Dell Latitude XT3
Owner's Manual

Regulatory Model: P17G
Regulatory Type: P17G001

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

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

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

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

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

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

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

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

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

Recommended Tools

The procedures in this document may require the following tools:

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

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 4 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, battery slice, 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.

2

Tablet PC Features

Introduction

Your computer is a Tablet PC that has the following features:

- User Modes
- Tablet Buttons
- Tablet PC Interface
- Tablet Settings

User Modes

You can use your Tablet PC in two different modes:

- Notebook mode
- Tablet mode

Using Your Tablet PC in the Tablet Mode

You can convert your Tablet PC from notebook mode to tablet mode with a 180–degree clockwise and anti-clockwise twist of the display's rotating hinge.

CAUTION: Do not force the hinge beyond the 180–degree point, it will damage your tablet PC.

1. Open the display of the Tablet PC.

2. Brace the base with one hand on the palm rest, grasp the top of the display with the other hand, and, following the directional arrow inscribed on the hinge cover, turn the rotating hinge clockwise 180–degree until you feel the display engage securely.

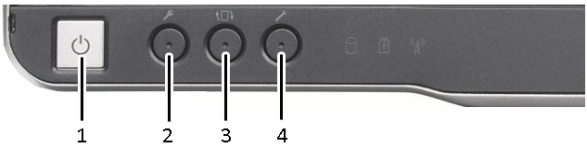
3. Brace the base with one hand on the palm rest, grasp the top of the display with the other hand, and, following the directional arrow inscribed on the hinge cover, turn the rotating hinge counter clockwise 180–degree until you feel the display engage securely.

4. Lay the display assembly on the base with the display facing upwards.

Portrait orientation refers to tablet mode usage in which the user holds the system with primary focus on the vertical space. **Landscape** orientation refers to tablet mode usage in which the user holds the system with primary focus on the horizontal space. By definition, notebook mode is always in landscape orientation.

Tablet PC Buttons

Your Tablet PC has three tablet buttons located beside the power button. In order for these buttons to function properly, Dell Control Point System Manager must be installed.



1. Power button — Used to power the computer On or Off.
2. Windows security button — If you use your Tablet-PC in tablet mode, press this button to access the Windows Task Manager dialog box or a login screen, the same way you use the <Ctrl><Alt><Del>key sequence in the notebook mode.
3. Screen rotate button — While the Tablet-PC is in tablet mode, use the screen rotate button to change the display orientation from portrait to landscape mode or landscape to portrait. Each time you press and release the screen rotate button, the screen image rotates clockwise 90 degrees.
4. Dell control point button — Press this button to view and configure options for the Tablet PC and the pen through Dell Control Point System Manager.

Scroll Buttons

Your Tablet-PC has two scroll buttons.

Figure 1. Scroll Buttons

1. Scroll control
2. Back button

Using the Scroll Control

- To scroll through a list of items or a set of pages one at a time, shift the scroll control up or down and release. The control automatically returns to the center/neutral position when released.
- To rapidly scroll through a list of items or a set of pages, shift the control up or down and hold it, releasing it when you wish to stop scrolling.

- To select objects, press and release the scroll control when it is in the center/neutral position.
- To launch context sensitive menus, press and hold the scroll control until a complete circle is drawn on the display then release. This is equivalent to clicking the right mouse button on a notebook computer.

Using the Back Button

- To move backward, press and release the back button.
- To close the active window, press and hold the back button.
- To customize the back button behavior, use the Tablet and Pen Settings.

Tablet PC Interface

Your Tablet PC is offered with the following operating systems:

- Microsoft Windows XP
- Windows Vista
- Windows 7

There are several differences in the Tablet PC interfaces between the three operating systems. The primary difference are listed below.

Feature	Description	Windows Vista/ Windows 7	Microsoft Windows XP
Touch	Ability to use finger as an input device.	Yes	Yes
Windows Journal	Native note-taking application which takes input directly from pen or touch.	Yes	Yes
Snipping Tool	Tool used to capture portions of visual data (documents, pictures, etc.) via pen or touch.	Yes	Yes
Flicks	Gesture activated shortcuts for common tasks.	Yes	No
Check Boxes	Visual identifier in folders for selecting files.	Yes	No
Cursor Feedback	Visual indicator for tap location.	Yes	No
Tablet Input Panel	Tool used to input data via pen or touch that takes the place of a keyboard.	Yes	Yes

Feature	Description	Windows Vista/ Windows 7	Microsoft Windows XP
Input device-sensitive tools	Tablet Input Panel and icon change size according to pen or touch being used.	Yes	No
Tablet Cursor	Special Tablet cursor used for Tablet-PC functions as opposed to a standard mouse pointer.	Yes	No
Touch Widget	Separate tool that appears in Touch Mode used for right-clicking purposes.	Yes	No
Cursor Feedback	Ability to see if the target has been hit by using visual feedback for success.	Yes	No

Using Your Tablet PC in Windows 7

Your Tablet PC uses several input devices. The standard keyboard touch pad are present, plus you can opt for the electrostatic pen or just use your finger as an input device.

