Dell Latitude 12 Rugged Extreme — 7204 Owner's Manual

Regulatory Model: P18T
Regulatory Type: P18T001

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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2014 -07

Rev. A00

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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/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

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

1. Shut down the operating system:
   - In Windows 8:
     - Using a touch-enabled device:
       a. Swipe in from the right edge of the screen, opening the Charms menu and select **Settings**.
       b. Select the and then select **Shut down**.
     - Using a mouse:
       a. Point to upper-right corner of the screen and click **Settings**.
       b. Click the and select **Shut down**.
   - In Windows 7:
     1. Click **Start**.

2. Click **Shut Down.**

or

1. Click **Start** .
2. Click the arrow in the lower-right corner of the **Start** menu as shown below, 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.

After Working Inside Your Computer

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

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

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

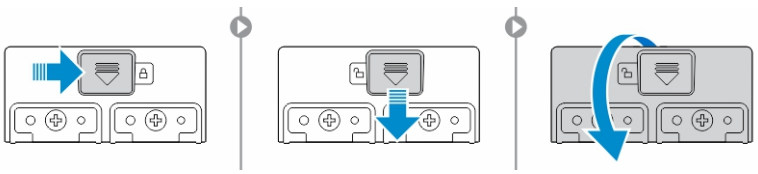
   CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.
3. Replace the battery.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

Opening the Press-Latch Doors

There are six press-latch doors. Three on the back and two on the right side panel. An extra press-latch door is also present on the left side of the computer.

To open the press-latch doors:

a. Left and right side press-latch doors: Slide the latch towards the back of the computer to lock and towards the front to unlock.
b. Back press-latch door: Slide the latch to the right to lock and to the left to unlock.
c. Press down the latch and pull the door in the direction away from the computer.



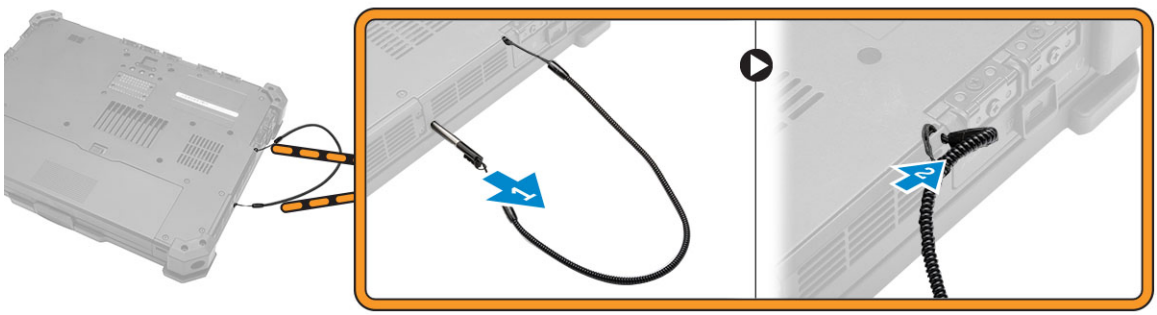
2

Removing and Installing Components

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

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 it's 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

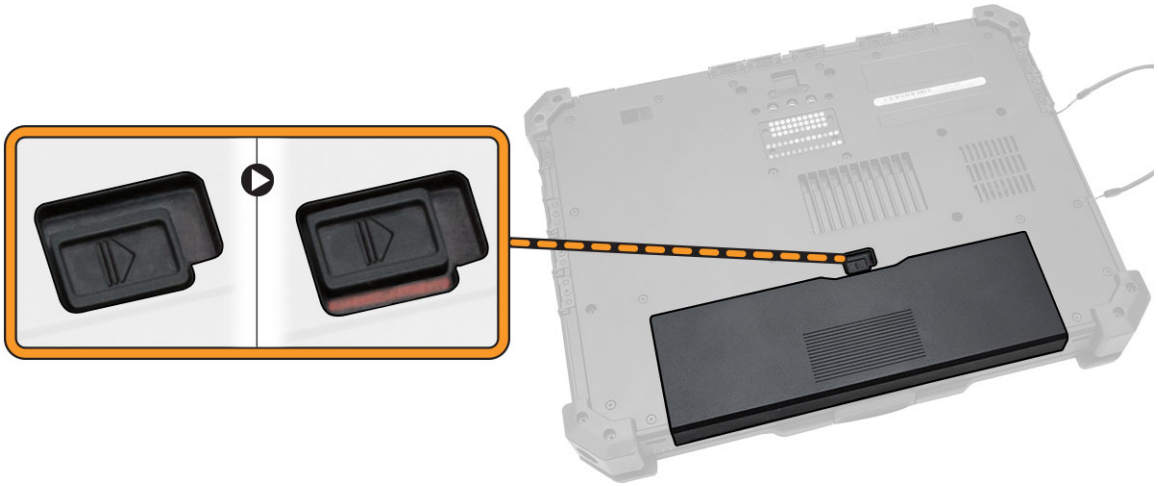
WARNING: Using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell. The battery is designed to work with your Dell computer. Do not use a battery from other computers with your computer.

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

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.
   b. Slide the latch to release the battery.
   c. Slide the battery out of the computer.

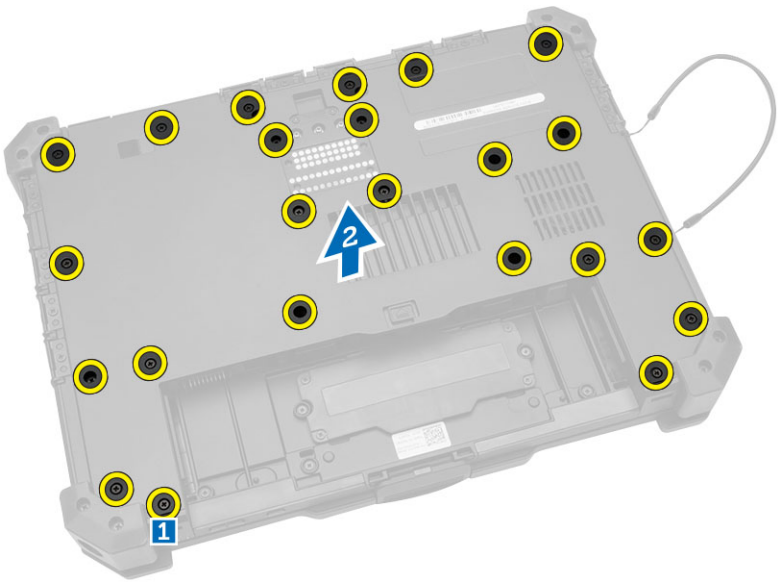


Installing the Battery

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 Bottom Cover

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

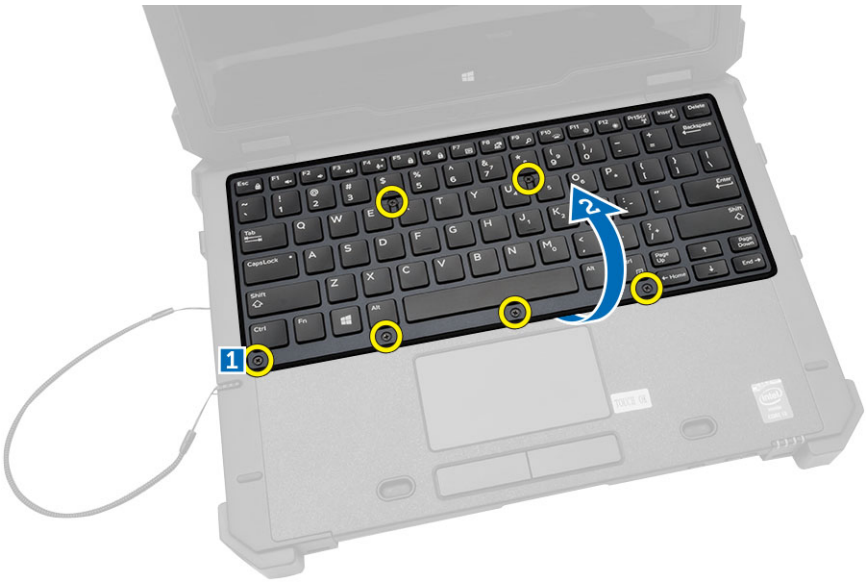


Installing the Bottom Cover

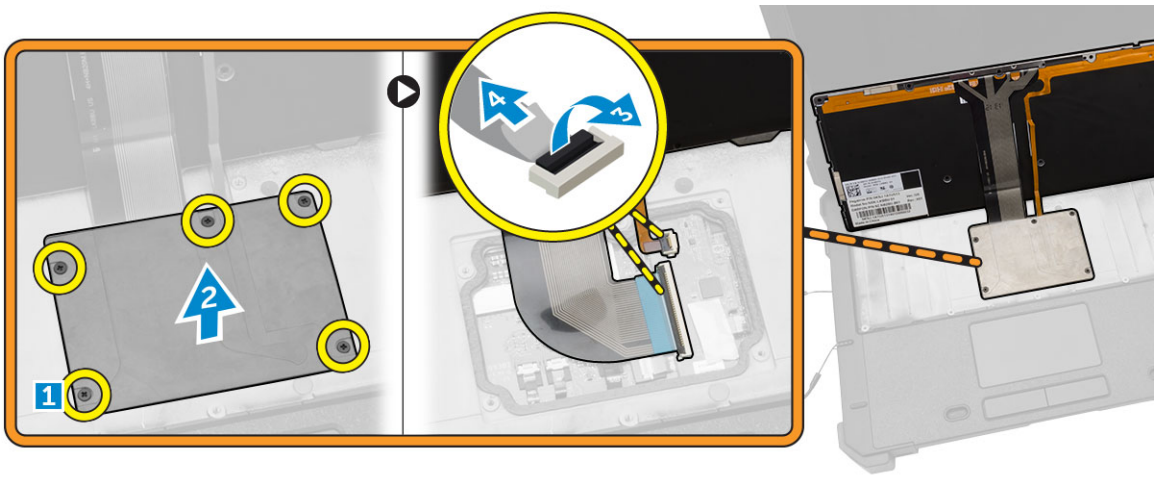
1. Place the bottom cover on the base of the computer.
2. Tighten the screws that secure the bottom cover to the computer chassis.
3. Install the battery.
4. Follow the procedures in After Working Inside Your computer.

Removing the Keyboard and Keyboard door

1. Follow the procedures in Before Working Inside Your Computer.
2. 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 [2].



3. To remove the keyboard door:
   a. Remove the screws that secure the keyboard door [1].
   b. Lift the keyboard door [2].
   c. Disconnect the keyboard cables from the motherboard connector by pressing on the locking tab and lifting the connector upwards [3,4].
   d. Lift and remove the keyboard from the computer chassis.

