.
3. Tighten the screws that secure the USH board.
4. Connect the cables to the USH board.
5. Install:
   a. base cover
   b. battery
6. Follow the procedures in After Working Inside Your computer.

Removing the Global Positioning System (GPS) module

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
3. To remove the GPS module:
   a. Disconnect the USH cable from the GPS module [1].
   b. Peel the tape that secures the GPS antenna cable [2].
   c. Disconnect the GPS antenna cable from the module [3].
   d. Disconnect the USB cable from the GPS module [4].
   e. Pry the retention latch to release the GPS module [5].
   f. Lift the GPS module from the computer chassis [6].

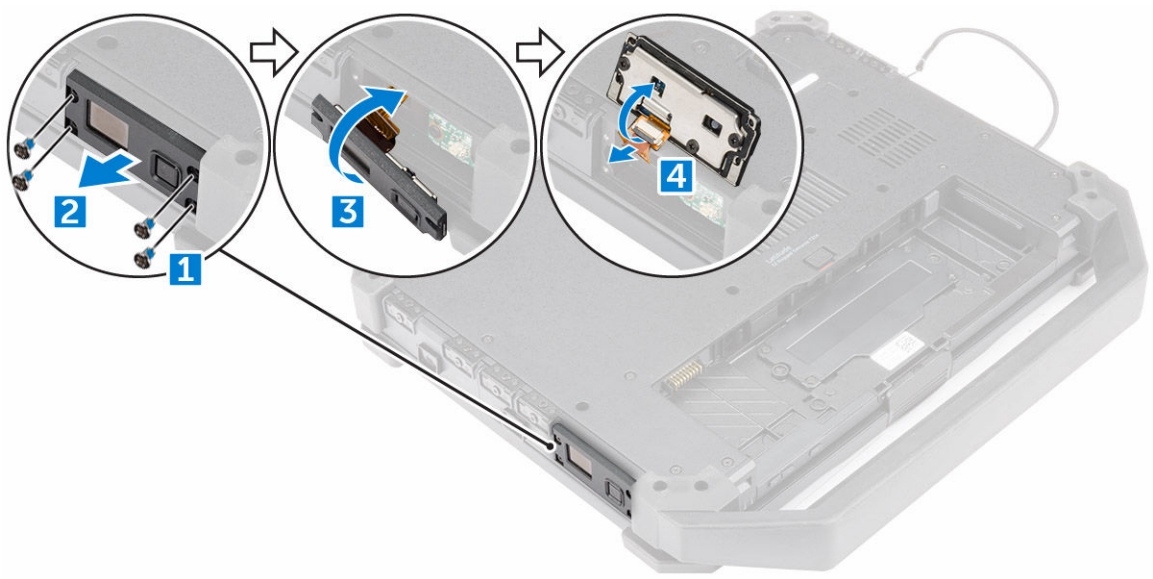


Installing the Global Positioning System (GPS) module

1. Insert the GPS module into its slot and press the latch to secure it.
2. Connect the cable to the connector on the GPS module.
3. Connect the antenna cable to the GPS module
4. Affix the tape that secures the antenna cable.
5. Connect the USH cable to the connector on the GPS module.
6. Install:
   a. base cover
   b. battery
7. Follow the procedures in After Working Inside Your Computer.

Removing the fingerprint reader

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
3. To remove the fingerprint reader:
   a. Remove the screws that secure the cover [1].
   b. Slide and lift the cover to expose the fingerprint reader board [2, 3].
   c. Disconnect the cable from the fingerprint reader board [4].

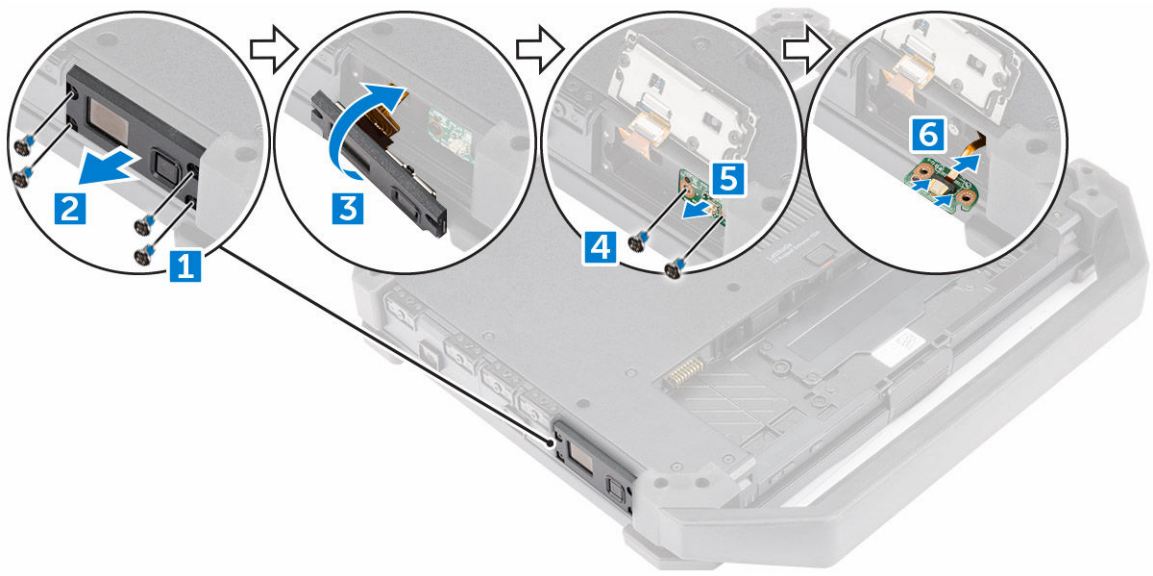


Installing the fingerprint reader

1. Insert the fingerprint reader board into the slot on the computer.
2. Connect the fingerprint reader board cable to the connector.
3. Secure the cover to fingerprint reader board by using the screws.
4. Install the:
   a. battery
5. Follow the procedure in After working inside your computer.

Removing the power button board

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
3. To remove the power button board:
   a. Remove the screws that secure the cover [1].
   b. Slide and lift the cover to access the power button board [2, 3].
   c. Remove the screws that secure the power button board [4].
   d. Slide and lift the power button board [5].
   e. Disconnect the cable from the power button board [6].



Installing the power button board

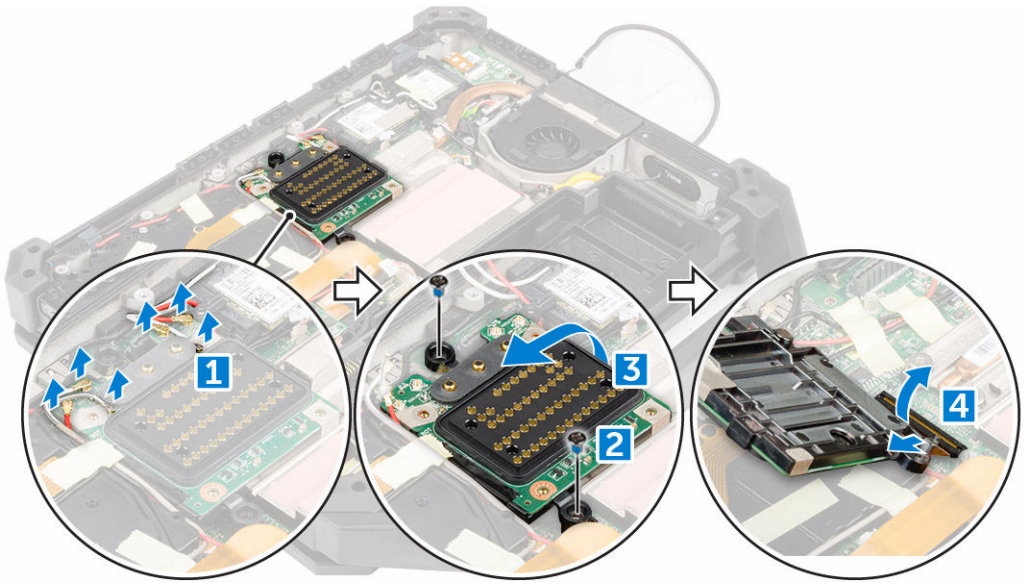
1. Align the power button board with the connector on the system board.
2. Tighten the screws that secure the power button board.
3. Connect the cable to the power button board.
4. Place the cover.
5. Tighten the screws that secure the cover.
6. Install the:
   a. battery
7. Follow the procedure in After working inside your computer.

Removing the docking board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   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 or breakage of the antenna cables.

   b. Remove the screws that secure the docking board [2].
   c. Flip the docking board [3].
   d. Disconnect the docking board connector cable from the system board by lifting the cable-release tab and lift it away from the computer chassis [4].

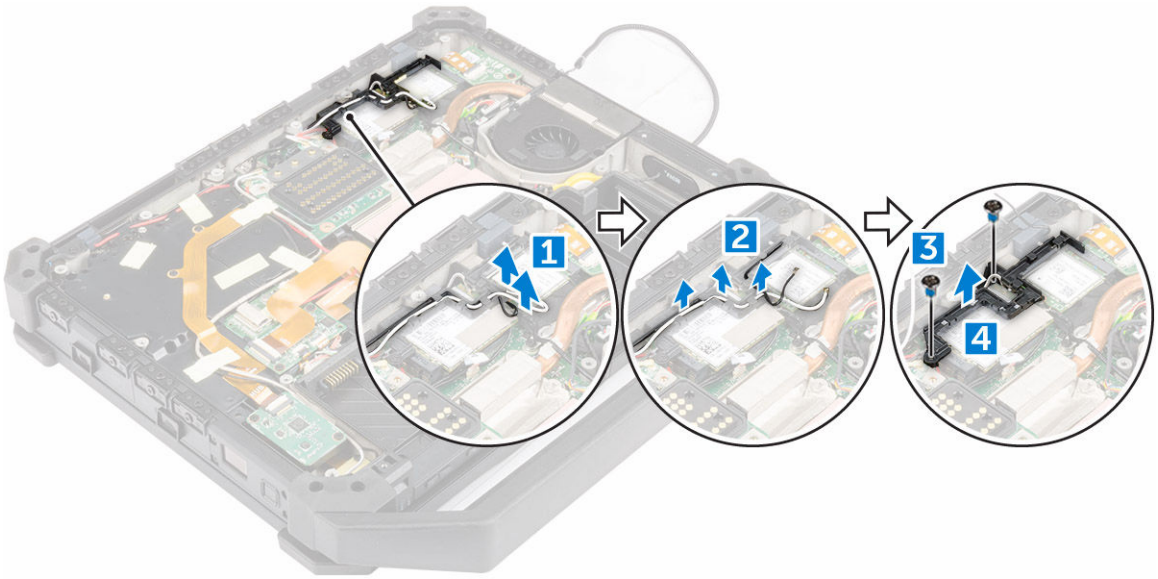


Installing the docking board

1. Connect the docking board connector cable to the system board.
2. Flip the docking board and place it on the slot.
3. Tighten the screws that secure the docking board.
4. Connect the antenna cables to the docking board.
5. Install:
   a. base cover
   b. battery
6. Follow the procedures in After Working Inside Your Computer.

Removing the antenna routing bracket

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
3. To remove the antenna routing bracket:
   a. Disconnect all the wireless antenna cables from the connectors [1].
   b. Unroute the antenna cables from the routing channel [2].
   c. Remove the screws that secure the bracket [3].
   d. Lift and remove the antenna routing bracket from the computer chassis [4].