Touch Usage

The key advantage of your Tablet PC is the ability to easily switch from pen input to touch input. When you use Touch Mode, a translucent image of a computer mouse, called the touch pointer, floats beneath your finger. The touch pointer has left and right mouse buttons that you can tap with your finger. You use the area beneath the buttons to drag the touch pointer.

To enable the touch pointer:

- Go to **Start**> **Control Panel**> **Pen and Touch** and click the **Touch** tab.
- On the **Touch Pointer** section, select the **Show the touch pointer when I'm interacting with items on the screen** option.

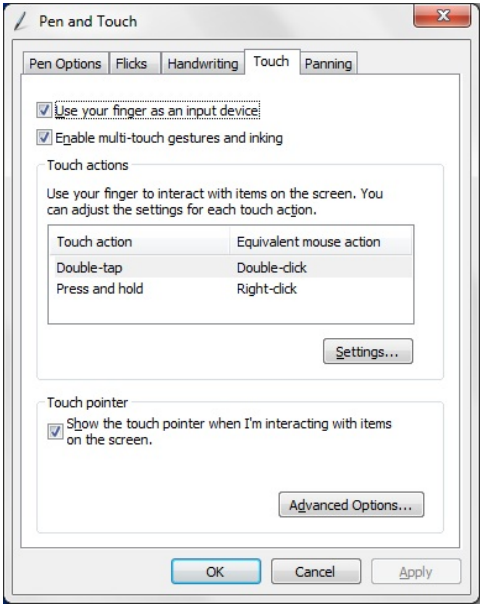


Figure 2. Pen and Touch — Touch Usage

Using Pen as a Mouse

You can use the pen the same way you use a mouse or touch pad with a notebook computer. Holding the pen near the display makes a small cursor appear. Moving the pen moves the cursor. The table below describes how to use the pen.

Function	Action
Single-click on a mouse	Gently tap the pen tip on the screen of your Tablet PC.
Double-click on a mouse	Gently tap the pen tip twice in quick succession on the screen of your Tablet PC.
Right-click on a mouse	Touch the pen on the screen and hold it in place momentarily until Windows draws a complete circle around the cursor.

Working With Files

You can open, delete, or move many files or folders at one time by selecting multiple items from a list. Using a tablet pen, hover over one item at a time and select the check box that appears to the left of each item.

To activate the check boxes:

1. Go to **Control Panel**.
2. Go to **Folder Options.**
3. Click **View** .
4. Under **Advanced settings**, select the **Use check boxes to select items check box**, and then click **OK**.

Using Pen as a Pen

The handwriting recognition software makes it easy to enter text into your applications with the pen. Some applications, such as Windows Journal, allow you to write with the pen directly into the application window.

The primary features of Pen option are:

- Tablet PC Input Panel
- Pen Flicks

Using Tablet PC Input Panel

Tablet PC input panel allows you enter text into your applications, when an application does not directly support pen input.

You can access the Tablet PC input panel performing either of the following actions:

- Tap your pen in an editable area in the application. The Tablet PC Input Panel icon appears. Tapping the Tablet PC icon makes Input Panel slide out from the edge of the display.
- Tap the Input Panel tab, which is docked at the edge of the screen when the Input Panel is hidden.
- You can move the Input Panel tab by dragging it up or down along the edge of the screen. Then, when you tap it, the Input Panel opens at the same horizontal location on the screen that the tab appears.

Figure 3. Table PC Input Panel

The writing pad and character pad have a number pad, a symbol pad, and web quick keys to help you quickly and accurately enter these types of text. These quick keys are hidden when you start to write, but appear after you insert or delete your writing.

NOTE: By default, Input Panel automatically switches to the touch keyboard when you place the insertion point in a box for entering a password.