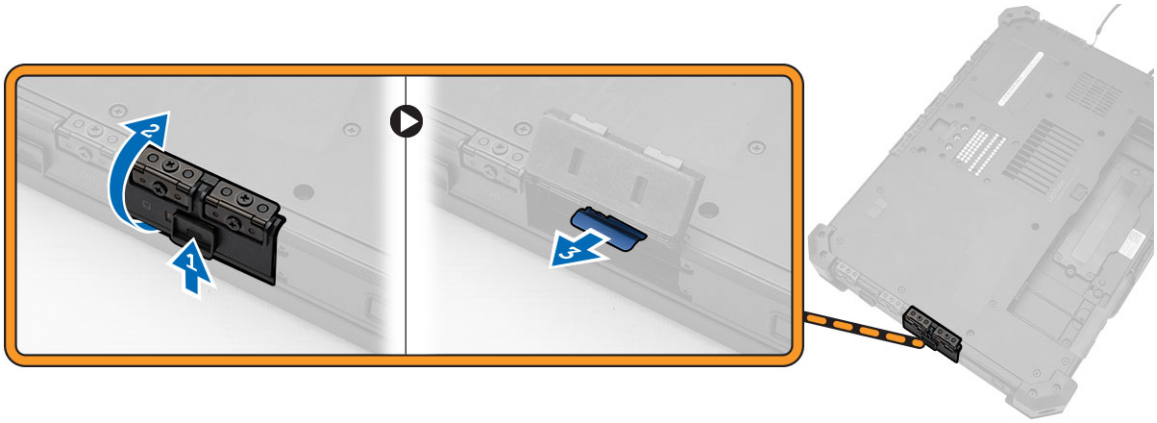


Installing the Keyboard and Keyboard Door

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 to secure the keyboard to the computer.
6. 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 upwards to open it [1,2].
   b. Pull the tab to pull the hard drive out of the computer [3].

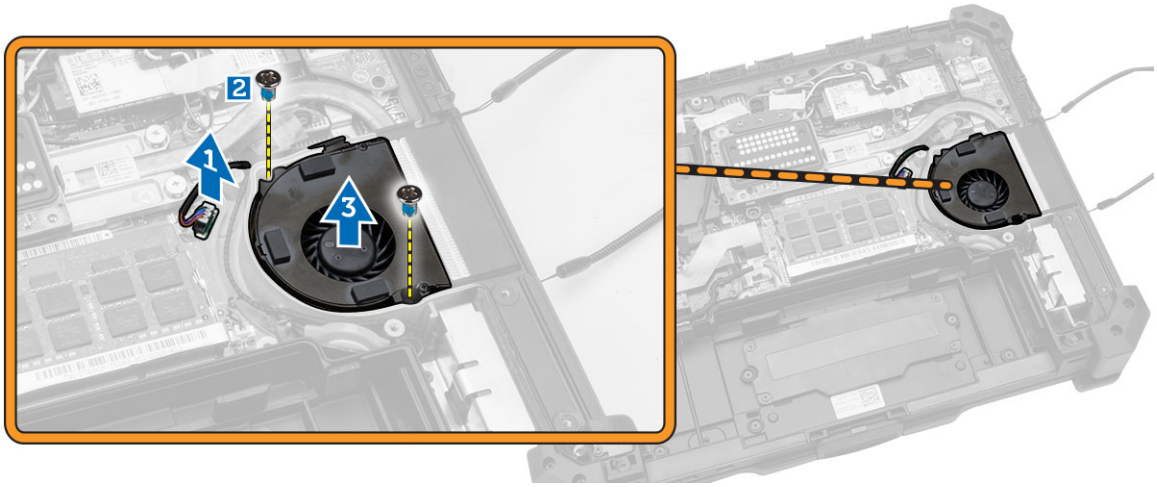


Installing the Hard Drive

1. Slide the hard drive into its place 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. bottom 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].

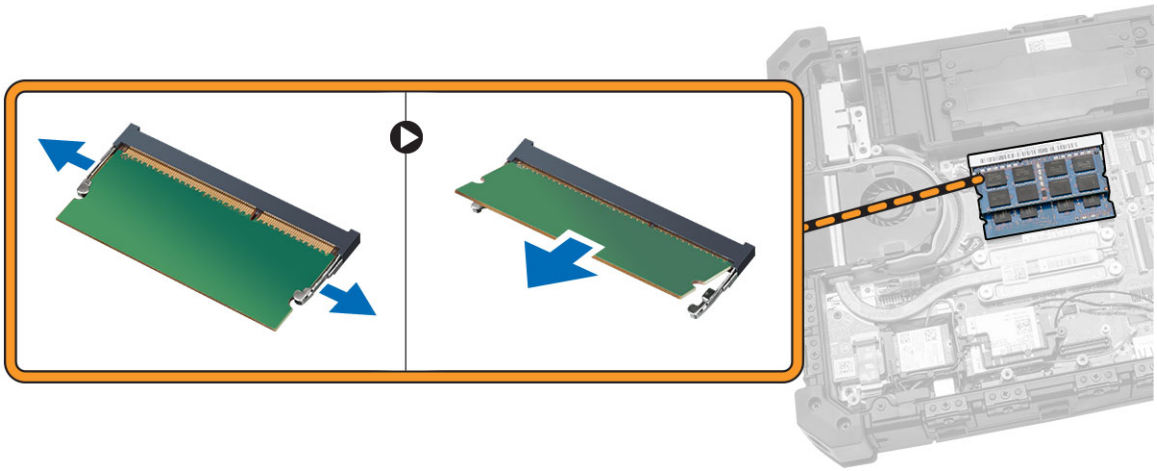


Installing the System Fan

1. Align the system fan in its position on the computer chassis.
2. Tighten the screws to secure the system fan to the computer chassis.
3. Connect the system fan connector cable to the system board connector.
4. Install:
   a. battery
   b. bottom cover
5. 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. bottom cover
3. To remove the memory module:
   a. Pry the securing clips away from the memory module until it pops up.
   b. Remove the memory module from its connector on the system board.



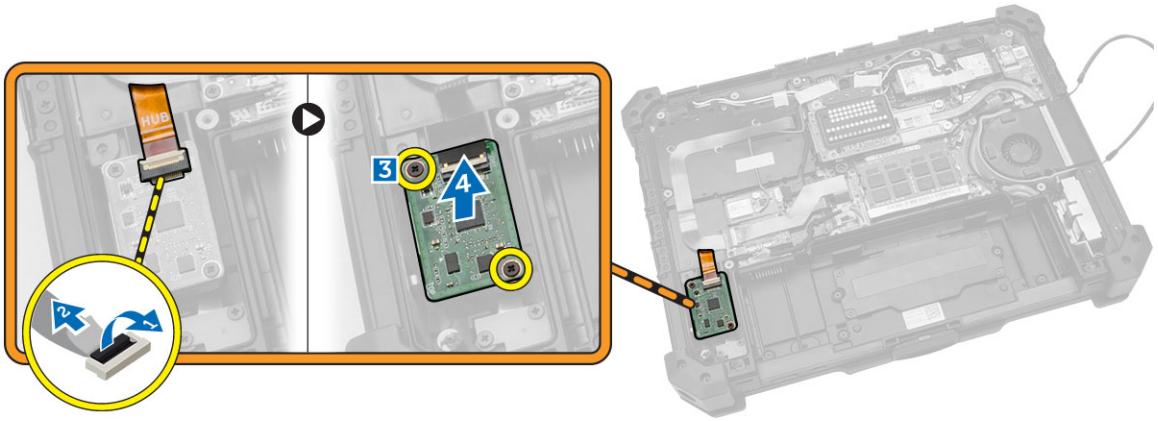
Installing the Memory Module

1. Insert the memory module into the memory socket.
2. Press the memory module down until it clicks into place.
3. Install:
   a. bottom cover
   b. battery
4. Follow the procedures in After Working Inside Your computer.

Removing the MEMS Board

MEMS board is also known as the sensor board.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom 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].

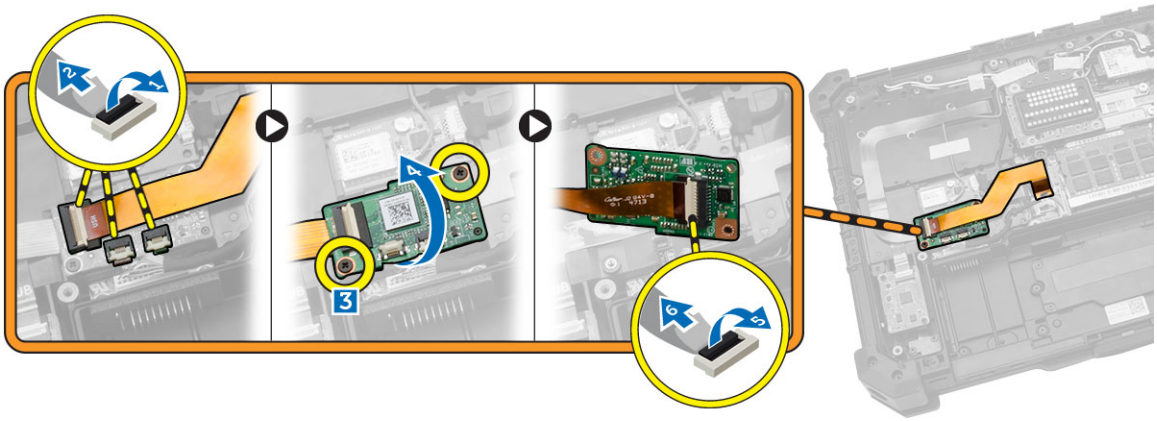


Installing the MEMS Board

1. Place the MEMS board in the slot.
2. Tighten the screws to secure the MEMS board.
3. Connect the cable to the MEMS board.
4. Install:
   a. bottom 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. bottom cover
3. To remove the USH board:
   a. Disconnect the USH board cables from the connectors [1,2].
   b. Remove the screws that secure the board [3].
   c. Lift and flip the board at an angle to access the smart card cable at the bottom [4].
   d. Disconnect the smart card cable and release the USH board from the computer chassis [5,6].
   e. Remove the USH board from the computer.