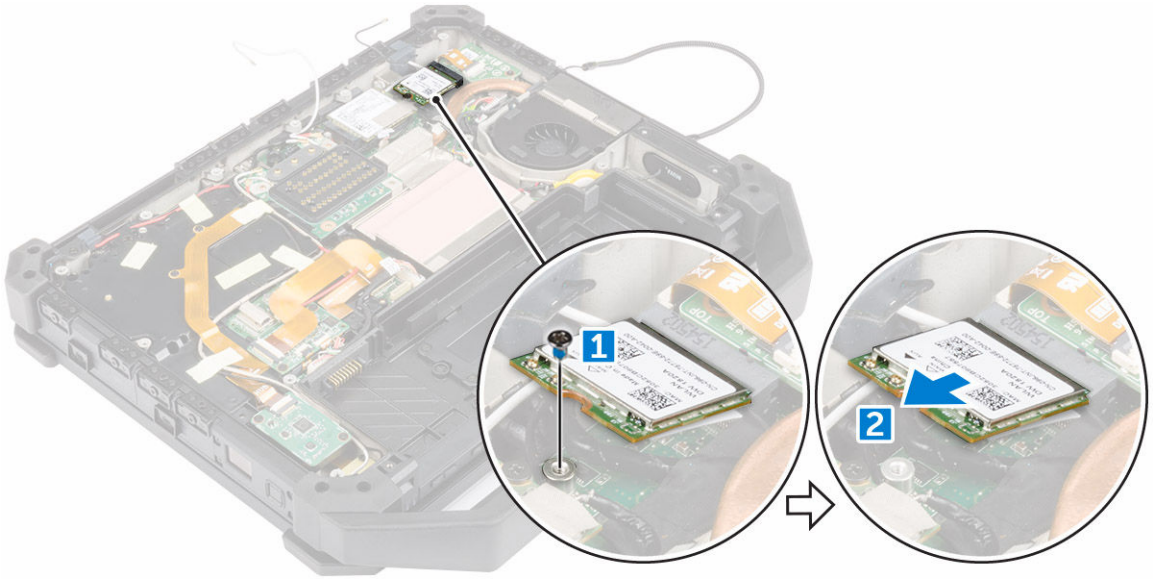


Installing the antenna routing bracket

1. Place the antenna routing bracket in the slot on the computer chassis.
2. Tighten the screws that secure the cable holder.
3. Route the antenna cables into the routing channels.
4. Connect all the wireless antenna cables to the connectors.
5. Affix the tape that secures the wireless antenna cables.
6. Install:
   a. base cover
   b. battery
7. Follow the procedures in After Working Inside Your Computer.

Removing the WLAN card

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. antenna routing bracket
3. Disconnect the antenna cables from the WLAN card.
4. To remove the WLAN card:
   a. Remove the screw that secures the WLAN card [1].
   b. Slide and lift the WLAN card from the slot [2].

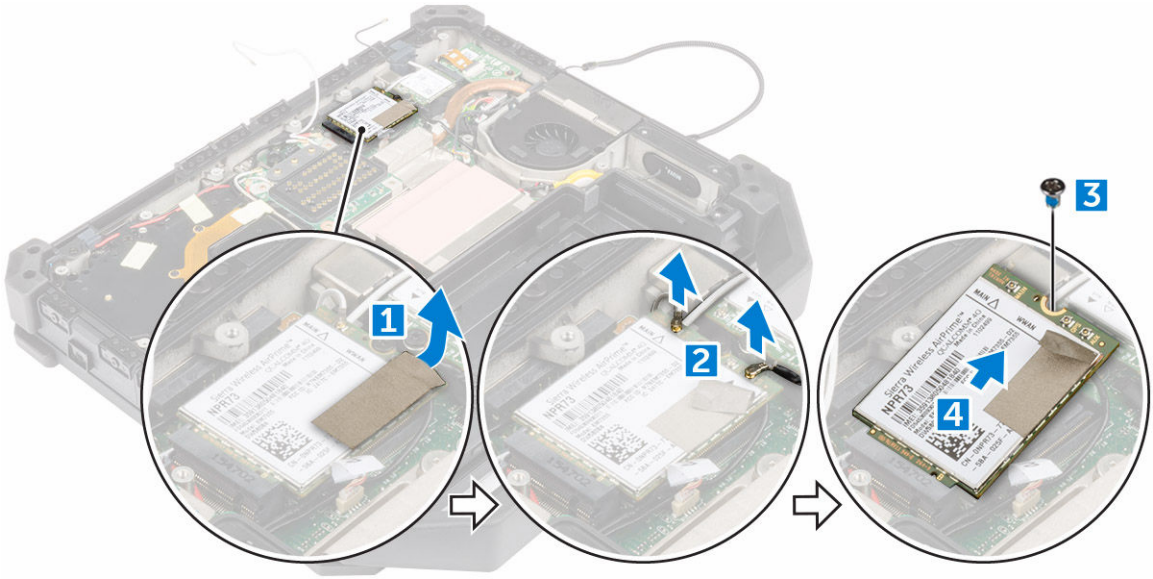


Installing the WLAN card

1. Insert the WLAN card in the slot.
2. Tighten the screw that secures the WLAN card.
3. Connect the antenna cables to the WLAN card.
4. Install:
   a. antenna routing bracket
   b. base cover
   c. battery
5. Follow the procedures in After Working Inside Your Computer.

Removing the WWAN card

1. Follow the procedures in Before Working Inside Your Computer
2. Remove:
   a. battery
   b. base cover
   c. antenna routing bracket
3. To remove the WWAN card:
   a. Peel the tape that secures the antenna cable [1].
   b. Disconnect the antenna cable from the WWAN card [2].
   c. Remove the screw that secures the WWAN card [3].
   d. Slide the card out of the card connector on the system board and remove it [4].

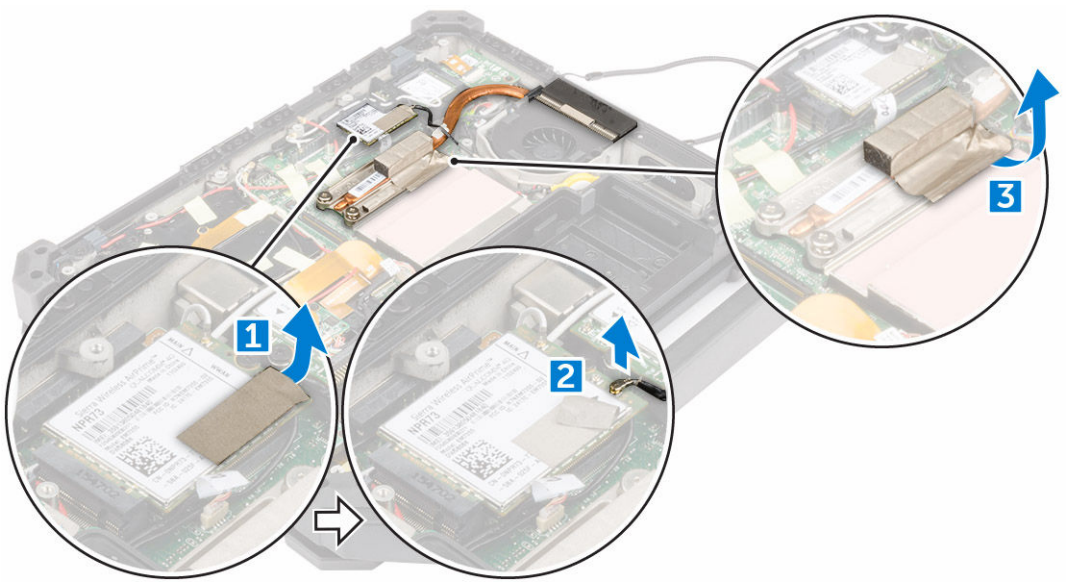


Installing the WWAN card

1. Slide the WWAN card into its connector on the system board.
2. Press the card and tighten the screw that secures the WWAN card.
3. Connect the antenna cables to the WWAN card, as per the colors on the connectors.
4. Affix the tape that secures the antenna cables.
5. Install:
   a. antenna routing bracket
   b. base cover
   c. battery
6. Follow the procedures in After Working Inside Your Computer.

Removing the heatsink

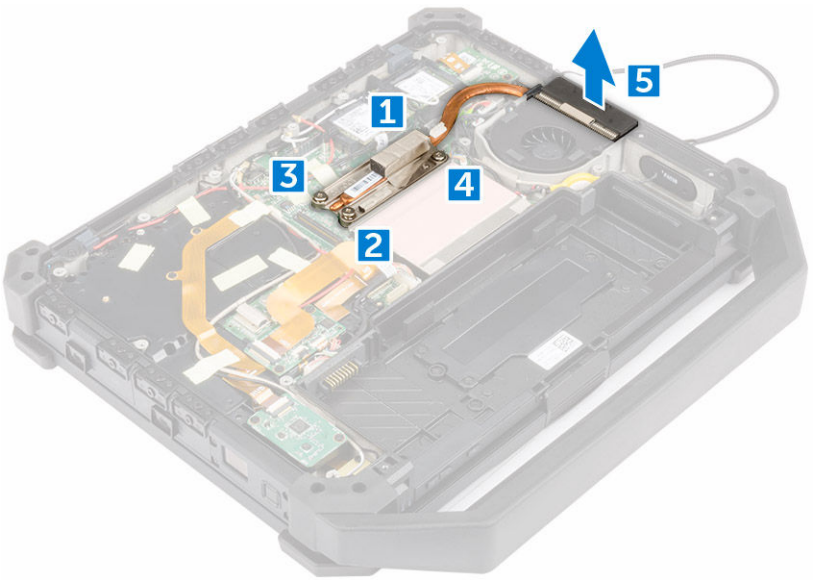
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
3. To release the heatsink:
   a. Peel the tape that secures the antenna cable [1].
   b. Disconnect the antenna cable [2].
   c. Peel the tape that secures the heatsink assembly [3].



4. To remove heatsink:
   a. Loosen the screws that secure the heatsink to the system board in the sequence shown [1, 2, 3, 4].

      NOTE: The screws are retained by the heatsink and should not be fully removed.

   b. Lift and remove the heatsink assembly from the computer chassis [5].



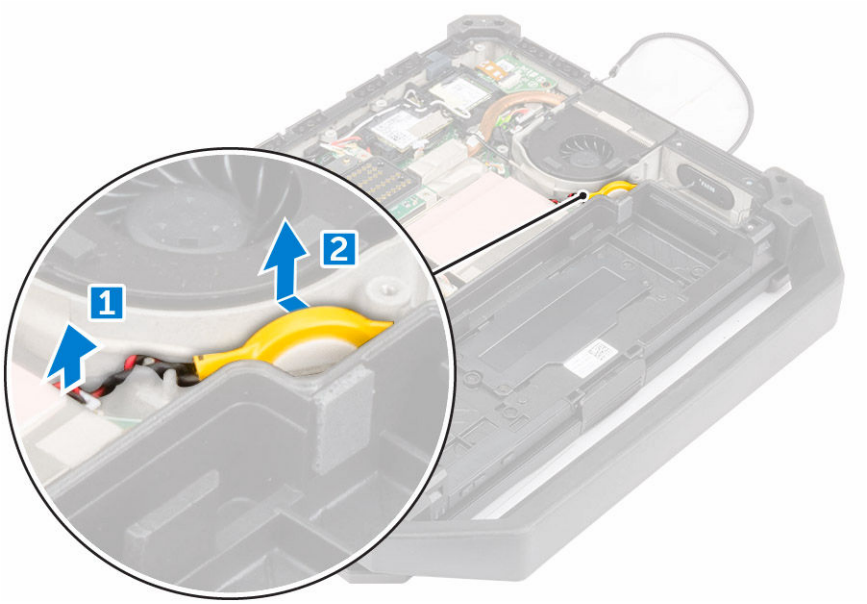
Installing the heatsink

1. Clean the old thermal grease and re-apply the grease at the base of the heatsink.
2. Align the heatsink to its position on the system board.
3. Tighten the screws in the numerical sequence depicted on the bracket, to secure the heatsink on the system board.