Entering Text

You can use handwriting recognition or the touch keyboard to enter text. The writing pad and character pad have a number pad, a symbol pad, and web quick keys to help you quickly and accurately enter these types of text. These quick keys are hidden when you start to write, but appear after you insert or delete your writing. The following table displays the Input Panel icons and their functions.

Icon	Name	Function
	Hand writing recog nition	The writing pad and character pad convert handwriting into typed text. You can write continuously on the writing pad, like writing on a piece of lined paper. Use the character pad to enter one character at a time. The character pad converts your handwriting to typed text, one letter, number or symbol at a time, but doesn't take the context of the full word into account and doesn't take advantage of the handwriting dictionary. To switch to the character pad in Input Panel, tap **Tools**, and then write character by character
	Touch keybo ard	The touch keyboard is like a standard keyboard, but you enter text by tapping the keys with your tablet pen or finger.

NOTE: By default, the Input Panel automatically switches to the touch keyboard when you place the insertion point in a box for entering a password.

Pen Flicks

Pen flicks allow you to use the pen to perform actions that normally require a keyboard, such as pressing **<Page Up>**or using the directional arrow keys. Pen flicks are quick,

directional gestures. When a pen flick is recognized, the Tablet PC performs the action assigned.

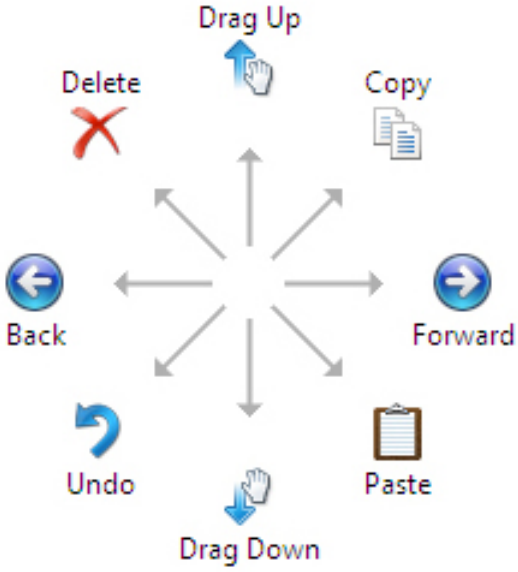


Figure 4. Default Pen Flicks

You can customize the pen flicks by performing the following action:

- **Start→Control Panel→ Pen and Touch** and clicking on the **Flicks** tab.

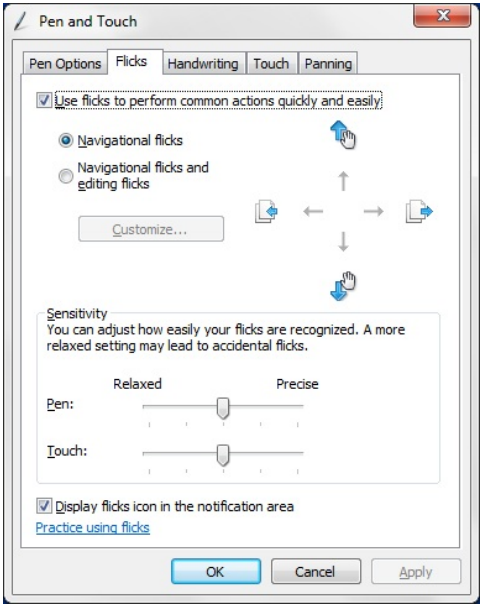


Figure 5. Pen and Touch — Pen Flicks

Using Your Tablet PC in Windows XP

You can use different input devices on your Tablet PC. The standard keyboard touch pad are present, you can also opt for the electrostatic pen or just use your finger as an input device

Using Pen as a Mouse

You can use the pen the same way you use a mouse or touch pad with a notebook computer. Holding the pen near the display makes a small cursor appear. Moving the pen moves the cursor. Tapping on the screen once is the same as clicking with a mouse. A double-tap constitutes a double-click. Right-clicking with the pen is accomplished by holding the pen tip down on the screen until a red circle surrounds the pointer as illustrated below. Lifting the pen from the specific location opens up the corresponding submenu.

Figure 6. Pointer Indicator

Using Pen as a Pen

The native handwriting recognition software makes it easy to enter text into your applications with the pen. Some applications, such as Windows Journal, allow you to write with the pen directly into the application window.

Tablet PC Input Panel

You can use the Tablet PC input panel to enter text into your application, when the application does not directly support pen input.

You can access the Tablet PC input panel by tapping your pen in an editable area in the application. The Tablet PC Input Panel icon appears.