Installing the USH Board

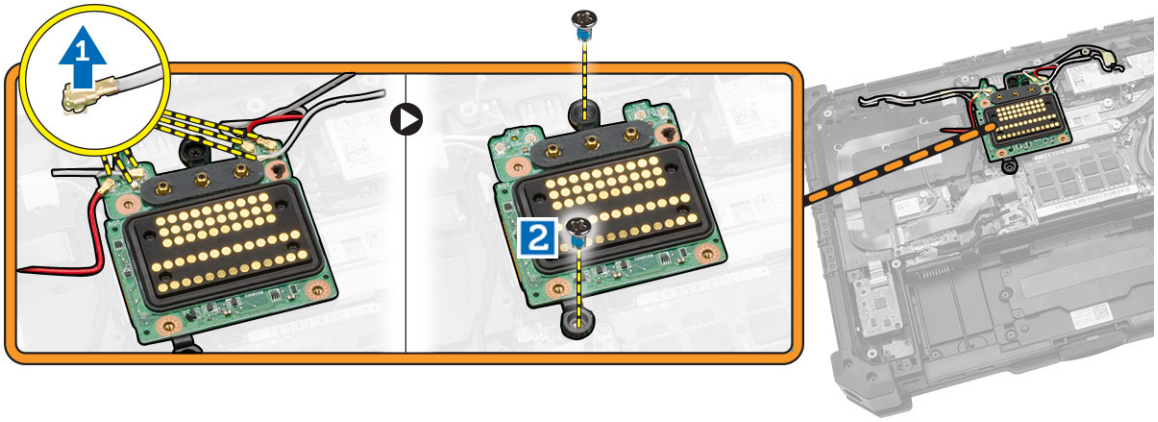
1. Connect the smart card cable to the USH board at the bottom of the board.
2. Flip the USH board to replace it to its original position.
3. Tighten the screws to secure the USH board.
4. Connect the cables to the USH board.
5. Install:
   a. bottom cover
   b. battery
6. Follow the procedures in After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

Removing the Docking Board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom cover
3. To release the docking board:
   a. Disconnect the antenna cables from the docking board [1].

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

   b. Remove the screws that secure the docking board [2].



4. To remove the docking board:
   a. Flip the board [1].
   b. Disconnect the docking board connector cable from the system board by lifting the cable-release tab [2].
   c. Lift and remove the docking board from the computer chassis [3].

Installing the Docking Board

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

Removing the Heatsink

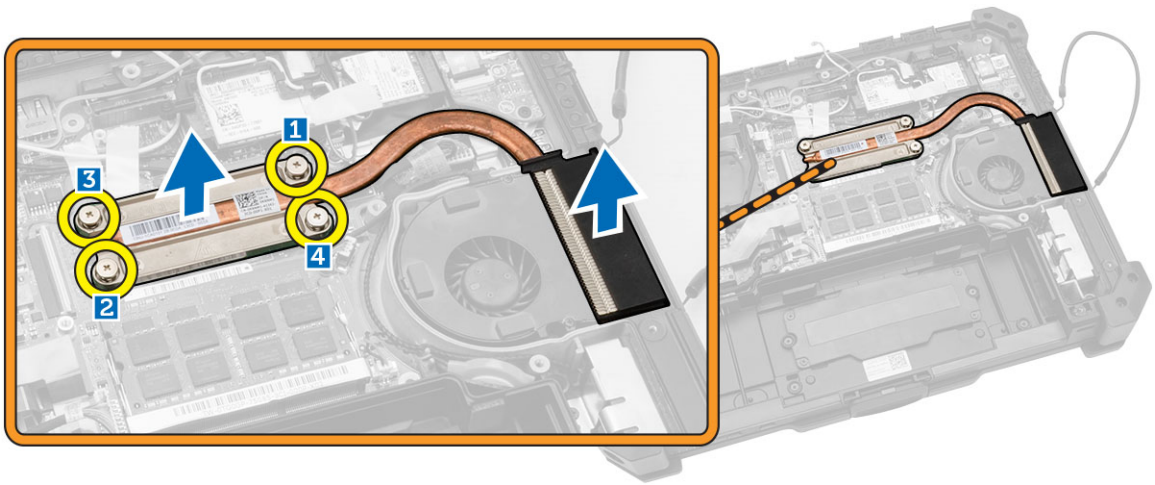
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:

a. battery
b. bottom cover

3. 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 from the computer chassis.

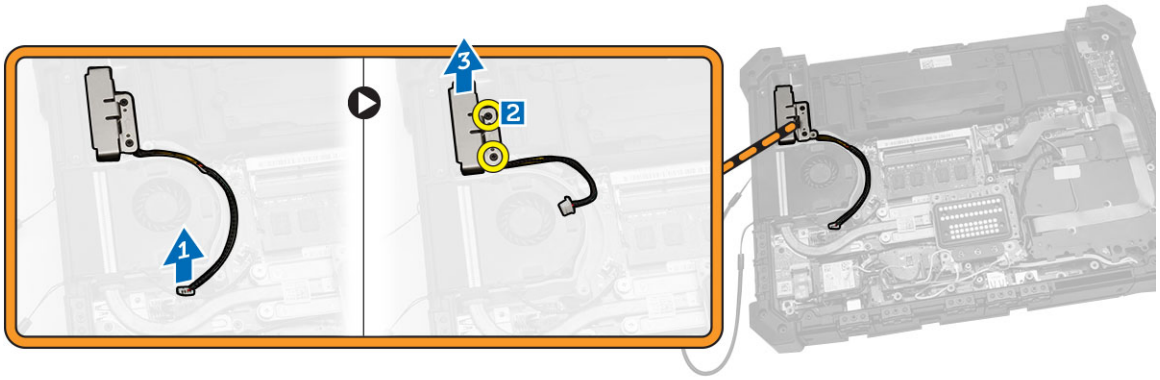


Installing the Heatsink

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. Install:
   a. heatsink
   b. battery
5. 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. bottom cover
3. To remove the speaker:
   a. Disconnect the speaker cable from the system board [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 to secure the speaker.
3. Connect the speaker cable to the system board.
4. Install:
   a. bottom cover
   b. battery
5. Follow the procedures in After Working Inside Your Computer.

Removing the SIM Board Assembly

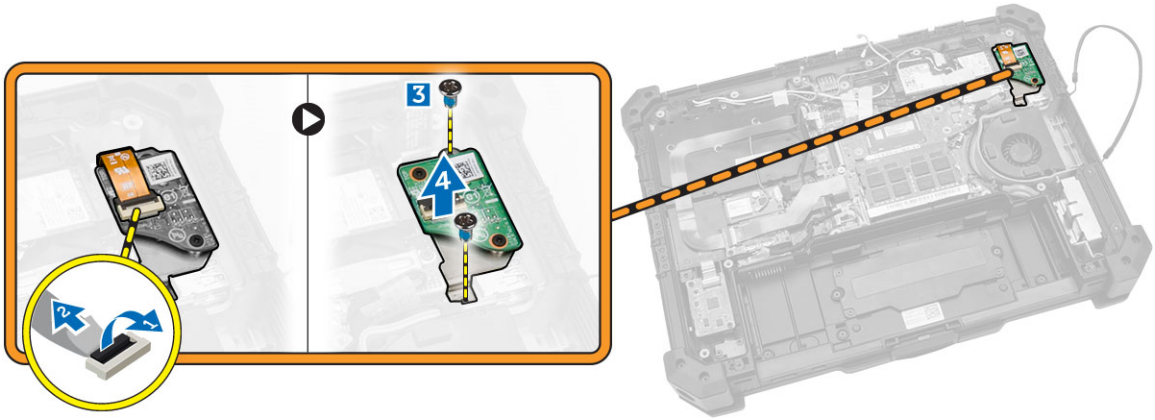
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom cover
3. To remove the SIM board assembly:

   NOTE: SIM board assembly comprises of the SIM board and the SIM bracket.

   a. Disconnect the cable from the SIM board [1,2].

      NOTE: You can also disconnect the SIM board cable from the system board but it is not a requirement.

   b. Remove the screws that secure the SIM board assembly [3].
   c. Lift the SIM board assembly from the computer chassis [4].



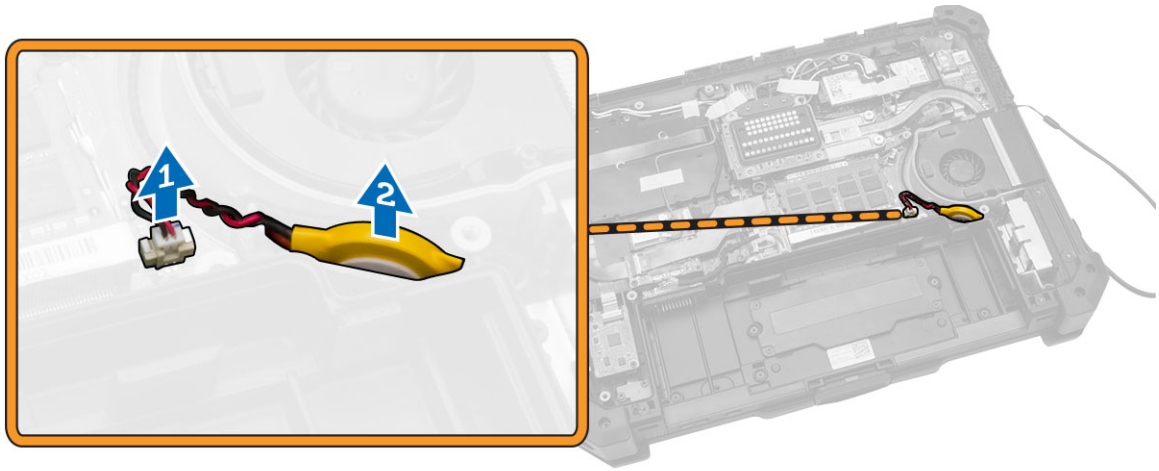
NOTE: To remove the SIM board from the assembly, remove the screws that secure the SIM board to the SIM bracket.

Installing the SIM Board Assembly

1. Place the SIM board on the bracket and tighten the screws.
2. Place the SIM board assembly in the slot on the computer chassis.
3. Tighten the screws to secure the SIM board.
4. Connect the cable to the SIM board connector.
5. Connect the cable to the system board, if you had disconnected the SIM board cable from the system board.
6. Install:
   a. bottom cover
   b. battery
7. 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. bottom 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].

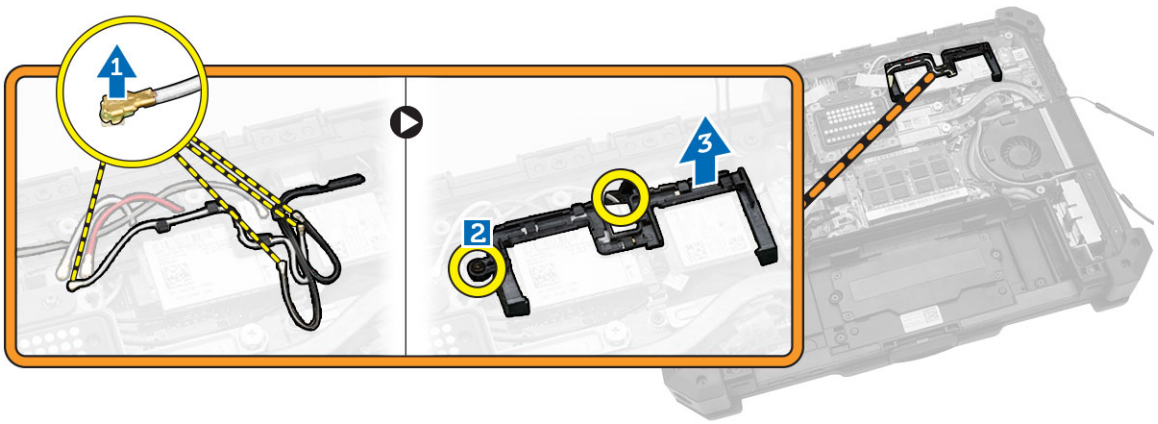


Installing the Coin-Cell Battery

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. bottom cover
   b. battery
4. 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. bottom cover
3. Remove the tapes that secure the wireless antenna cables.
4. 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.
   c. Remove the screws that secure the bracket [2].
   d. Lift and remove the antenna routing bracket from the computer chassis [3].