4. Affix the tape that secures the heatsink assembly.
5. Route the antenna cable and connect it to the connector on the WLAN card.
6. Affix the tape that secures antenna cable.
7. Install:
   a. docking board
   b. base cover
   c. battery
8. Follow the procedures in After Working Inside Your Computer.

Removing the coin cell battery

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
3. To remove the coin cell battery:
   a. Disconnect the coin cell battery cable from the system board [1].
   b. Lift and remove the coin cell battery from the computer chassis [2].

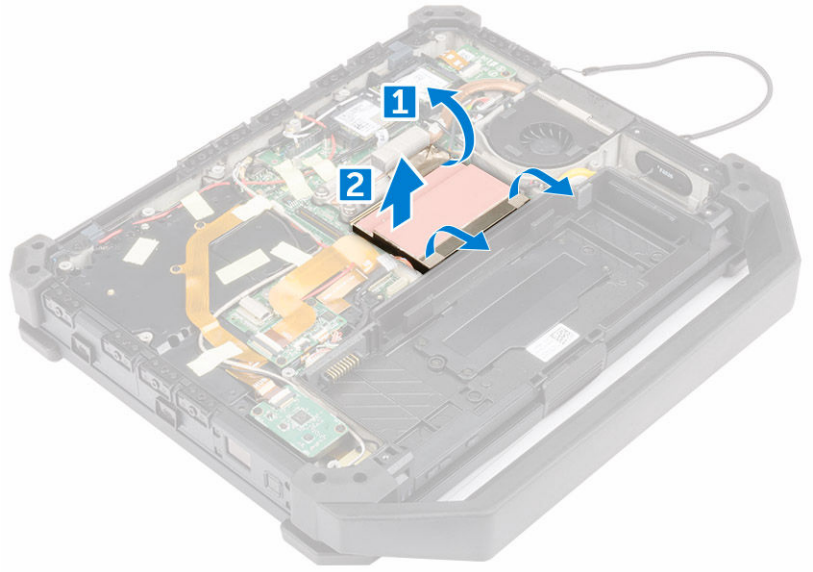


Installing the coin cell battery

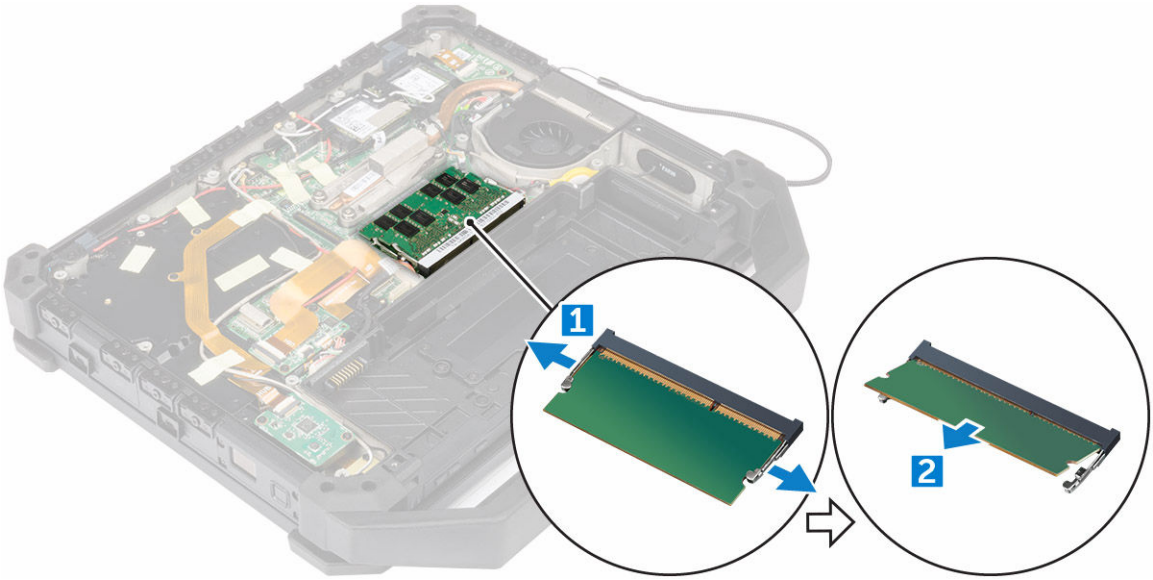
1. Connect the coin cell battery to the system board connector.
2. Insert the coin cell battery in the slot on the computer chassis.
3. Install:
   a. base cover
   b. battery
4. Follow the procedures in After Working Inside Your computer.

Removing the memory module

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
3. To remove the memory module shield:
   a. Lift the metal tabs to remove the memory module shield [1].
   b. Lift and remove the memory module shield [2].



4. To remove the memory module:
   a. Pry the securing clips away from the memory module until it pops up [1].
   b. Remove the memory module from its connector on the system board [2].

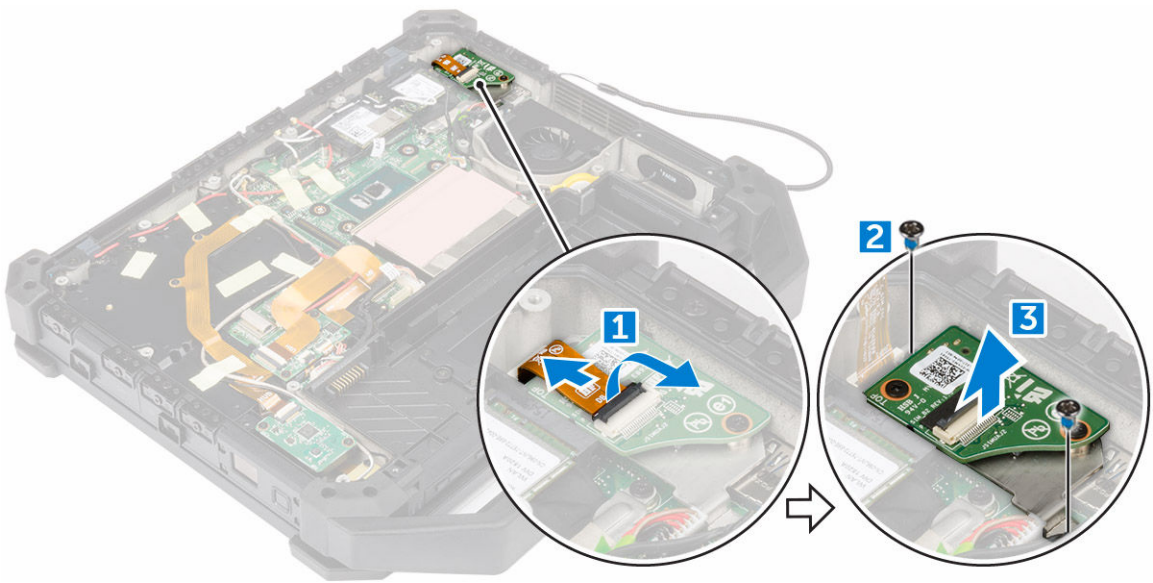


Installing the memory module

1. Insert the memory module into the memory socket.
2. Press the memory module down until it clicks into place.
3. Place the memory module shield.
4. Install:
   a. docking board
   b. base cover
   c. battery
5. Follow the procedures in After Working Inside Your computer.

Removing the SIM board

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
   b. base cover
   c. docking board
   d. heatsink
3. To remove the SIM board:
   a. Disconnect the SIM board cable by lifting the release tab [1].
   b. Remove the screws that secure the SIM board to the computer [2].
   c. Lift and remove the SIM board from the computer [3].

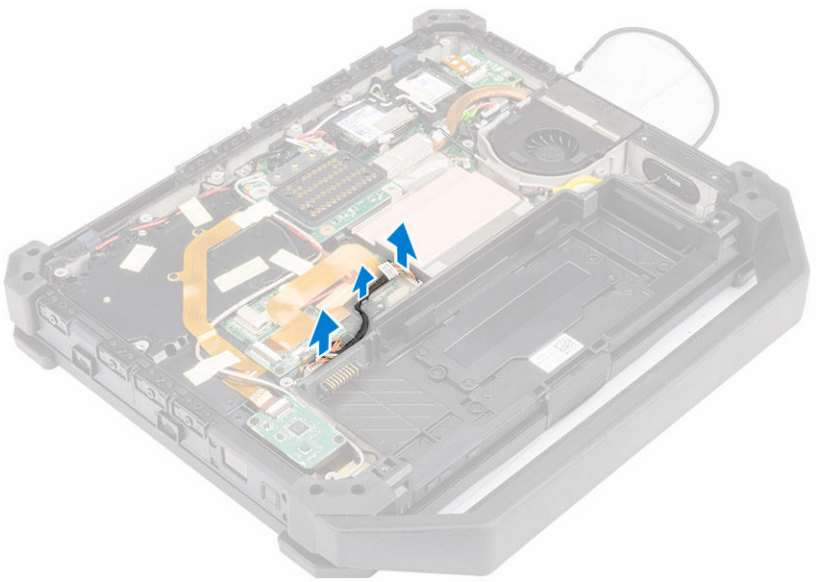


Installing the SIM board

1. Insert the SIM board into the slot on the computer.
2. Install the screws that secure the SIM board.
3. Connect the SIM board connector cable to the SIM board.
4. Install the:
   a. heatsink
   b. docking board
   c. base cover
   d. battery
5. Follow the procedure in After working inside your computer.

Removing the battery cable

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
   b. base cover
3. Disconnect the battery cable from the connector on the system board.

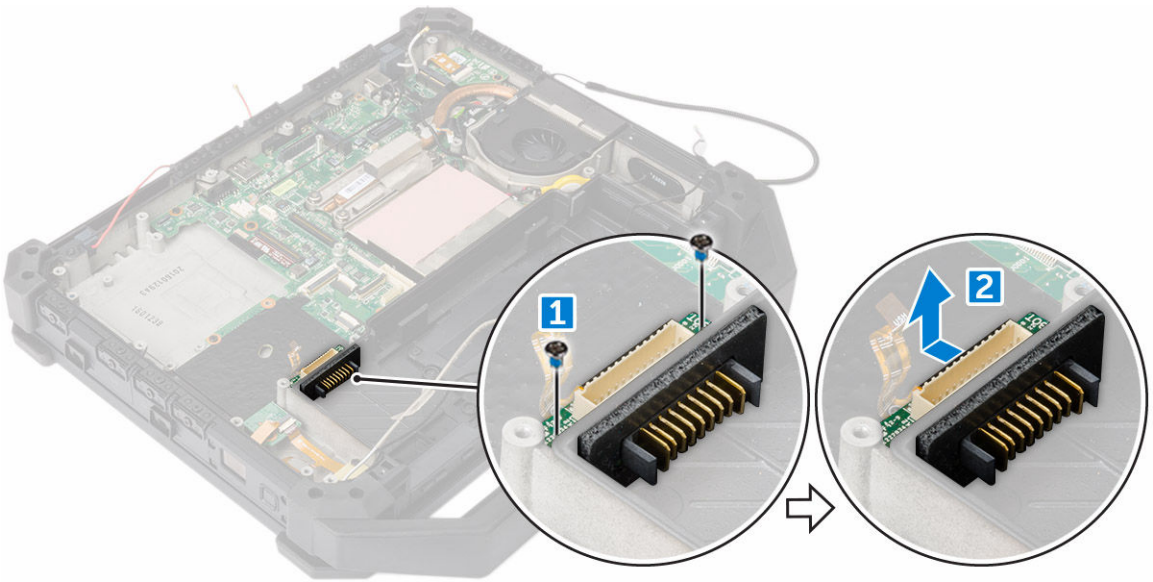


Installing the battery cable

1. Connect the battery cable to the connector on the system board.
2. Install the:
   a. base cover
   b. battery
3. Follow the procedure in After working inside your computer.