You can use the writing pad, the character pad, or the on-screen keyboard to enter text. The writing pad and the character pad convert your handwriting into typed text. The on-screen keyboard works just like a standard keyboard except that you enter text by tapping keys with your tablet pen. The following table describes the different choices for using the Input Panel.

Touch Usage

The key advantage of your Tablet-PC is the ability to easily switch from pen input to touch input. Similar to how the pen works, tapping with your finger on the screen once is the same as clicking with a mouse. A double-tap constitutes a double-click. Right-clicking in Touch Mode is accomplished by holding your finger tip down on the screen until a red circle surrounds the pointer. This can be difficult to see as often times user's fingers cover the pointer. Lifting your finger from this point opens up the corresponding submenu.

Tablet and Pen Settings

You can access the Table and Pen Settings from the Control Panel. You can also access it from the Dell Control Point Manager.

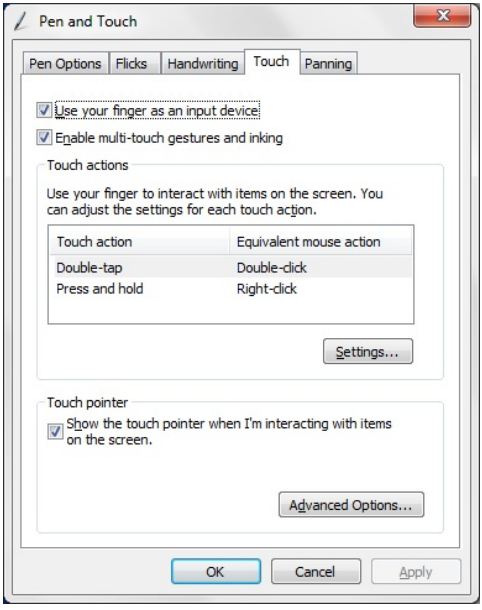


Figure 7. Pen and Touch Window

The following are the different sections that is available in the Pen and Touch window. They are:

- Settings — Allows you to define the right/left handedness, location of the menu and calibration settings.
- Display — Allows you to define the screen orientation and set the screen brightness.
- Tablet Buttons — Allows you to define the button settings.
- Pen Options — Allows you to define the different actions of the pen and the pen buttons for different functions.

.

Tablet PC Settings

The **N-trig DuoSense Digitizer Settings** applet is used to adjust several settings for the digitizer. the N-trig applet icon appears in the system tray. Hovering over the icon with your pointer displays the firmware version number. Right-clicking the icon brings up the sub menu of **Properties** and **About** options. The tabs on the **N-trig DuoSense Digitizer Settings** window are:

- Digitizer Options

- Pen
- Interactive Options

Digitizer Options Tab

The Digitizer Options tab is used for the following

- Input mode selection
- Touch tuning

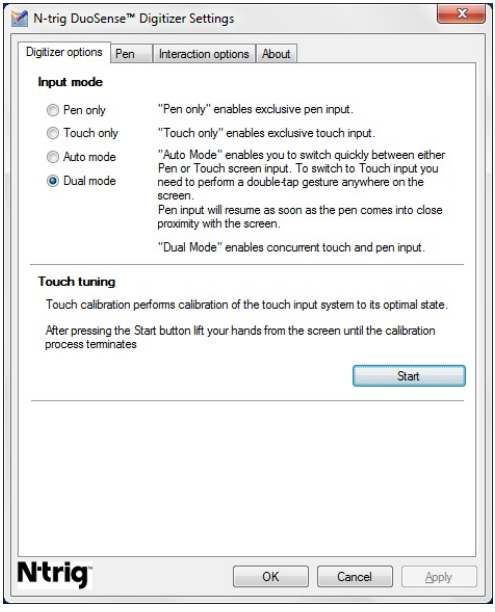


Figure 8. N-trig DuoSense Digitizer Settings — Digitizer options

Input Mode

The **N-trig DuoSense Digitizer** applet has four operating modes:

- **Pen only**— In this mode, the stylus is the only device that can be used as the input device with the N-trig digitizer. To change from Pen only mode to any other mode:

  a. Click or tap on the N-trig applet icon in the system tray.

  b. On the applet window, select the desired mode and click **OK**

- **Touch only** — In Touch only mode, a single finger is the only input device that can be used with the N-trig digitizer. Using the stylus is not possible.

NOTE: Only a single hand contact is allowed with the digitizer for proper execution.