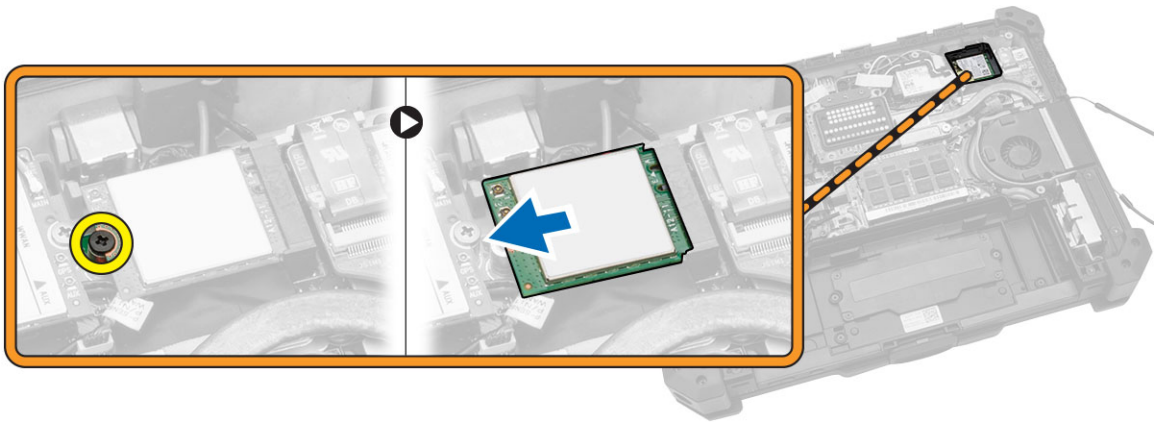


Installing the Antenna Routing Bracket

1. Place the antenna routing bracket in the slot on the computer chassis.
2. Tighten the screws to secure the cable holder.
3. Route the antenna cables into the routing channels.
4. Connect all the wireless antenna cables to the connectors.
5. Secure the tapes to secure the wireless antenna cables.
6. Install:
   a. bottom 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. bottom 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.
   b. Slide and lift the WLAN card from the slot.

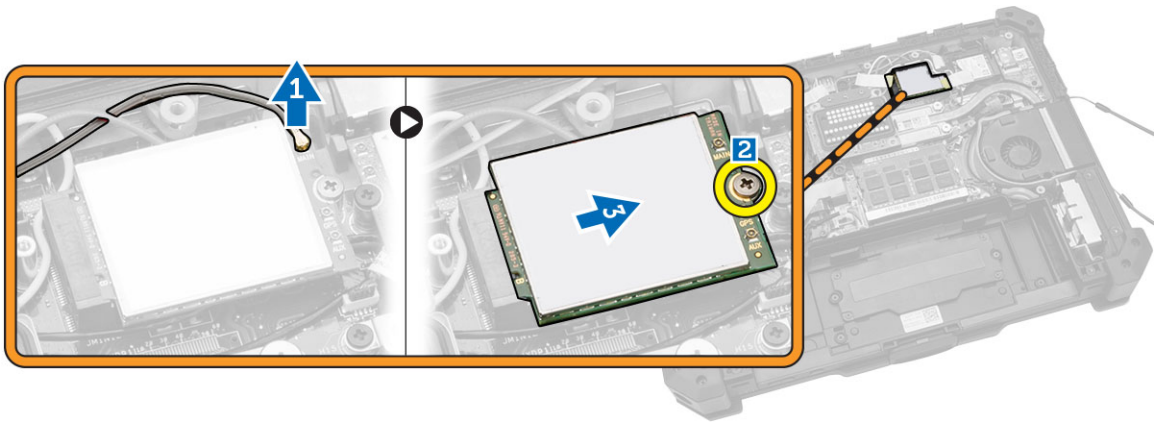


Installing the WLAN Card

1. Insert the WLAN card in the slot.
2. Connect the screw to secure the cable holder.
3. Connect the antenna cables to the WLAN card.
4. Install:
   a. antenna routing bracket
   b. bottom 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. bottom cover
   c. antenna routing bracket
3. To remove the WWAN card:
   a. Disconnect the antenna cable from the WWAN card [1].
   b. Remove the screw that secures the WWAN card [2].
   c. Slide the card out of the card connector on the system board and remove it [3].

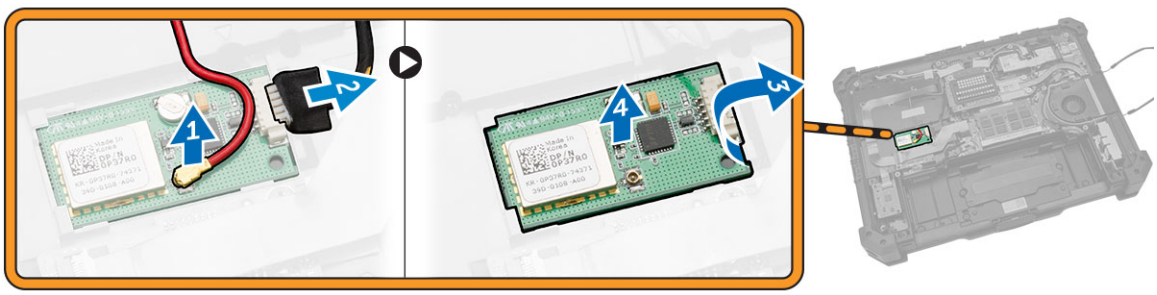


Installing the WWAN Card

1. Slide the WWAN card into its connector on the system board.
2. Press the card down and tighten the screw to secure the WWAN card.
3. Connect the antenna cables as per the color code, on the WWAN card.
4. Install:
   a. antenna routing bracket
   b. bottom cover
   c. battery
5. 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. bottom cover
3. To remove the GPS module:
   a. Disconnect the GPS antenna cable from the module [1].
   b. Disconnect the USB cable from the GPS module [2].
   c. Pry the retention latch to release the GPS module [3].
   d. Lift the GPS module from the computer chassis [4].

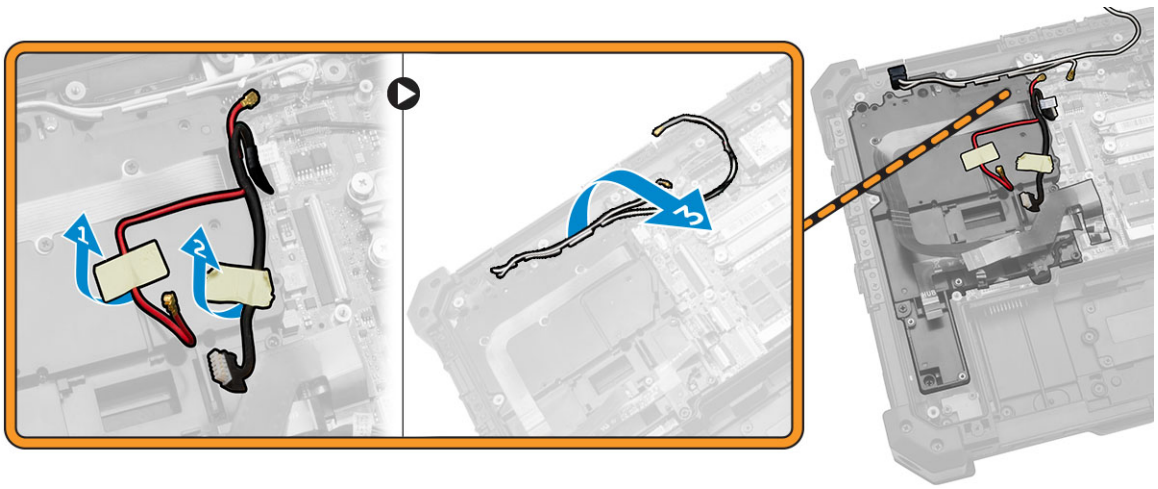


Installing the Global Positioning System (GPS) Module

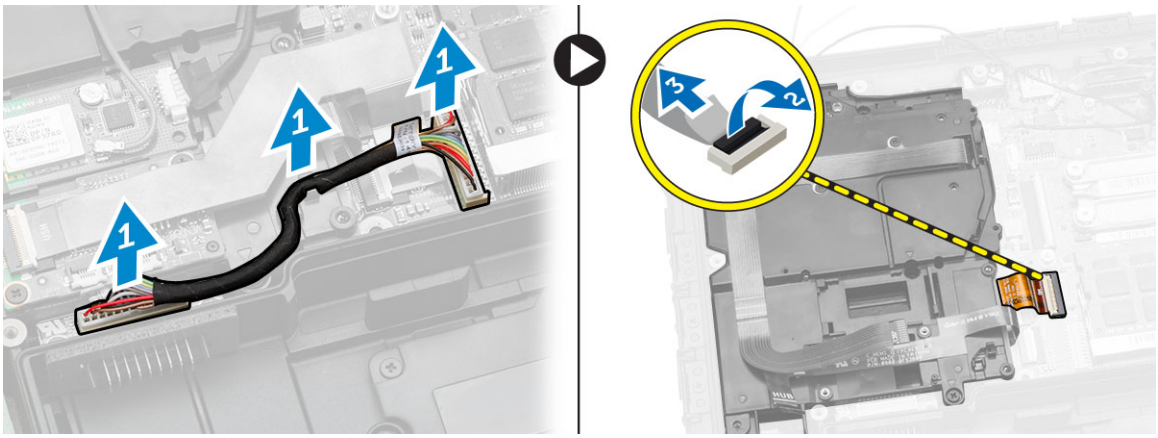
1. Insert the GPS module into its slot and press down the latch to secure it.
2. Connect the cable to the connector on the GPS module.
3. Connect the antenna cable to the GPS module
4. Install:
   a. bottom cover
   b. battery
5. Follow the procedures in After Working Inside Your Computer.