Removing the battery connector

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
   b. base cover
   c. battery cable
   d. docking board
   e. GPS module
   f. USH board
   g. MEMS board
   h. hard drive
   i. card bracket
3. To remove the battery connector:
   a. Remove the screws that secure the battery connector board to the computer [1].
   b. Lift and remove the battery connector board from the computer [2].



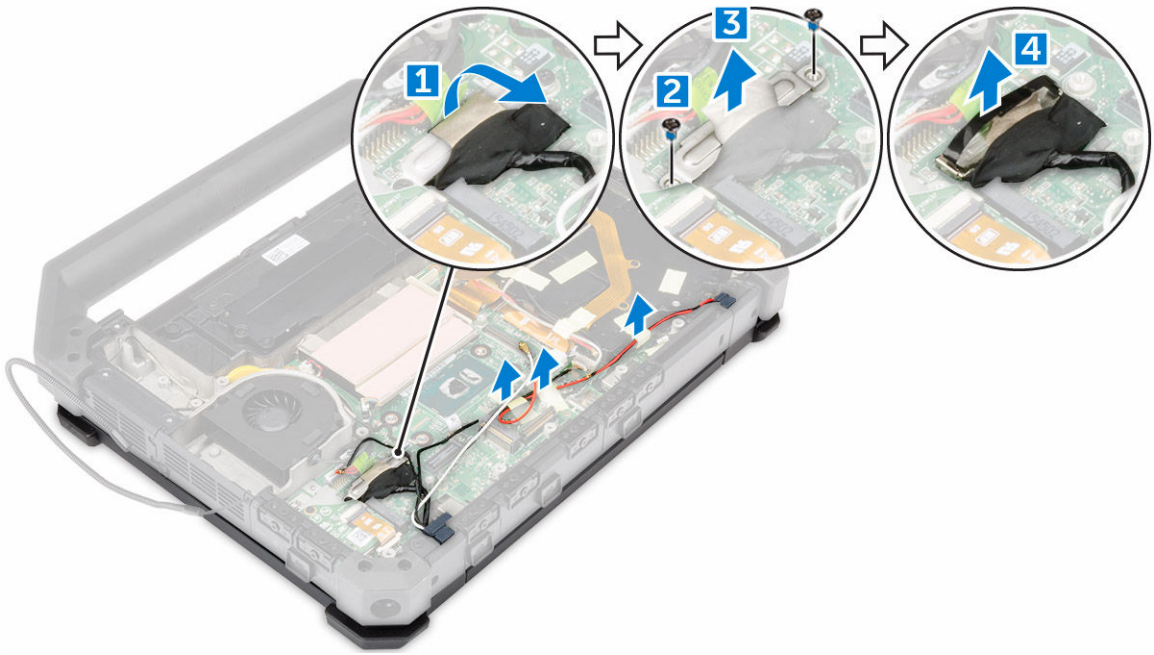
Installing the battery connector

1. Insert the battery connector board on the computer.
2. Secure the battery connector to the computer by using the screws.
3. Install the:
   a. card bracket
   b. hard drive
   c. MEMS board
   d. USH board
   e. GPS module
   f. hard drive
   g. battery cable
   h. base cover
   i. battery
4. Follow the procedure in After working inside your computer.

Removing the display cable

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
   d. antenna bracket
   e. WLAN card
   f. WWAN card
   g. heatsink
3. To remove the eDP connector and unroute the display cables:
   a. Peel the tape that secures the eDP cable [1].

b. Remove the screws that secure the eDP connector [2].
c. Lift and remove the bracket from the connector [3].
d. Disconnect the eDP cable [4].



Installing the display cable

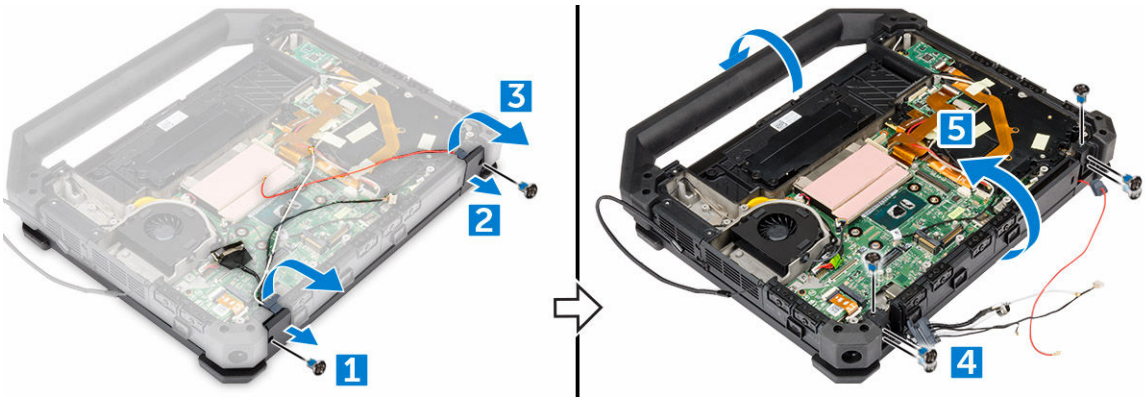
1. Install the eDP connector and place the bracket in its slot.
2. Tighten the screws that secure the eDP connector to the system board.
3. Route the cable through the routing channels.
4. Install:
   a. heatsink
   b. WWAN card
   c. WLAN card
   d. antenna bracket
   e. docking board
   f. base cover
   g. battery
5. Follow the procedures in After Working Inside Your computer.

Removing the display assembly

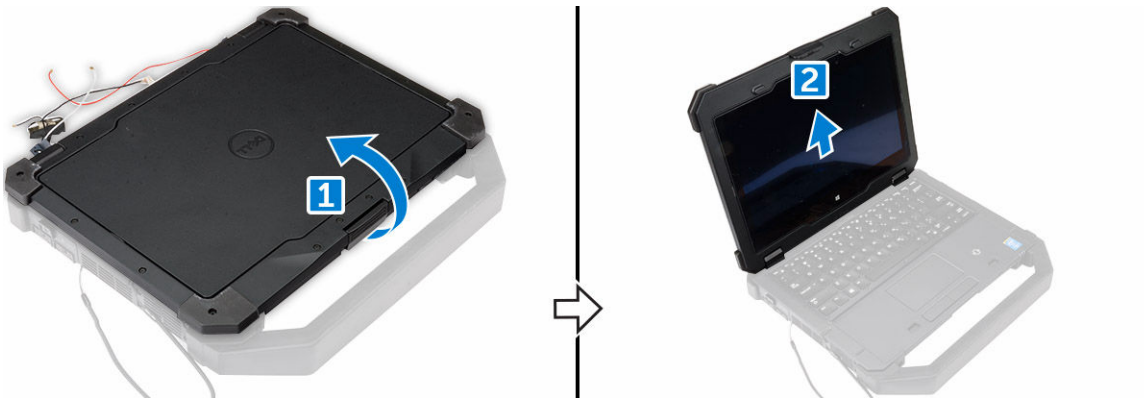
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
   d. antenna bracket

e. WLAN card
f. WWAN card
g. heatsink
h. display cable

3. To remove the hinges:
   a. Remove the screws that secure the display hinge cover [1].
   b. Lift and remove the display hinge cover [2].
   c. Lift and pull the rubber gasket to release the cables routed through the gasket [3].
   d. Remove the screws that secure the display hinges [4].
   e. Flip the computer chassis [5].



4. To remove the display assembly:
   a. Unlock the display [1].
   b. Lift the display to remove it from the computer chassis [2].



Installing the display assembly

1. Install the display assembly and close the display.
2. Flip the computer chassis.
3. Install the display hinges in their slots.
4. Tighten the screws that secure the hinges.
5. Route the cables through the rubber gasket.
6. Install the hinge cover.
7. Tighten the screws that secure the hinge cover.

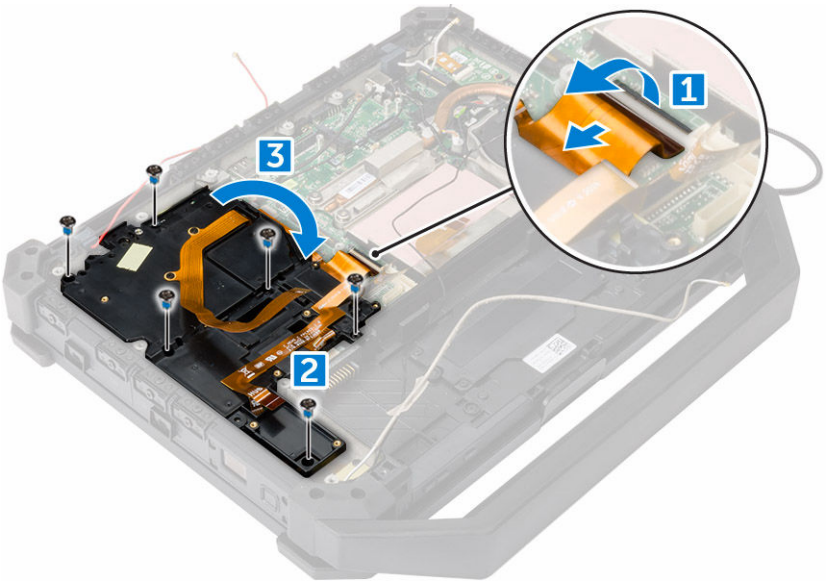
8. Install:
   a. display cable
   b. heatsink
   c. WWAN card
   d. WLAN card
   e. antenna bracket
   f. docking board
   g. base cover
   h. battery
9. Follow the procedures in After Working Inside Your computer.

Removing the card bracket

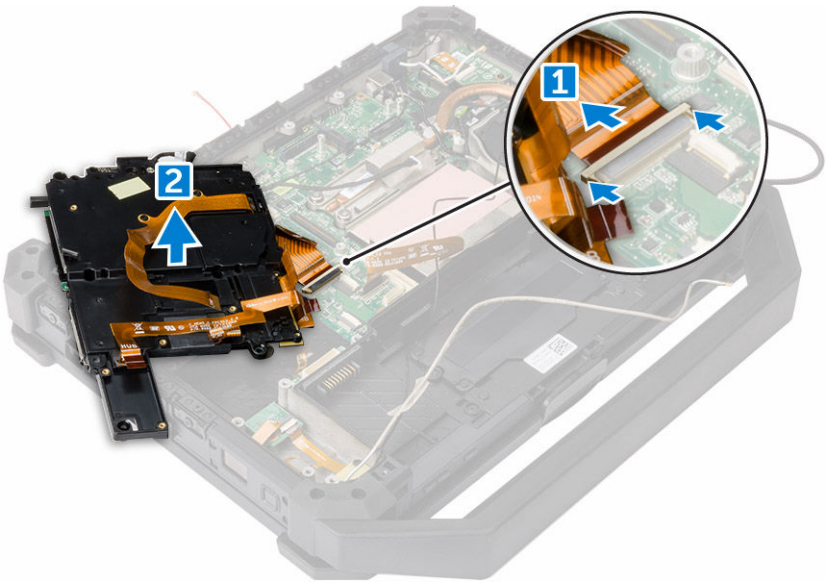
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. antenna routing bracket
   i. WLAN card
   j. WWAN card
   k. battery cable
3. Unroute the antenna cables by removing the tapes.

4. To remove the card bracket:
   a. Disconnect the cable from the connector on the system board [1].
   b. Remove the screws that secure the card bracket to the computer [2].

c. Flip the card bracket [3].



5. To remove the card bracket:
   a. Disconnect the cable from the connector [1].
   b. Lift and remove the card bracket from the computer chassis [2].