To change from Touch only mode:

a. Click or tap on the N-trig applet icon in the system tray.

b. On the applet window, select the desired mode and click **OK**

- **Auto Mode**— The N-trig digitizer is capable of detecting a stylus as well as finger touch. The purpose of Auto mode is to allow the user intuitive toggling between the Pen only and Touch only modes. The default input device for Auto mode is the stylus as long as it is in range of the tablet screen (hovering in proximity or in contact). A basic principle in Auto mode is that stylus detection in the digitizer proximity would turn the digitizer into Pen only mode as an overriding priority. A double-tap finger gesture on the screen (similar in style to a mouse double-click) will switch the digitizer from Pen only mode to Touch only mode. The system will remain in Touch only mode as long as the stylus is out of range. Once the stylus is detected in range the system will automatically switch to Pen only mode.
- **Dual Mode (Windows Vista and Windows 7)** — Dual mode is a unique operational mode that is functional only while using the Windows Vista and Windows 7 operating system. In this mode, the operating system switches automatically between the available pointing device according to its internal priority and attributes.

Touch Tuning

Touch calibration performs calibration of the touch input system to its optimal state. If the tablet's finger detection is not working properly, you may have to re-calibrate the touch feature. To re-calibrate the touch feature:

1. Click the **Start** button and then follow the on-screen prompts.

.

NOTE: Do not touch the screen when the touch reset is in progress.

Pen Tab

The Pen tab allows you to:

- define the pen supported features
- view the pen battery status

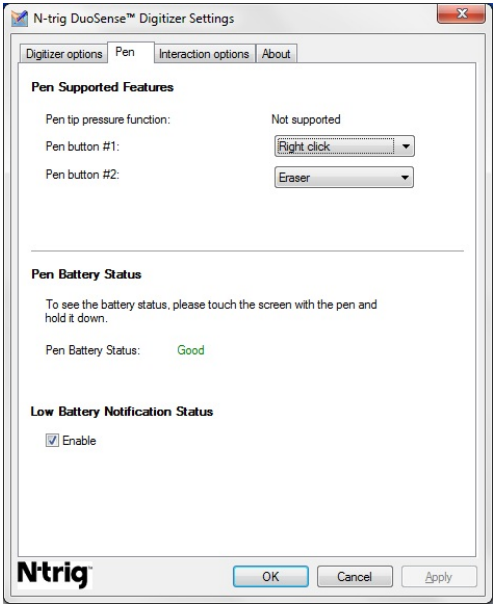


Figure 9. N-Trig DuoSense Digitizer Settings — Pen

Pen Features and Pen Battery Status

You can configure the pen buttons. There are two buttons on the pen and they are referred as:

- Pen button #1 — This button is defined as the lowermost button on the pen shaft. By default, this button set to right-click functionality.
- Pen button #2 — This button is located directly above the primary button. By default, this button is set to eraser functionality.

You can change button functions to perform different functions. The options available are:

- Disabled
- Right-click
- Eraser

In the Pen tab you can view status of the battery inserted in the pen. To see the battery status, simply touch the screen with the pen and hold it down

Interaction Options Tab

In the Interaction Options tab, you can control the sound effects when operating the system in various modes.

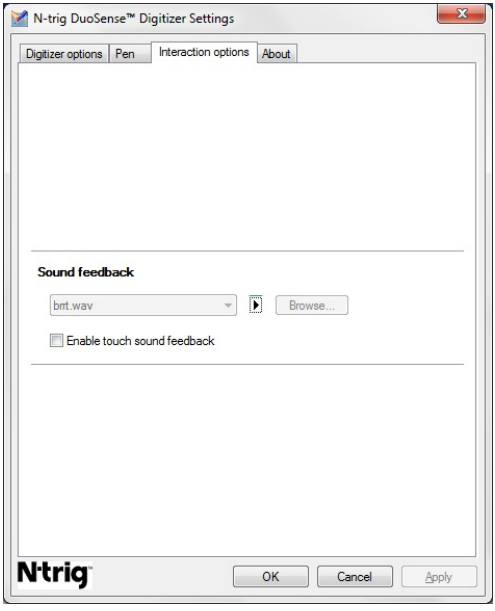


Figure 10. N-trig Duo Sense Digitizer Settings — Interaction options

You can select the .WAV file that need to be played when the finger touches the screen. Click the Play button icon to test the sound.