Removing the Card Bracket

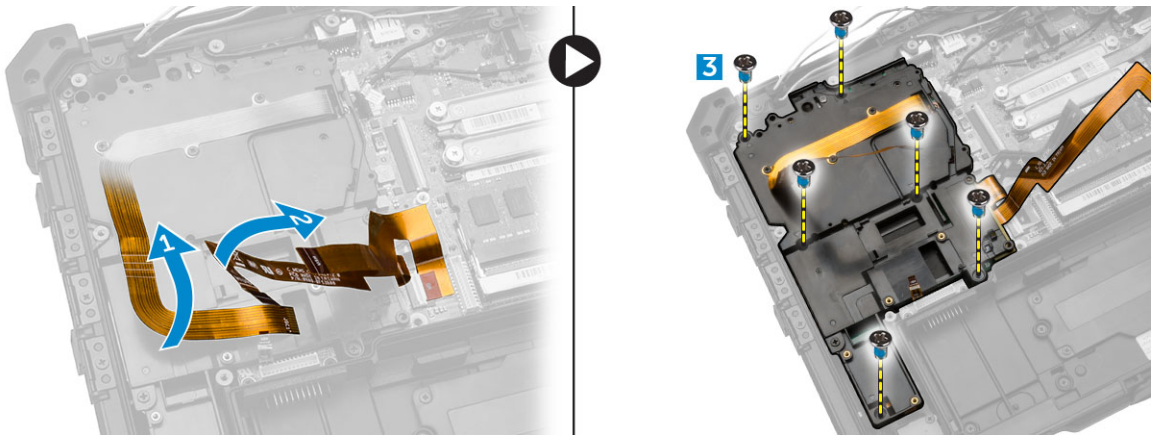
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
3. Unroute the antenna cables by removing the tapes.



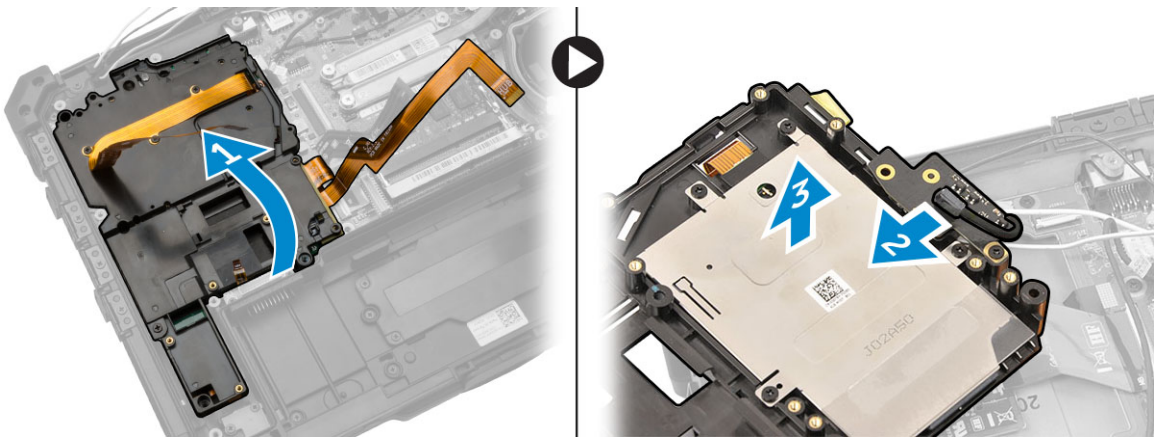
4. To disconnect the cables:
   a. Disconnect the battery cable from the system board and the battery board [1].
   b. Disconnect the MEMS cable from the system board [2,3].



5. To unroute the cables:
   a. Unroute the GPS and the C-storage cables.
   b. Remove the screws that secure the card bracket to the computer chassis.



6. To remove the card bracket:
   a. Flip the card bracket [1].
   b. Disconnect the camera cable from the connector [2].
   c. Lift up and remove the card bracket [3].

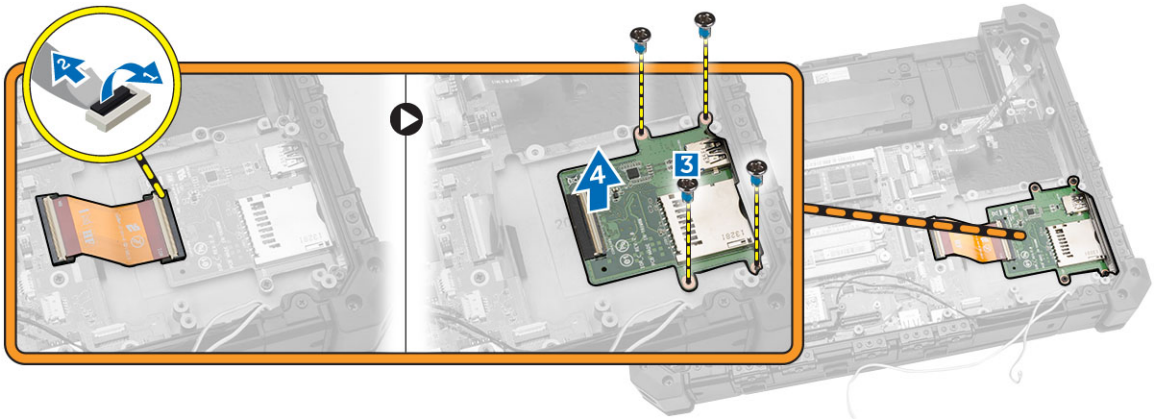


Installing the Card Bracket

1. Place the card bracket in the slot on the computer chassis.
2. Connect the camera cable to the connector on the card bracket.
3. Flip the card bracket and seat the card on the slot.
4. Tighten the screws to secure the card bracket.
5. Route the GPS and the C-storage cable through the routing channels.
6. Connect the MEMS cables to the system board.
7. Connect the battery cable to the battery board connector and the system board.
8. Install:
   a. hard drive
   b. MEMS board
   c. USH board
   d. GPS module
   e. hard drive
   f. bottom cover
   g. battery
9. Follow the procedures in After Working Inside Your Computer.

Removing the I/O Board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. Disconnect the battery cable from the battery board.
   i. card bracket
3. To remove the I/O board:
   a. Disconnect the cable from the I/O board [1,2].
   b. Remove the screws that secure the I/O board [3].
   c. Lift the I/O board from the slot [4].

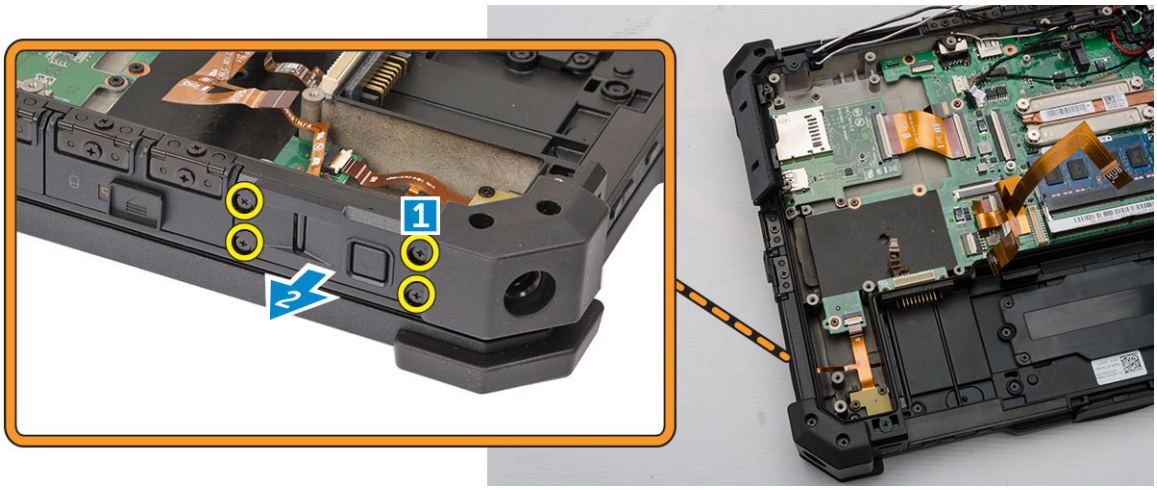


Installing the I/O Board

1. Insert the I/O board in its slot.
2. Tighten the screws to secure the I/O board.
3. Connect the I/O board cable to the I/O board.
4. Install:
   a. card bracket
   b. Connect the battery cable to the battery board.
   c. hard drive
   d. MEMS board
   e. USH board
   f. GPS module
   g. docking board
   h. bottom cover
   i. battery
5. Follow the procedures in After Working Inside Your Computer.

Removing the Fingerprint Reader

1. Follow the procedures in Before Working Inside Your Computer
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. card bracket
3. To remove the fingerprint reader:
   a. Remove the screws that secure the fingerprint reader [1]
   b. Remove the fingerprint reader from the computer chassis [2].



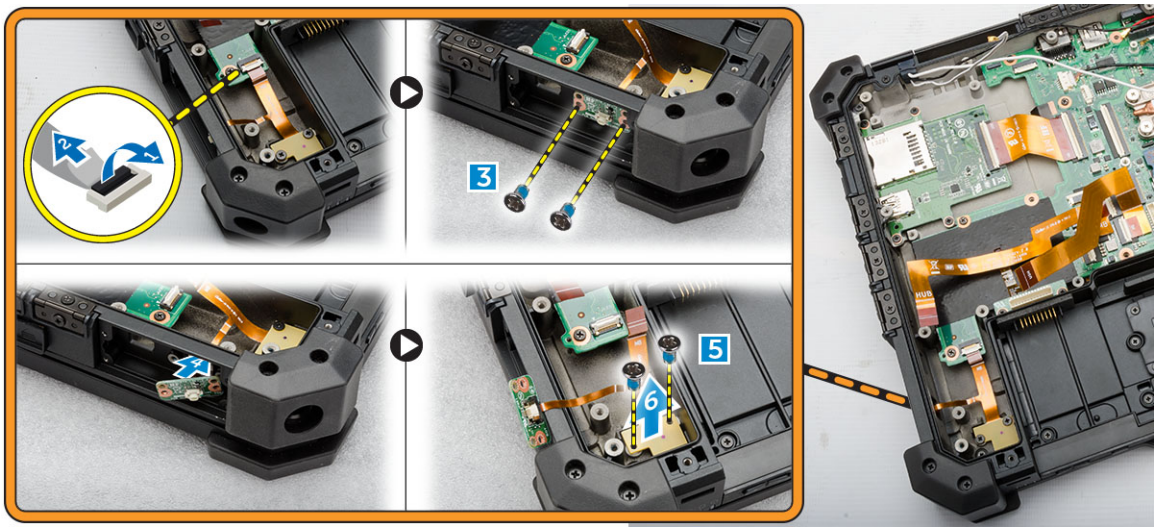
Installing the Fingerprint Reader

1. Place the fingerprint reader in the slot on the computer chassis.
2. Tighten the screws to secure the fingerprint reader.
3. Install:
   a. card bracket
   b. hard drive
   c. MEMS board
   d. USH board
   e. GPS module
   f. docking board
   g. bottom cover
   h. battery
4. Follow the procedures in After Working Inside Your computer.

Removing the LED Board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. card bracket
   i. fingerprint reader
3. To remove the LED board:
   a. Disconnect the LED board from the connector [1,2]
   b. Remove the screws from the side of the computer chassis [3].
   c. Release the LED board [4].

d. Remove the screws that secure the LED board [5].
e. Lift the LED board from the computer chassis [6].