Installing the card bracket

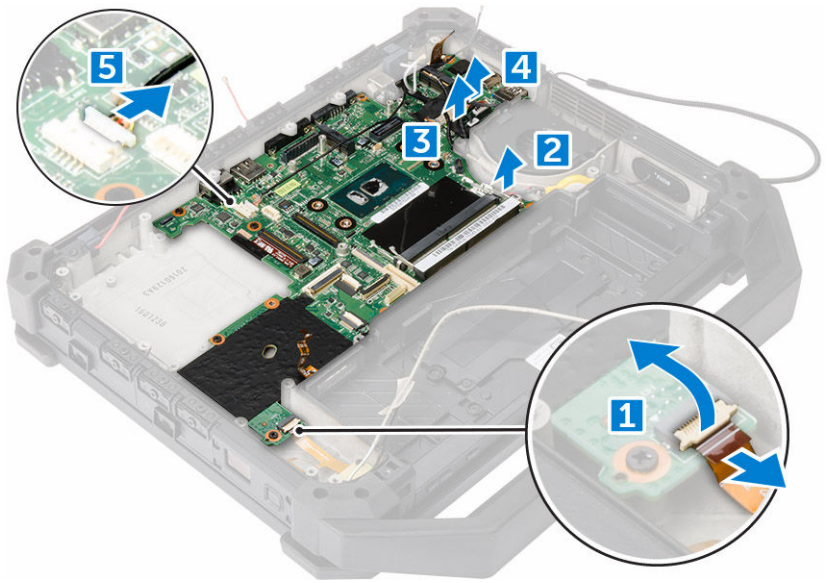
1. Place the card bracket in the slot on the computer chassis.
2. Connect the cable to the connector on the card bracket.
3. Flip the card bracket and place the card on the slot.
4. Tighten the screws that secure the card bracket.
5. Route the cables through the routing channels.

6. Connect the cables to the system board.
7. Connect the battery cable to the battery board connector on the system board.
8. Install:
   a. battery cable
   b. WWAN card
   c. WLAN card
   d. antenna routing bracket
   e. hard drive
   f. MEMS board
   g. USH board
   h. GPS module
   i. docking board
   j. base cover
   k. battery
9. Follow the procedures in After Working Inside Your Computer.

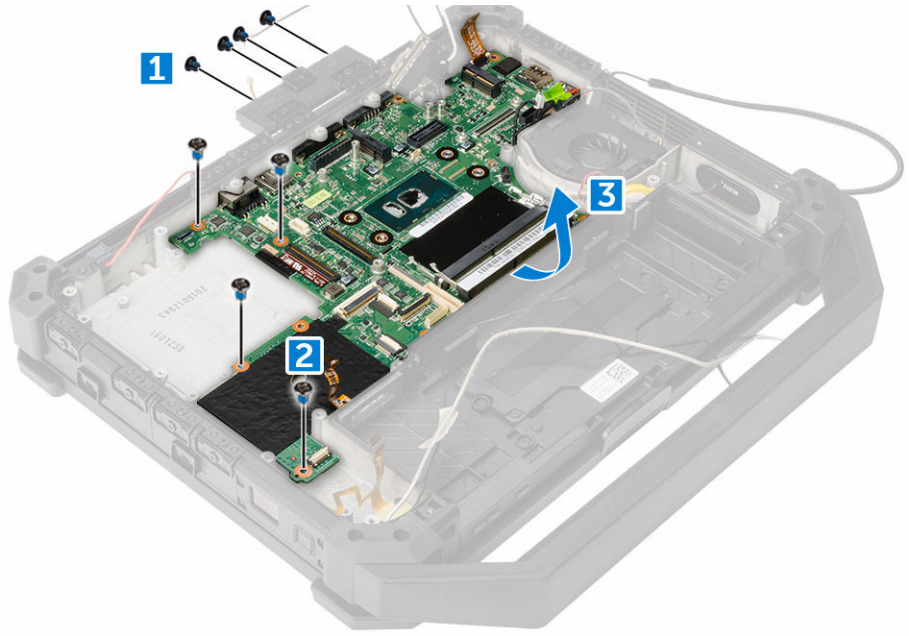
Removing the system board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
   d. USH board
   e. MEMS board
   f. hard drive
   g. battery cable
   h. card bracket
   i. memory module
   j. antenna routing bracket
   k. WLAN card
   l. WWAN card
   m. heatsink
   n. battery connector
   o. SIM Board
   p. keyboard
   q. display cable
3. Disconnect the ribbon cables from the system board [1, 2, 3, 4].

4. Disconnect the following cables from the system board:
   a. LED cable [1]
   b. coin cell battery cable [2]
   c. speaker cable [3]
   d. power connector cable [4]
   e. touch pad cable [5]



5. To remove the system board:
   a. Remove the screws that secure the DisplayPort to the computer chassis [1].
   b. Remove the screws that secure the system board [2].
   c. Slide and lift the system board from the computer chassis [3].



Installing the system board

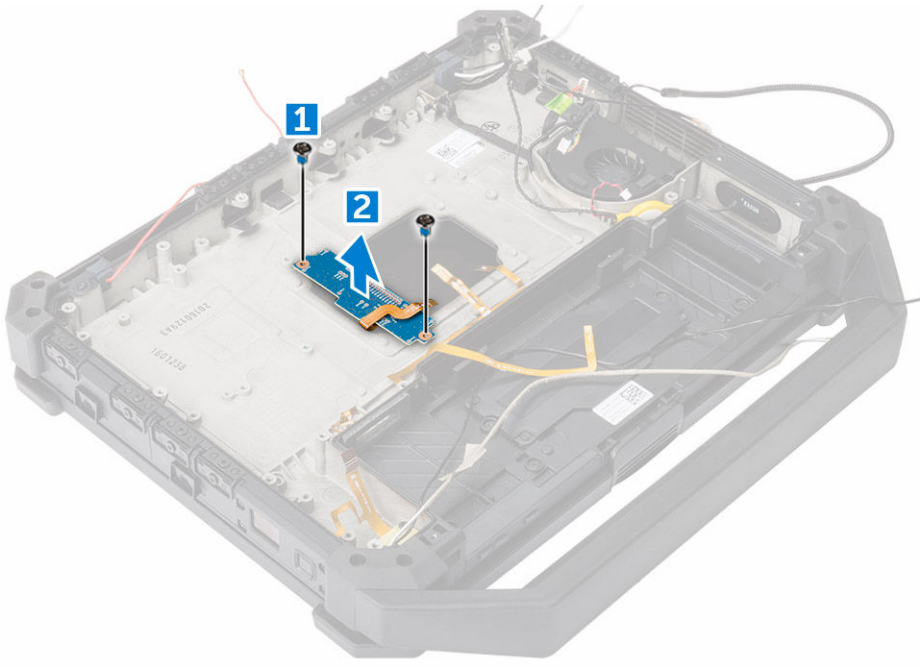
1. Place the system board to align with the connectors.
2. Tighten the screws that secure the system board to the computer chassis.
3. Tighten the screws that secure the video connector latch door.
4. Close the video connector latch door.
5. Flip the computer chassis and connect the ribbon cables to the system board.
6. Connect the following cables to the system board:
   a. LED cable
   b. coin cell battery cable
   c. speaker cable
   d. power connector cable
   e. touch pad cable
7. Install:
   a. display cable
   b. keyboard
   c. SIM board
   d. battery connector
   e. heatsink
   f. WWAN
   g. WLAN
   h. battery cable
   i. memory module
   j. antenna routing bracket
   k. card bracket
   l. hard drive
   m. MEMS board

n. USH board
o. dock board
p. base cover
q. battery

8. Follow the procedures in After Working Inside Your computer.

Removing the keyboard control board

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
   b. base cover
   c. keyboard
   d. hard drive
   e. docking board
   f. memory module
   g. heatsink
   h. ExpressCard
   i. GPS module
   j. card bracket
   k. antenna routing bracket
   l. WLAN card
   m. WWAN card
   n. SIM board
   o. system board
3. To remove the keyboard control board:
   a. Remove the screws that secure the keyboard control board [1].
   b. Lift and remove the keyboard control board module from the computer [2].



Installing the keyboard control board

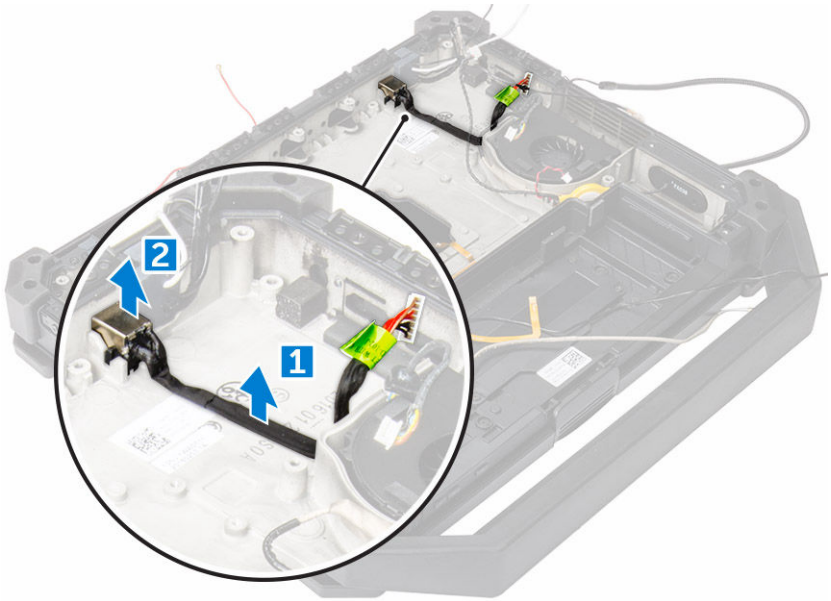
1. Align the keyboard control board with the slot on the computer.
2. Tighten the screws that secure the keyboard control board to the computer chassis.
3. Install the:
   a. system board
   b. SIM board
   c. WWAN card
   d. WLAN card
   e. antenna routing bracket
   f. card bracket
   g. GPS module
   h. ExpressCard
   i. heatsink
   j. memory module
   k. docking board
   l. hard drive
   m. keyboard
   n. base cover
   o. battery
4. Follow the procedure in After working inside your computer.

Removing the power connector

1. Follow the procedures in Before Working Inside Your Computer
2. Remove:

a. battery
b. base cover
c. docking board
d. GPS module
e. USH board
f. MEMS board
g. hard drive
h. card bracket
i. memory module
j. antenna routing bracket
k. WLAN card
l. WWAN card
m. heatsink
n. battery cable
o. battery connector
p. SIM Board
q. system board

3. To remove the power connector:
   a. Remove the power connector cable from the adhesive [1].
   b. Pull the power connector from the slot to release it from the computer chassis [2].



Installing the power connector

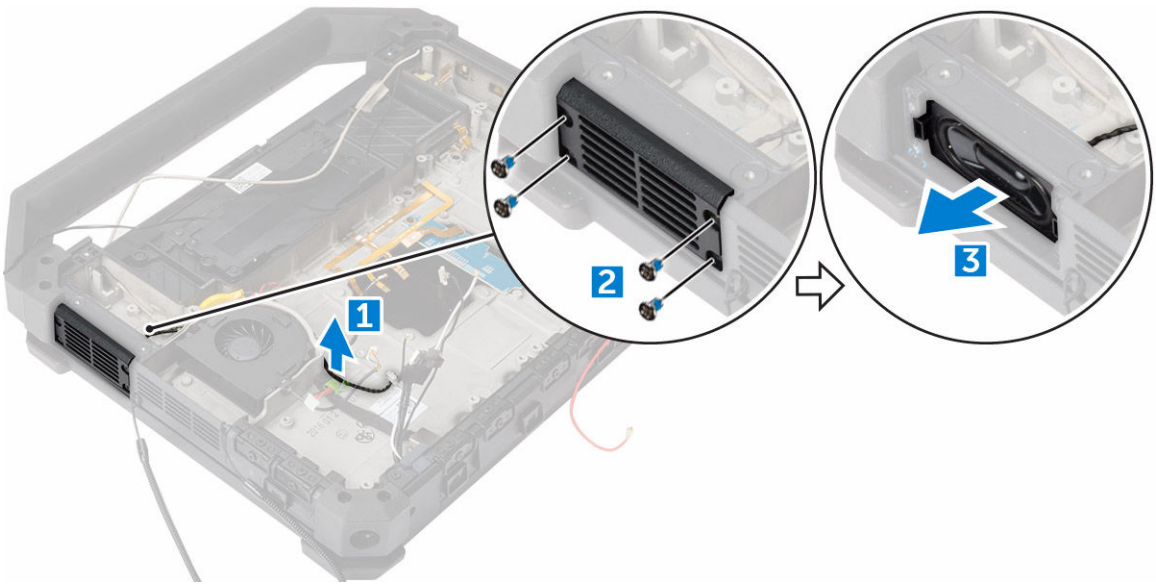
1. Insert the power connector by aligning it with the connector side with the base of the computer chassis.
2. Press to firmly secure the power connector to the computer chassis.
3. Install:
   a. system board
   b. SIM board
   c. battery connector

d. battery cable
e. heatsink
f. WWAN card
g. WLAN card
h. antenna routing bracket
i. memory
j. card bracket
k. hard drive
l. MEMS board
m. USH board
n. GPS module
o. docking board
p. base cover
q. battery

4. Follow the procedures in After Working Inside Your computer.

Removing the speaker

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. base cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. battery cable
   i. card bracket
   j. battery connector
   k. memory module
   l. antenna routing bracket
   m. WLAN card
   n. WWAN card
   o. heatsink
   p. SIM Board
   q. system board
3. To remove the speaker:
   a. Remove the speaker cable from the routing channel [1].
   b. Remove the screws that secure the speaker module to the computer chassis [2].
   c. Lift the speaker module and remove it from the computer chassis [3].



Installing the speaker

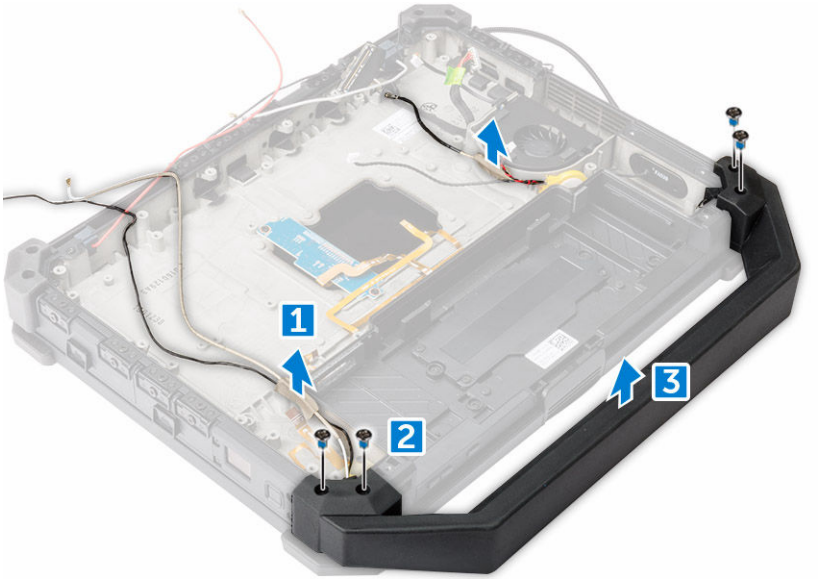
1. Place the speaker in the slot on the computer chassis.
2. Tighten the screws that secure the speaker.
3. Connect the speaker cable to the system board.
4. Install:
   a. system board
   b. SIM board
   c. heatsink
   d. WWAN card
   e. WLAN card
   f. antenna routing bracket
   g. memory
   h. card bracket
   i. battery connector
   j. battery cable
   k. hard drive
   l. MEMS board
   m. USH board
   n. GPS module
   o. docking board
   p. base cover
   q. battery
5. Follow the procedures in After Working Inside Your Computer.

Removing the handle

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:

a. battery
b. base cover
c. docking board
d. GPS module
e. USH board
f. MEMS board
g. hard drive
h. battery cable
i. battery connector
j. card bracket
k. memory module
l. antenna routing bracket
m. WLAN card
n. WWAN card
o. heatsink
p. SIM Board
q. system board

3. To remove the handle:
   a. Peel the tape that secures the cables [1].
   b. Remove the screws that secure the handle to the computer [2].
   c. Lift and remove the handle from the computer [3].



Installing the handle

1. Align the handle on the computer.
2. Secure the handle to the computer by using the screws.
3. Install the:
   a. system board
   b. SIM board
   c. heatsink

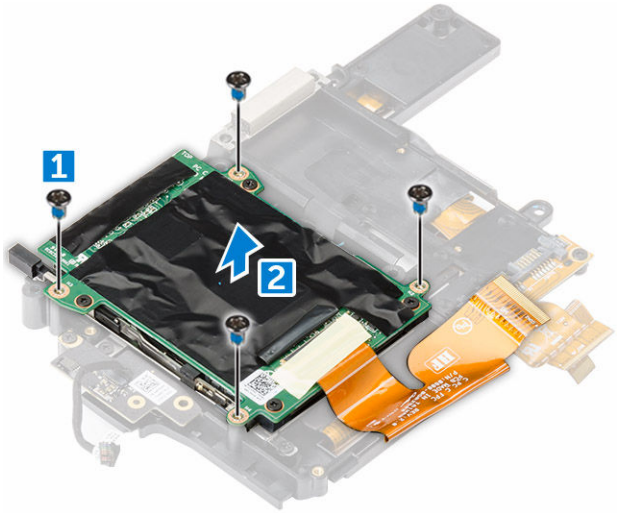
d. WWAN card
e. WLAN card
f. antenna routing bracket
g. memory module
h. card bracket
i. battery connector
j. battery cable
k. hard drive
l. MEMS board
m. USH board
n. GPS module
o. docking board
p. base cover
q. battery

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

Removing the ExpressCard module

NOTE: The ExpressCard module is on the card bracket.

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. battery
   b. base cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. antenna routing bracket
   i. WLAN card
   j. WWAN card
   k. battery cable
   l. card bracket
3. To remove the ExpressCard board:
   a. Remove the screws that secure the ExpressCard board [1].
   b. Lift and remove the ExpressCard board [2].



Installing the ExpressCard module

1. Insert the ExpressCard board into the slot.
2. Install the screws that secure the ExpressCard board.
3. Install the:
   a. card bracket
   b. hard drive
   c. MEMS board
   d. USH board
   e. GPS module
   f. hard drive
   g. antenna routing bracket
   h. WWAN card
   i. WLAN card
   j. battery cable
   k. base cover
   l. battery
4. Follow the procedure in After working inside your computer.

4

Technology and components

Processors

This laptop is shipped with the following Intel 6th generation processors:

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

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

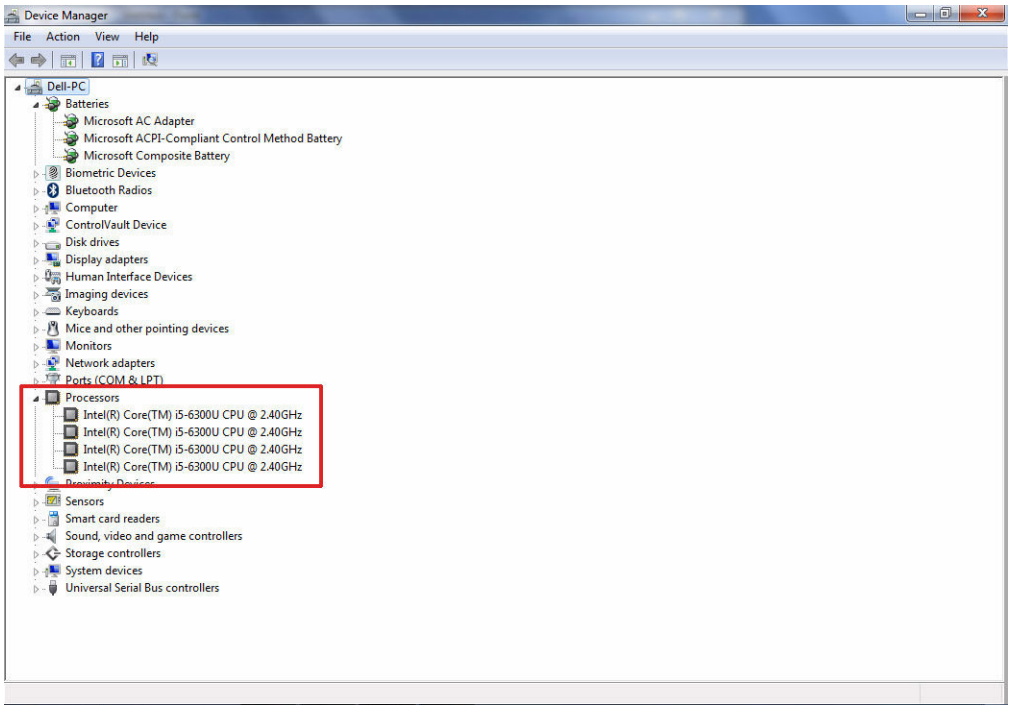
Identifying processors in Windows 10

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**.

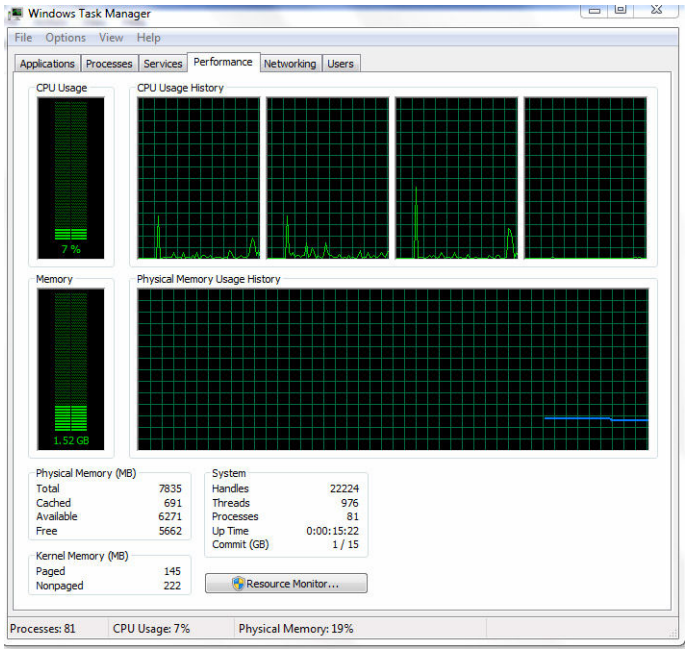
   The basic information of the processor is displayed.

Verifying the processor usage in Task Manager

1. Press and hold the taskbar.
2. Select **Start Task Manager**.

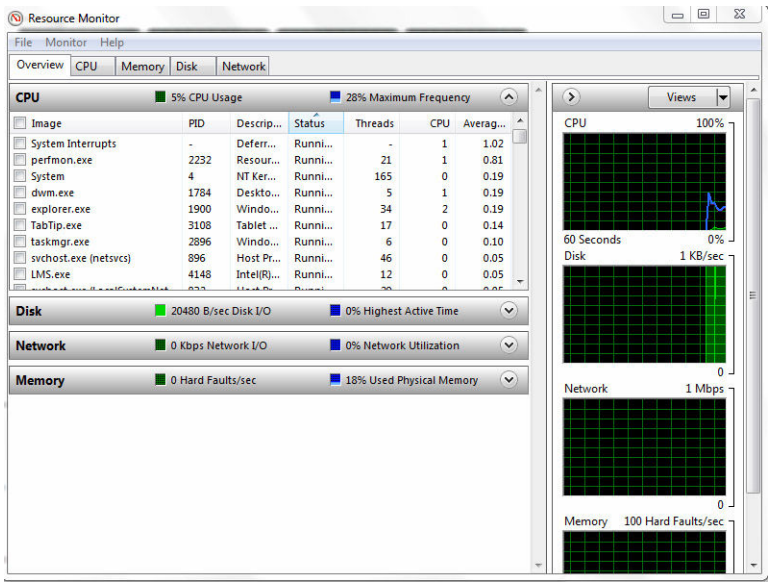
   The **Windows Task Manager** window is displayed.
3. Click the **Performance** tab in the **Windows Task Manager** window.