Installing the LED Board

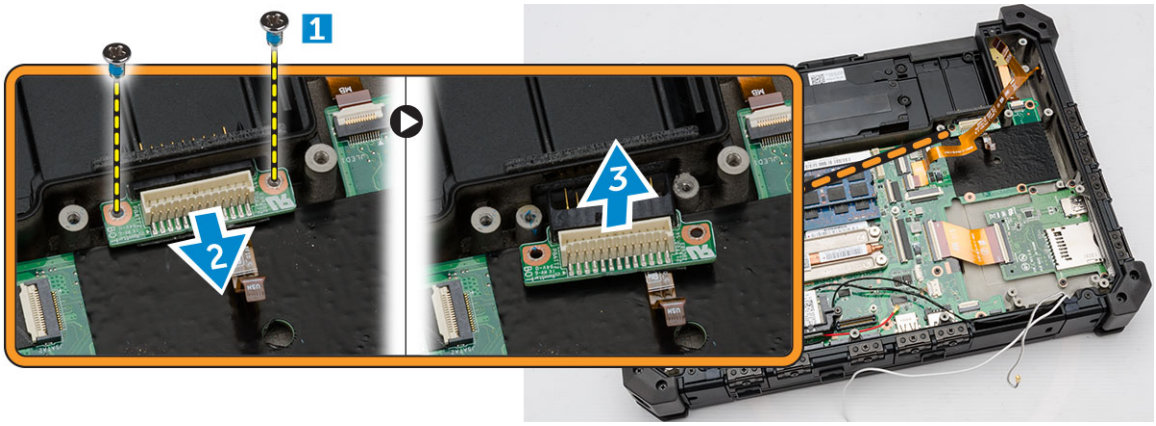
1. Insert the LED board in the slot on the computer chassis.
2. Connect the screws to secure the LED board.
3. Push the LED board to secure it.
4. Connect the screws to secure the board.
5. Connect the LED board to the connector.
6. Install:
   a. fingerprint reader
   b. card bracket
   c. hard drive
   d. MEMS board
   e. USH board
   f. GPS module
   g. docking board
   h. bottom cover
   i. battery
7. Follow the procedures in After Working Inside Your computer.

Removing the Battery Board

1. Follow the procedures in Before Working Inside Your Computer
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board

f. MEMS board
g. hard drive
h. card bracket

3. Disconnect the battery cable from the battery board.
4. To remove the battery board:
   a. Remove the screws that secure the battery board [1]
   b. Disconnect the battery board from the connector [2].
   c. Lift the battery board away from the computer [3].



Installing the Battery Board

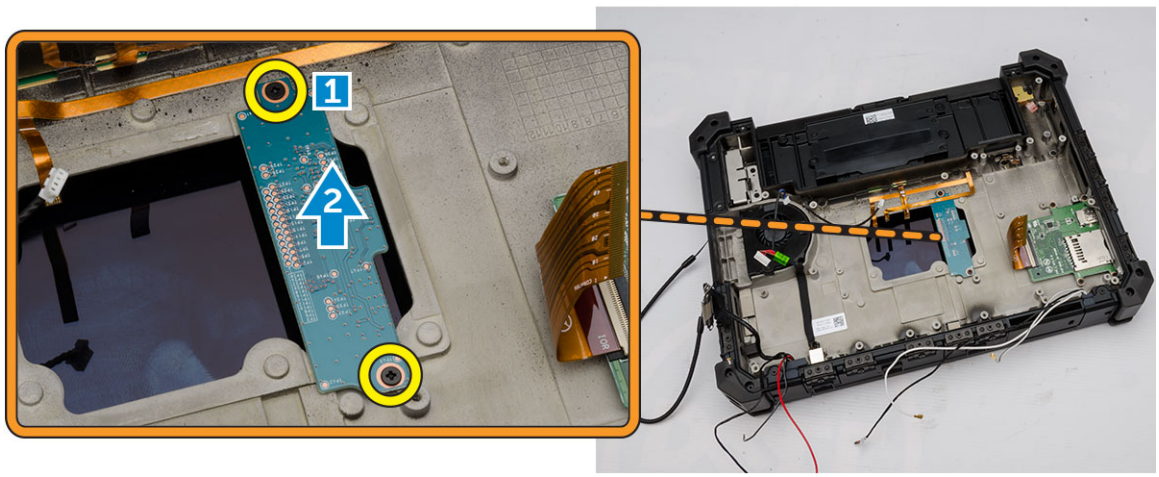
1. Slide the battery board to its connector.
2. Tighten the screws to secure the battery board.
3. Connect the battery cable to the battery board.
4. Install:
   a. card bracket
   b. hard drive
   c. MEMS board
   d. USH board
   e. GPS module
   f. docking board
   g. bottom cover
   h. battery
5. Follow the procedures in After Working Inside Your computer.

Removing the Keyboard Control Board

1. Follow the procedures in Before Working Inside Your Computer
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board

f. MEMS board
g. hard drive
h. Disconnect the battery cable from the battery board.
i. system fan
j. card bracket
k. memory module
l. antenna routing bracket
m. WLAN
n. WWAN
o. heatsink
p. battery board
q. SIM board
r. system board

3. To remove the keyboard control board:
   a. Remove the screws that secure the keyboard control board [1].
   b. Lift the keyboard control board from the computer chassis [2].



Installing the Keyboard Control Board

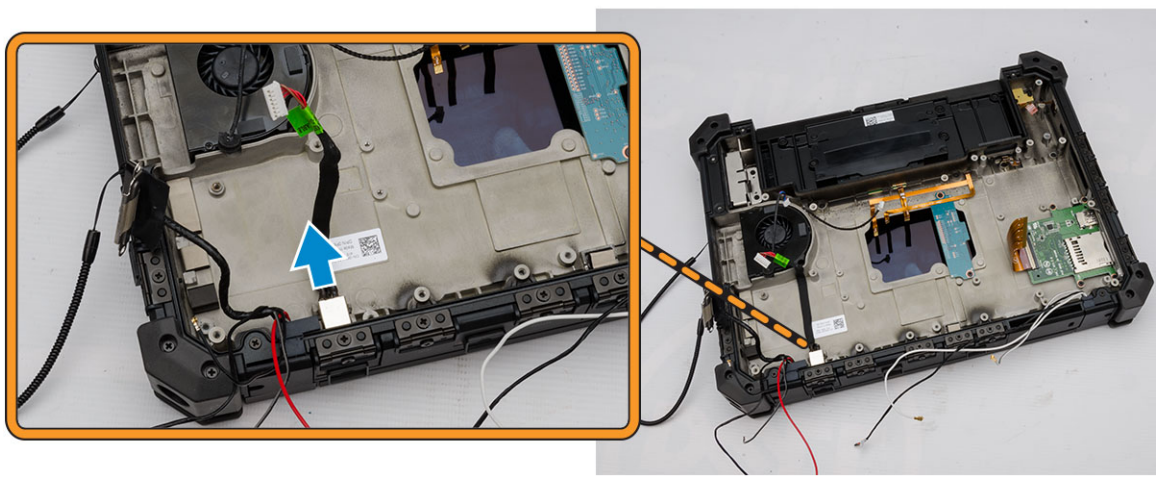
1. Place the keyboard control board in the slot on the computer chassis.
2. Tighten the screws to secure the keyboard control board.
3. Install:
   a. system board
   b. SIM board
   c. battery board
   d. heatsink
   e. WWAN
   f. WLAN
   g. antenna routing bracket
   h. memory
   i. card bracket
   j. system fan
   k. Connect the battery cable to the battery board.

l. hard drive
m. MEMS board
n. USH board
o. GPS module
p. docking board
q. bottom cover
r. battery

4. Follow the procedures 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. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. Disconnect the battery cable from the battery board.
   i. system fan
   j. card bracket
   k. memory module
   l. antenna routing bracket
   m. WLAN
   n. WWAN
   o. heatsink
   p. battery board
   q. SIM board
   r. system board
3. Pull the power connector from slot to release the power connector from the computer chassis.



Installing the Power Connector

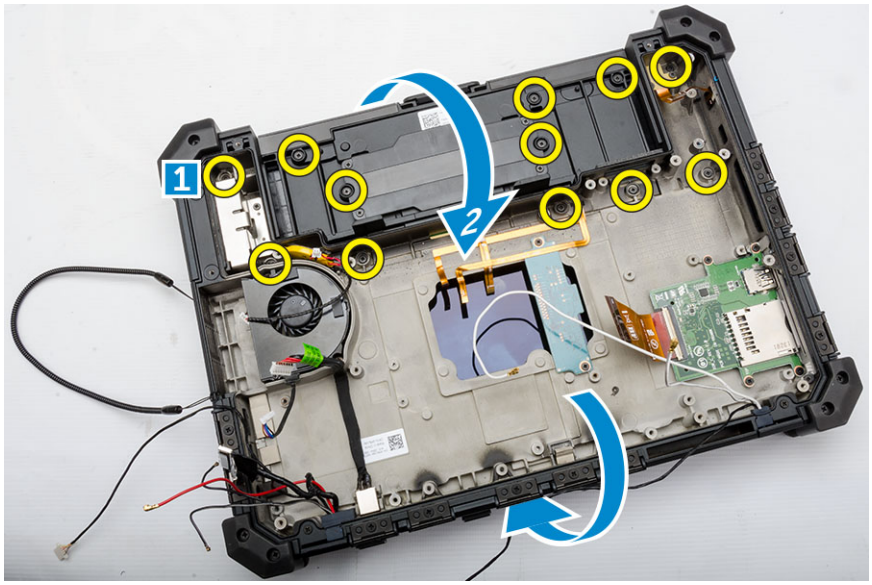
1. Insert the power connector by aligning it with the connector side with the base of the computer chassis.
2. Press to firmly secure the power connector to the computer chassis.
3. Install:
   a. system board
   b. SIM board
   c. battery board
   d. heatsink
   e. WWAN
   f. WLAN
   g. antenna routing bracket
   h. memory
   i. card bracket
   j. system fan
   k. Connect the battery cable to the battery board.
   l. hard drive
   m. MEMS board
   n. USH board
   o. GPS module
   p. docking board
   q. bottom cover
   r. battery
4. Follow the procedures in After Working Inside Your computer.