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 laptop communicate with the CPU through the chipset. This laptop is shipped with the Intel 100 Series chipset.

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**.

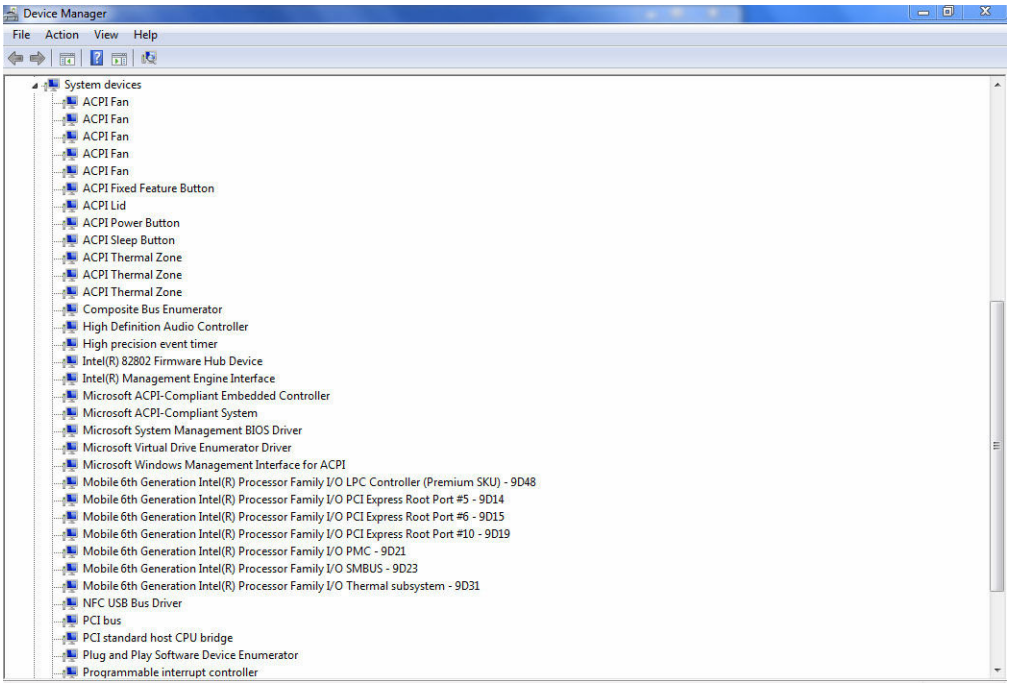
   NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your laptop model.
4. Click **Drivers and Downloads**.
5. Select the operating system installed on your laptop.
6. Scroll down the page, expand **Chipset**, and select your chipset driver.
7. Click **Download 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.

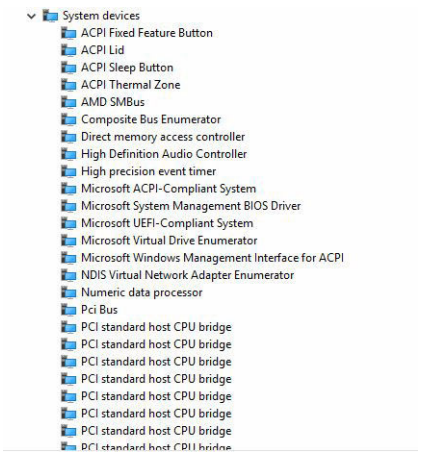
Identifying chipset in Device Manager on Windows 8

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 chipset drivers

Verify if the Intel chipset drivers are already installed in the laptop.

Table 1. Intel chipset drivers

Before installation	After installation
	

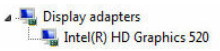
Intel HD Graphics 520

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 2. Intel HD Graphics drivers

Before installation	After installation
	

Display options

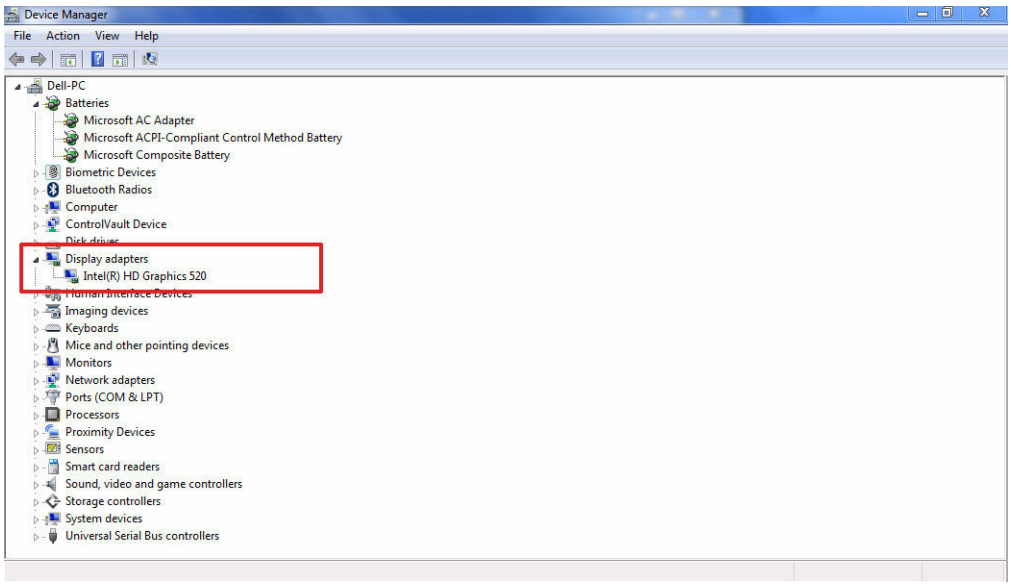
This laptop has 11.6 — inch HD with 1366 x 768 pixels resolution (maximum).

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. Press and hold on the desktop screen.

   A sub menu is displayed.
2. Select **Graphic Options** → **Rotation** and choose on 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

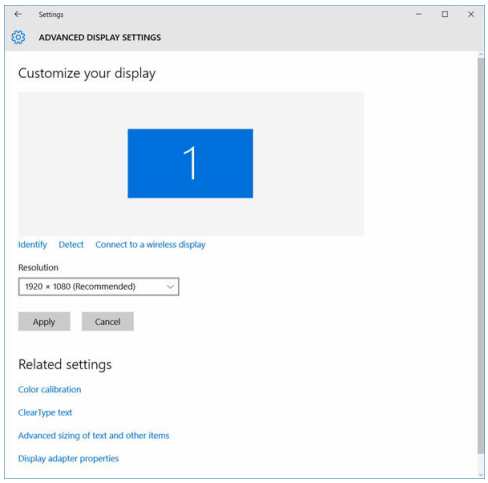
1. Turn on the laptop.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your laptop, and then click **Submit**.

   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 graphic driver to install.

7. Click **Download File** to download the graphic driver for your laptop.
8. After the download is complete, navigate to the folder where you saved the graphic driver file.
9. Double-click the graphic 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 has to be cleaned.
2. Use a microfiber cloth to remove any obvious dust and gently brush off any dirt 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 projector is turned on and plug the projector 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.

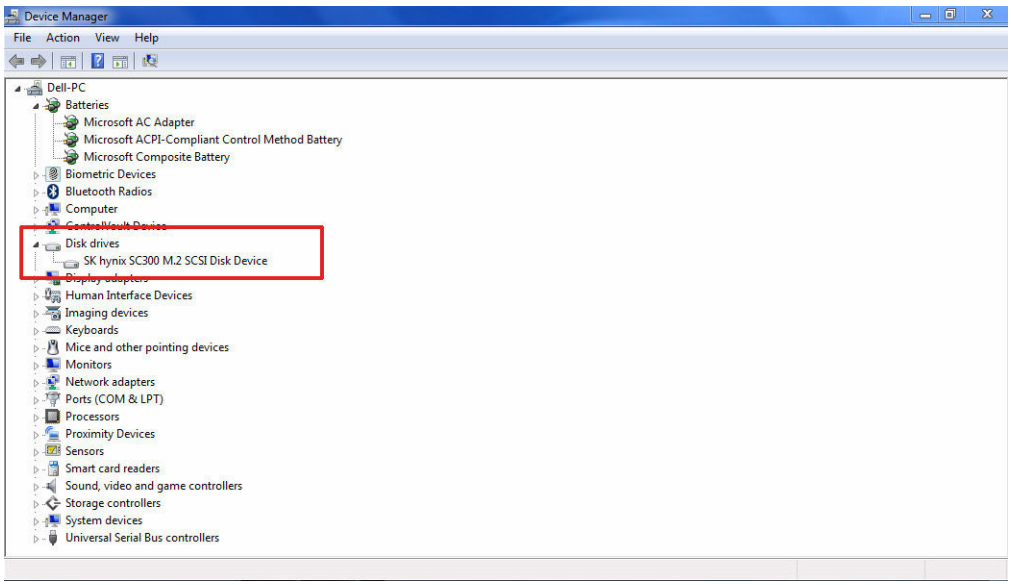
5. Select **Use your finger as an input device** to enable the touch screen. Clear the box to disable the touch screen.

Hard drive options

This laptop supports M.2 SATA drive and M.2 NVMe drive.

Identifying the hard drive in Windows 10

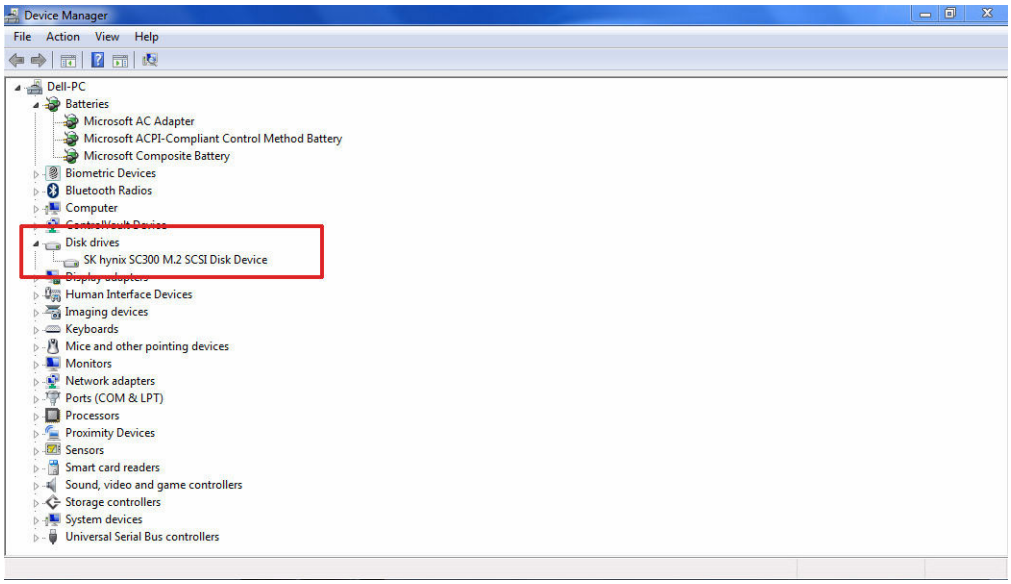
1. Tap or click **All Settings** on the Windows 10 Charms Bar.
2. Tap or click **Control Panel**, select **Device Manager** , and expand **Disk drives**.
   The hard drive is listed under **Disk drives**.



Identifying the hard drive in Windows 8

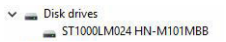
1. Tap or click **Settings** on the Windows 8 Charms Bar.
2. Tap or click **Control Panel**, select **Device Manager**, and expand **Disk drives**.

The hard drive is listed under Disk drives.



Identifying the hard drive in Windows 7

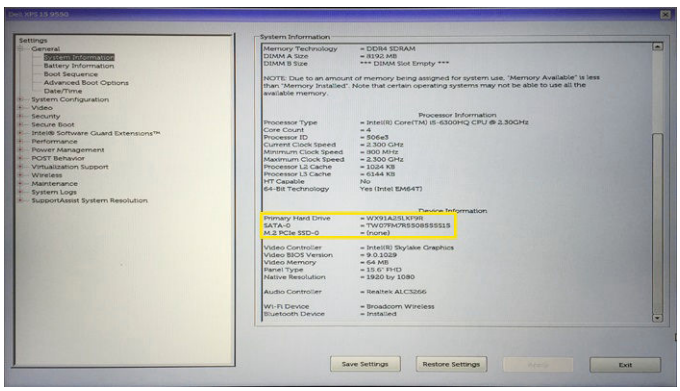
1. Click **Start** → **Control Panel** → **Device Manager**.
   The hard drive is listed under Disk drives.
2. Expand **Disk drives**.



Entering BIOS setup

1. Turn on or restart your laptop.
2. When the Dell logo appears, perform one of the following actions 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.
   - Without keyboard — When the **F12 boot selection** menu is displayed, press the Volume Down button to enter BIOS setup. To enter the Boot selection menu, press the Volume Up button.

Hard drive is listed under the **System Information** under the **General** group.



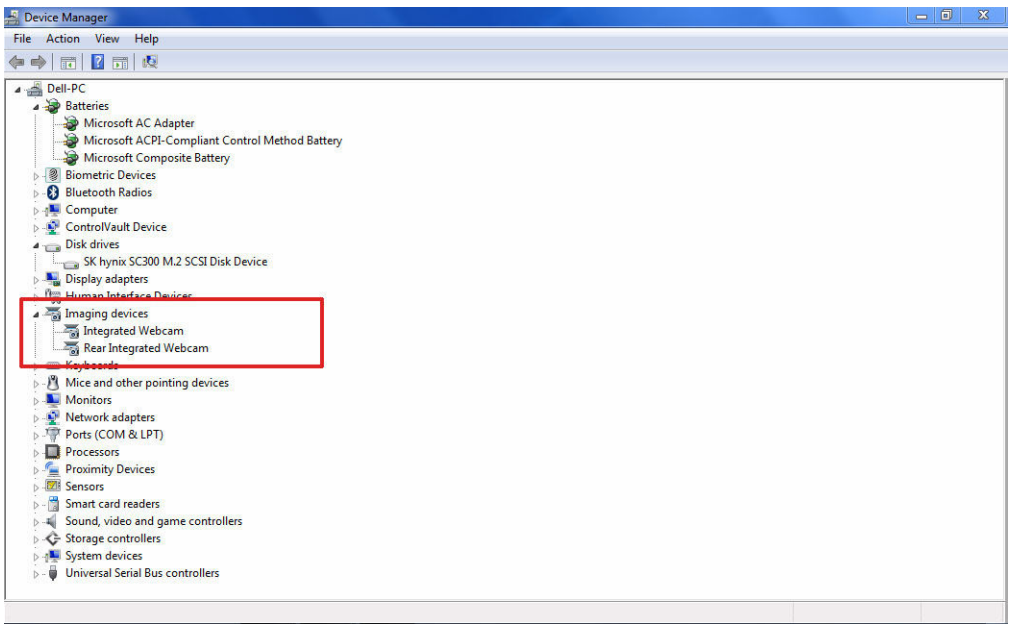
Camera features

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

This laptop also has a back-facing camera.

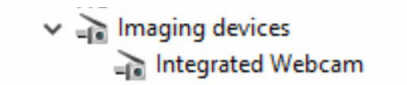
Identifying the camera in Device Manager on Windows 10

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



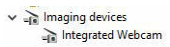
Identifying the camera in Device Manager on Windows 8

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**.

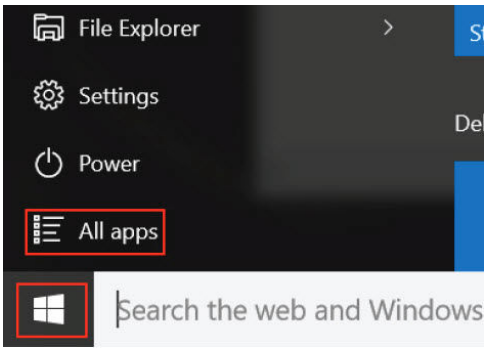


Starting the camera

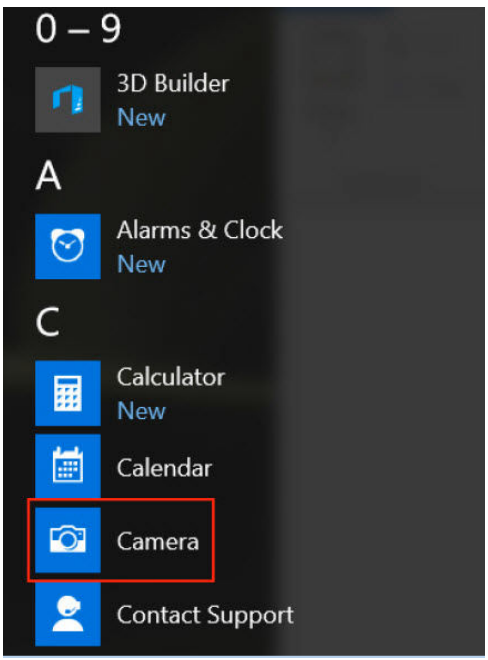
To start the camera, open an application that uses the camera. For instance, if you tap the Dell webcam central software or the Skype software that is shipped with the laptop, the camera turns on. Similarly, if you are chatting on the internet and the application requests to access the webcam, the webcam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

Starting the camera app

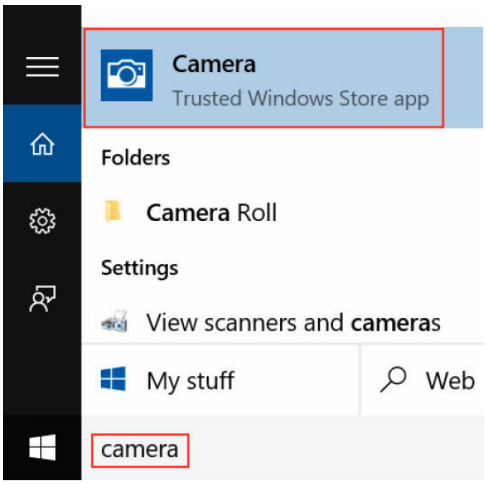
1. Tap or click the **Windows** button and select **All apps**.



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 8

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 setup

1. Turn on or restart your laptop.
2. Perform one of 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.
   - Without keyboard — When the **F12 boot selection** menu is displayed, press the Volume Down button to enter BIOS setup. To enter the Boot selection menu, press the Volume Up button.
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 laptop.
2. Perform one of the following actions after the Dell logo is displayed:
   - With keyboard — Press F2.
   - Without keyboard — Press and hold the **Volume Up** button when the Dell logo is displayed on the screen. When the F12 boot selection menu is displayed, select **Diagnostics** from the boot menu, and press Enter.

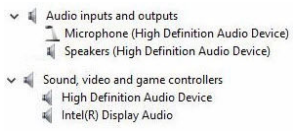
   The PreBoot System Assessment (PSA) starts on your laptop.

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

Realtek HD audio drivers

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

Table 3. Realtek HD audio drivers

Before installation	After installation
	

5

System Setup

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

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

Boot Sequence

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

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

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

- Removable Drive (if available)
- STXXXX Drive

  NOTE: XXX denotes the SATA drive number.
- Optical Drive
- Diagnostics

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

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

Navigation keys

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.

Keys	Navigation
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. NOTE: For the standard graphics browser only.
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.
F1	Displays the System Setup help file.

System Setup overview

System Setup allows you to:

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

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

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

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.

Option	Description
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**

Option	Description
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.
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.

Option	Description
	• **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.
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.

Option	Description
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 2.0 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)
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.

Option	Description
	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.

Option	Description
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.
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.

Option	Description
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.
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.

Option	Description
	• **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

Option	Description
	• 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
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

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

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

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

   NOTE: If you cannot find your Service Tag, click **Detect My Product**. Proceed with the instructions on screen.
4. If you are unable to locate or find the Service Tag, click the Product Category of your computer.
5. Choose the **Product Type** from the list.
6. Select your computer model and the **Product Support** page of your computer appears.
7. Click **Get drivers** and click **View All Drivers**.

   The Drivers and Downloads page opens.
8. On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.
9. Identify the latest BIOS file and click **Download File**.

   You can also analyze which drivers need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.

    The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.

    Follow the instructions on the screen.

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

System and setup password

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

Password type	Description
System password	Password that you must enter to log on to your system.

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

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

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

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

Assigning a system password and setup password

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

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

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

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

   Re-enter the system password when prompted.
4. Type the system password that you entered earlier and click **OK**.
5. Select **Setup Password**, type your system password and press Enter or Tab.
   A message prompts you to re-type the setup password.
6. Type the setup password that you entered earlier and click **OK**.
7. Press Esc and a message prompts you to save the changes.
8. Press Y to save the changes.
   The computer reboots.

Deleting or changing an existing system and/or setup password

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

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.

The **System Security** screen is displayed.

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

   NOTE: If you change the System and/or Setup password, re-enter the new password when promoted. If you delete the System and/or Setup password, confirm the deletion when promoted.
5. Press Esc and a message prompts you to save the changes.
6. Press Y to save the changes and exit from System Setup.

   The computer reboots.

6

Diagnostics

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

Enhanced Pre-Boot System Assessment (ePSA) diagnostics

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

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

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

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

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.

7

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**.

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

Feature	Specification
Minimum memory	4 GB
Maximum memory	32 GB

Battery specifications

Feature	Specification
Type	4-cell smart lithium ion
Depth	72.6 mm (2.85 inches)
Height	16.6 mm (0.65 inches)
Width	215 mm (8.46 inches)
Weight	318 g (0.70 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)
Interface (internal)	HD audio

Feature	Specification
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

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	one RJ45 connector
Serial port	one DB9 pin serial port
Docking port	one
USB ports	• one 4-pin USB 2.0-compliant port • one 9-pin USB 3.0-compliant port with PowerShare

Feature	Specification
	• one USB 3.0 port and memory card reader/PC card reader/ExpressCard reader (optional)
SIM card slot	one micro-SIM slot with security feature

Display specifications

Feature	Specification
Type	WLED display
Size	11.6 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

Feature	Specification
	• 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
Input voltage	100–240 V AC
Input current (maximum)	1.7 A
Input frequency	50–60 Hz
Output current	3.34 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	39 mm (1.54 inches)
Width	219 mm (8.62 inches)
Length	311 mm (12.24 inches)
Weight (minimum config)	6.0 lbs (2.72 kg)

Environmental specifications

Feature	Specifications
Temperature — operating	–29°C to 63°C (–20°F to 145°F)

Feature	Specifications
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

8

General troubleshooting

Table 4. General 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.

Issue	Suggested Troubleshooting Steps
	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.
Touch Pad and Keyboard	To troubleshoot touch pad 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.
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 that the network LEDs are responding. 3. Check System Setup to make sure that the NIC is enabled. 4. Try reseating the cable. 5. Try a known good cable, if one is available. 6. If a known good system is available, check if that system is connecting to the network. 7. 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.

9

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.