Removing the Palmrest

1. Follow the procedures in Before Working Inside Your Computer
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. Disconnect the battery cable from the battery board.
   i. system fan
   j. card bracket
   k. memory module
   l. antenna routing bracket
   m. WLAN
   n. WWAN
   o. heatsink
   p. battery board
   q. SIM board

r. system board

3. To release the palmrest:
   a. Remove the screws that secure the palmrest [1].
   b. Flip the computer chassis [2].



4. To remove the palmrest:
   a. Open the display [1].
   b. Pry the palmrest from the retention hooks [2].

Installing the Palmrest

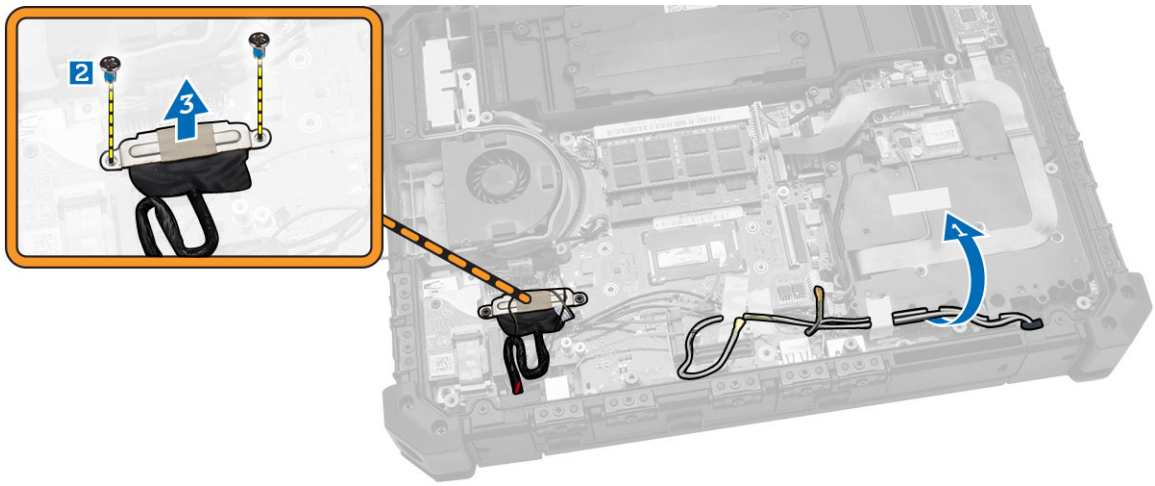
1. Align the palmrest and press it firmly.
2. Close the display and flip the computer chassis.
3. Tighten the screws to secure the palmrest to the computer chassis.
4. Install:
   a. system board
   b. SIM board
   c. battery board

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

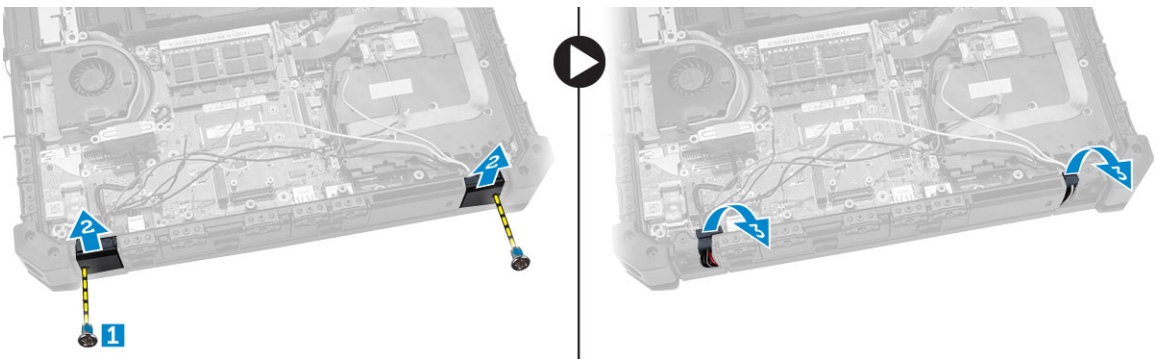
5. Follow the procedures in After Working Inside Your computer.

Removing the Display Assembly

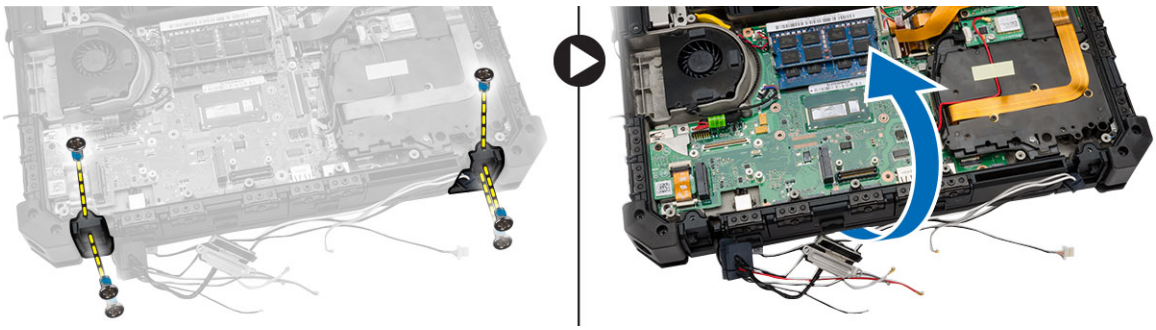
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
   a. battery
   b. bottom cover
   c. docking board
   d. GPS module
   e. USH board
   f. MEMS board
   g. hard drive
   h. Disconnect the battery cable to from the battery board.
   i. card bracket
   j. WLAN
   k. WWAN
   l. heatsink
3. To remove the eDP connector and unroute the display cables:
   a. Unroute the display cable from the system board [1].
   b. Remove the screws that secure the eDP connector [2].
   c. Lift up and remove the bracket from the connector [3].



4. To release the display assembly:
   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].



5. Remove the screws that secure the display hinges and flip the computer chassis.



6. Unlock the display and lift the display to remove it from the computer chassis.

Installing the Display Assembly

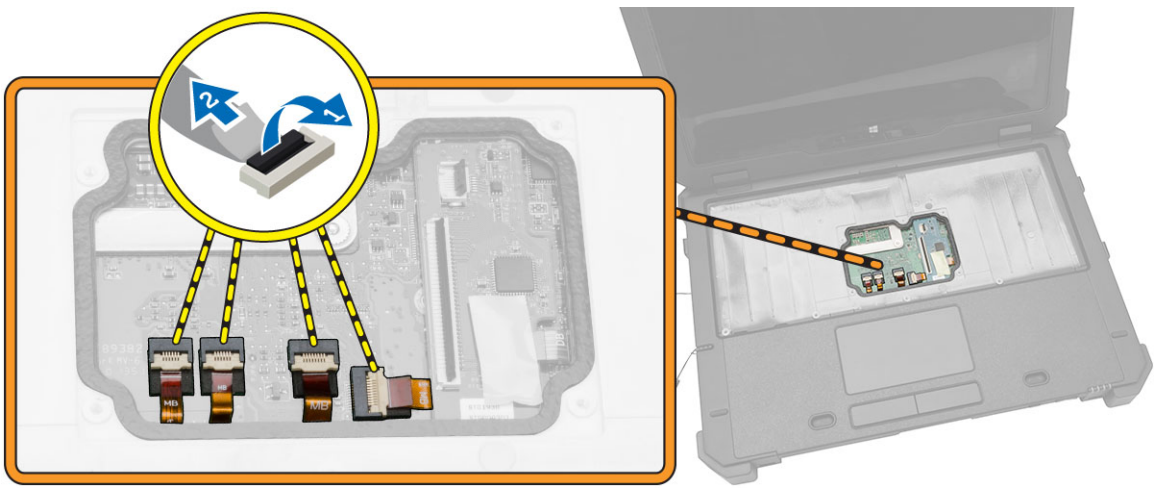
1. Install the display assembly and close the display.
2. Flip the computer chassis.
3. Install the display hinges in their slots.
4. Tighten the screws to secure the hinges.
5. Route the cables through the rubber gasket.
6. Install the hinge cover.
7. Tighten the screws to secure the hinge cover.
8. Install the eDP connector and place the bracket in its slot.
9. Tighten the screws to secure the eDP connector to the system board.
10. Route the cable through the routing channels.
11. Install:
    a. heatsink
    b. WWAN
    c. WLAN
    d. card bracket
    e. Connect the battery cable to battery board.
    f. hard drive
    g. MEMS board
    h. USH board
    i. GPS module
    j. docking board
    k. bottom cover
    l. battery
12. Follow the procedures in After Working Inside Your computer.

Removing the System Board

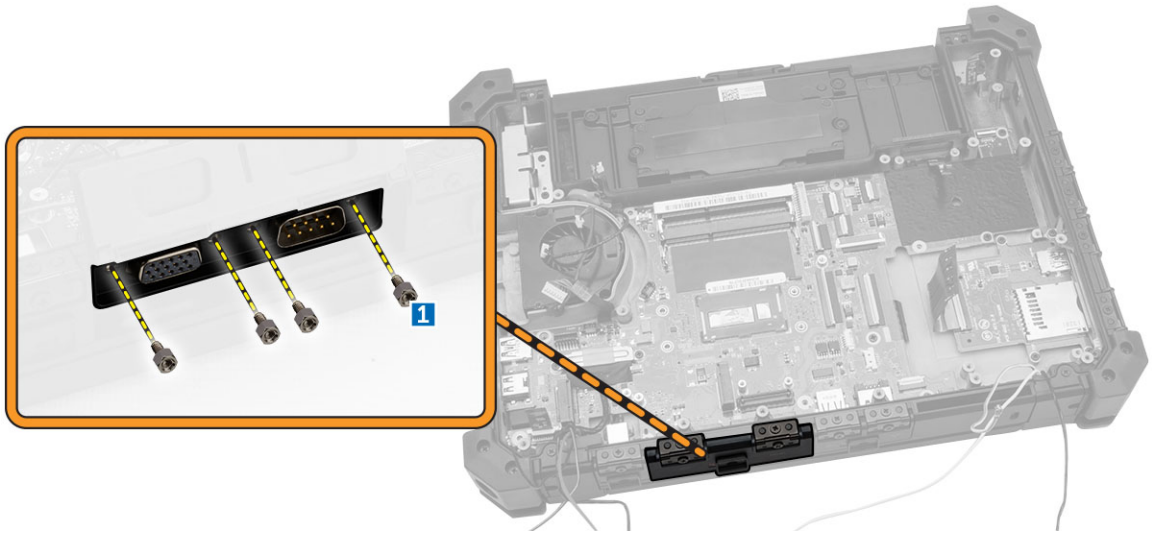
1. Follow the procedures in Before Working Inside Your Computer.
2. Remove:
    a. battery
    b. bottom cover
    c. docking board
    d. GPS module

e. GPS module
f. USH board
g. MEMS board
h. hard drive
i. system fan
j. card bracket
k. memory module
l. antenna routing bracket
m. WLAN
n. WWAN
o. heatsink
p. battery board
q. SIM board assembly
r. keyboard

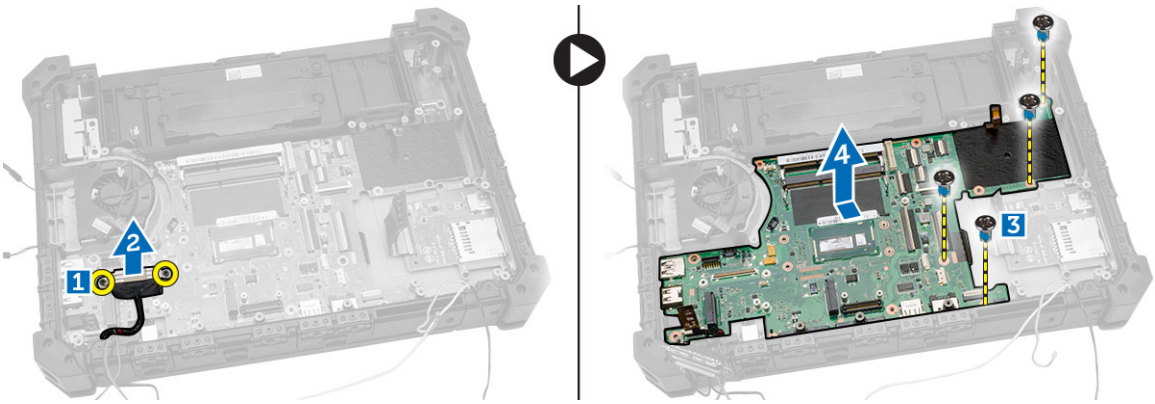
3. Disconnect the following cables from the system board:
   a. I/O board cable
   b. speaker cable
   c. coin-cell battery cable
4. Disconnect the ribbon cables from the system board [1,2].



5. To remove the video connectors:
   a. Open the connector latch door.
   b. Remove the screws that secure the video connectors [1].
   c. Remove the connectors away from the computer [1].



6. To remove the system board:
   a. Remove the screws that secure the eDP connector [1].
   b. Lift and remove the eDP connector bracket [2].
   c. Remove the screws that secure the system board [3].
   d. Slide and lift the system board from the computer chassis [4].



Installing the System Board

1. Place the system board to align with the connectors.
2. Tighten the screws to secure the system board to the computer chassis.
3. Install the eDP connector and place the bracket in its slot.
4. Tighten the screws to the secure the eDP connector to the system board.
5. Tighten the screws to secure the video connector.
6. Close the video connector latch door.
7. Flip the computer chassis and connect the ribbon cables to the system board.
8. Connect the following cables to the system board:
   a. I/O board cable
   b. speaker cable

c. coin-cell battery cable

9. Install:
   a. keyboard
   b. SIM board assembly
   c. battery board
   d. heatsink
   e. WWAN
   f. WLAN
   g. antenna routing bracket
   h. memory module
   i. card bracket
   j. system fan
   k. hard drive
   l. MEMS board
   m. USH board
   n. GPS module
   o. dock board
   p. bottom cover
   q. battery
10. Follow the procedures in After Working Inside Your computer.

3

System Setup

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

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

Boot Sequence

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

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

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

- Removable Drive (if available)
- STXXXX Drive

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

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

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

Navigation Keys

The following table displays the system setup navigation keys.

NOTE: For most of the system setup options, changes that you make are recorded but do not take effect until you re-start the system.

Table 1. Navigation Keys

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

System Setup Options

NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.

Table 2. General

Option	Description
System Information	This section lists the primary hardware features of your computer. • System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code. • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM ASize, DIMM B Size, • Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit Technology. • Device Information: Displays Primary Hard Drive, MiniCard Device, ODD Device, Dock eSATA Device, LOM MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, WiGig Device, Cellular Device, Bluetooth Device.
Battery Information	Displays the battery status and the type of AC adapter connected to the computer
Boot Sequence	Boot Sequence Allows you to change the order in which the computer attempts to find an operating system. The options are: • Diskette Drive • Internal HDD • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC

Option	Description	
		By default, all the options are checked. You can also deselect any option or change the boot order.
	Boot List Option	Allows you to change the boot list option. • Legacy • UEFI
Advanced Boot Options	This option allows you the legacy option ROMs to load. By default, the **Enable Legacy Option ROMs** is checked.	
Date/Time	Allows you to change the date and time.	

Table 3. System Configuration

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. The options are: • Disabled • Enabled • Enabled w/PXE: This option is enabled by default.
Unmanaged NIC	This option controls the on-board USB LAN controller. This option is enabled by default.
Parallel Port	Allows you to configure the parallel port on the docking station. The options are: • Disabled • AT: This option is enabled by default. • PS2 • ECP
Serial Port 1	Allows you to configure the integrated serial port. The options are: • Disabled • COM1: This option is enabled by default. • COM3
Serial Port 2	Allows you to configure the integrated serial port. The options are: • Disabled • COM2: This option is enabled by default. • COM4
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • AHCI • RAID On: This option is enabled by default.

Option	Description
Drives	Allows you to configure the SATA drives on board. All drives are enabled by default. The options are: • SATA-0 • SATA-1 • SATA-2 • SATA-3
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. • Enable SMART Reporting
USB Configuration	This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (HDD, memory key, floppy). If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. • Enable USB Boot Support • Enable External USB Ports • Enable USB3.0 Controller • Disable Docking Station Devices except video NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.
USB PowerShare	This option configures the USB PowerShare feature behavior. This option is unchecked by default.
Audio	This field enables or disables the integrated audio controller. By default, the **Enable Audio** option is selected.
Keyboard Illumination	This field lets you choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 25% to 100% • Disabled. • Level is 25% • Level is 50% • Level is 75% • Level is 100%: This option is enabled by default
RGB Keyboard Backlight	This option configures the RGB keyboard backlight feature. There are six available colors: four preset colors (white, red, green, and blue) and two user configurable colors.

Option	Description
Touchscreen	This field controls whether the touchscreen is enabled or disabled. This option is enabled by default.
Stealth Mode Control	This field is used to enable or disable the stealth mode. This option is enabled by default.
Miscellaneous Devices	Allows you to enable or disable the following devices: • Enable Microphone • Enable Front Camera • Enable Express card • Enable Hard Drive Free Fall Protection • Enable Back Camera • Enable Dedicated GPS NOTE: All devices are enabled by default. You can also enable or disable Media Card.
Keyboard Backlight Always on with AC Power	This option keeps the keyboard backlight powered on when connected to AC power.

Table 4. Video

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 only be visible when a video card is installed into the system.

Table 5. Security

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: Successful password changes take effect immediately. Default Setting: Not set
System Password	Allows you to set, change or delete the system password. NOTE: Successful password changes take effect immediately. Default Setting: Not set
Internal HDD-1 Password	Allows you to set or change the system's internal hard-disk drive. NOTE: Successful password changes take effect immediately.

Option	Description
	Default Setting: Not set
Strong Password	Allows you to enforce the option to always set strong passwords. Default Setting: Enable Strong Password is not selected. NOTE: If Strong Password is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.
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 HDD password, when they are set. The options are: • Disabled • Reboot bypass Default Setting: Disabled
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default Setting: Allow Non-Admin Password Changes is selected
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password.
TPM Security	Allows you to enable the Trusted Platform Module (TPM) during POST. Default Setting: The option is disabled.
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 Deactivate (default)
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: • Enable • One Time Enable • Disable

Option	Description
	Default Setting: Enable
Admin Setup Lockout	Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: Enable Admin Setup Lockout is not selected.

Table 6. Secure Boot

Option	Description
Secure Boot Enable	This option enables or disables the Secure Boot Feature. • Disable (default) • Enable
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 Key**s- 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.

Table 7. Performance

Option	Description
Multi Core Support	This field specifies whether the process will have one or all cores enabled. The performance of some applications will improve with the additional cores. This option is enabled by default.Allows you to enable or disable multi-core support for the processor. The options are: • All • 1 • 2

Option	Description
	Default Setting: All
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep feature. Default Setting: Enable Intel SpeedStep
C States Control	Allows you to enable or disable the additional processor sleep states. Default Setting: The option C states is enabled.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. Default Setting: Enable Intel TurboBoost
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. Default Setting: Enabled
Rapid Start Technology	This option might improve the battery life by automatically putting the computer in to a low power state during Sleep, after a user-specified amount of time. Default Setting: Disabled

Table 8. Power Management

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Default Setting: Wake on AC is not selected.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled **(default)** • Every Day • Weekdays • Select Days
USB Wake Support	Allows you to 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 will remove power from all of the USB ports to conserve battery power. • Enable USB Wake Support • DEnable USB Wake Support is not selected
Wireless Radio Control	Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection.

Option	Description
	• Control WLAN Radio • Control WWAN Radio • Control WLAN radio or Control WWAN radio is not selected (default)
Wake on LAN/WLAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled: This option is enabled by default • LAN Only • WLAN Only • LAN or WLAN • LAN with PXE Boot
Block Sleep	This option lets you block entering to sleep (S3 state) in Operating System environment. Block Sleep (S3 state) - This option is disabled by default.
Peak Shift	This option enables you to 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.
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours to improve the battery health. Disabled (default)
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • Adaptive • Standard • ExpressCharge: This option is enabled by default. • 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.
Battery Slice Charge Configuration	Allows you to select the type of charge for the battery. The options are: • Standard Charge • Express Charge : This option is enabled by default. NOTE: Express charge may not be available for all the batteries. To enable this option, disable the **Advanced Battery Charge Configuration** option.

Option	Description
Intel Smart Connect Technology	This option, if enabled, periodically senses the nearby wireless connections, while the system is in sleep state. You can use this option to synchronize the email or other social media application that are open, when the system enters the sleep state.

Table 9. POST Behavior

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: The Keyboard (Embedded) option is not supported in Latitude E5540
Mouse/Touchpad	Allows you to define how the system handles mouse and touch pad input. The options are: • Serial Mouse • PS2 Mouse • Toushpad/PS-2 Mouse: This option is enabled by default.
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Enable Network (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)
Mebx Hotkey	Allows you to specify whether the MEBx Hotkey function should be enabled when the system boots Enable MEBx Hotkey (default)
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 pre-boot delay. The options are : 0 seconds, 5 seconds (default), and 10 seconds.

Table 10. Virtualization Support

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.

Table 11. Wireless

Option	Description
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: • WWAN • WLAN • WiGig • Bluetooth All the options are enabled by default.
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. • WWAN • WLAN/WiGig • Bluetooth All options are enabled by default.

Table 12. Maintenance

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.

Table 13. System Logs

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. Re-start 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.

System and Setup Password

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

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

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

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

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

Assigning a System Password and Setup Password

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

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

To enter a 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 the System Setup.
   The computer reboots.

4

Diagnostics

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

Enhanced Pre-Boot System Assessment (ePSA) Diagnostics

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

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

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

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

1. Power-on the computer.
2. As the computer boots, press the <F12> key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.

   The **Enhanced Pre-boot System Assessment** window is displayed, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.
4. If you wish to run a diagnostic test on a specific device, press <Esc> and click **Yes** to stop the diagnostic test.
5. Select the device from the left pane and click **Run Tests**.
6. If there are any issues, error codes are displayed.

   Note the error code and contact Dell.

Device Status Lights

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.
	Turns on when wireless networking is enabled.

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.

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Contacting Dell

NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Visit **dell.com/support**
2. Select your support category.
3. Verify your country or region in the Choose a Country/Region drop-down menu at the top of page.
4. Select the appropriate service or support link based on your need.