Troubleshooting for N-Trig Digitizer

Installation Issues

- Error message during installation — **Hardware is not adequate for running this software**
  - Check if the bundle you are trying to run is for the appropriate operating system (Windows 7 or Windows Vista or Windows XP).
  - Check if the bundle you are trying to run is of the correct version (32 bit or 64 bit).
- Installing Windows Vista/Windows XP bundle over Windows 7 firmware.
  - If you have downgraded the operating system on your Tablet from Windows 7 to Windows Vista/Windows XP without uninstalling the N-Trig bundle, the version

of the firmware on the digitizer will remain unchanged and will be compatible for Windows 7. To revert the firmware to the default version, you have to rollback the application

- Installing Windows 7 bundle over Windows Vista/Windows XP
  - If you have upgraded the operating system to Windows 7 from Windows Vista/ Windows XP, without uninstalling the N-Trig bundle, the firmware will remain unchanged and will be compatible for Windows Vista/Windows XP. The Windows 7 bundles already contains the firmware rollback application. It will run the rollback tool and then continue to install the Window 7 bundle installation.

Performance Issues

- No multi touch functionality
  a. Check if the N-trig bundle is installed.
  b. Open **Control Panel** and the **N-trig DuoSense Digitizer Settings** icon must be displayed. If the bundle is not installed. Install the relevant bundle for the operating system installed on the computer.
  c. Check the system information to see how many touch points are detected.
     1. Click on **Start**.
     2. Right click on **Computer** and select **Properties** from the menu.
     3. Number of touch points should be written in the information window .

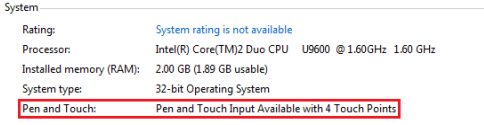


Figure 11. System Information — Touch Points for Pen and Touch Input

NOTE: In Windows Vista and Windows XP bundles there are no 4 points multi touch after bundle installation. The Vista/XP bundles support single touch and gestures (two fingers).

- Bundle is installed but touch functionality is missing
  a. Open the **Device Manager** and check that the Digitizer is recognized by the computer.

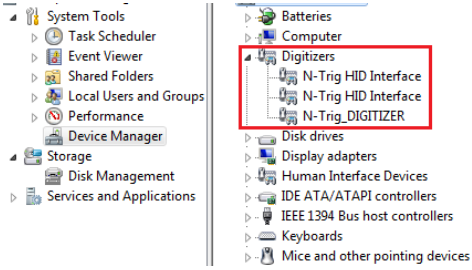


Figure 12. Device Manager — Digitizers

b. If the device is recognized, try to uninstall the N-trig bundle and reinstall.

c. If the device is not recognized, check if you see it under **Unknown Devices** and update the driver for the unknown device

d. In Windows 7, after successfully installing the N-trig bundle you have to check if the **Tablet PC Components** check box (in Windows Features) is selected.

1. Go to **Control Panel** --> **Programs and Features.**
2. In the Programs and Features window, click the **Turn Windows Features On/Off** link, located in the left sidebar
3. Check if the **Tablet PC Components** check box is selected.

Removing the Battery

1. Follow the procedures in Before Working On Your Computer.
2. Slide the release latch to unlock the battery.

3. Remove the battery from the computer.

Installing the Battery

1. Slide the battery back into the computer.
   The release latch automatically click into the lock position.
2. Follow the procedures in After Working Inside Your Computer.

3

Subscriber Identity Module (SIM) Card

Removing the Subscriber Identity Module (SIM) Card

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Press and release the SIM card located on the battery wall.

4. Slide the SIM card from the computer.

Installing the Subscriber Identity Module (SIM) Card

1. Insert the SIM card into the slot.
2. Replace the battery.
3. Follow the procedures in After Working Inside Your Computer.

4

ExpressCard

Removing the ExpressCard

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Press in on the ExpressCard.

4. Slide the ExpressCard out of the computer.

Installing the ExpressCard

1. Insert the ExpressCard into the slot until it clicks into place.
2. Follow the procedures in After Working Inside Your Computer.

5

Back Panel

Removing the Back Panel

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the screws that secure the back panel.

4. Slide the back panel toward the back of the computer and lift it away from the computer.

Installing the Back Panel

1. Attach the back panel to the back of the computer.
2. Tighten the screws to secure the back panel.
3. Replace the battery.
4. Follow the procedures in After Working Inside Your Computer.

6

Hard Drive

Removing the Hard Drive Assembly

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the screws that secure the hard drive to the computer.

5. Pull the hard drive out of the computer.

6. Remove the screw from the hard-drive bracket.

7. Remove the hard-drive bracket and slide the rubber from the hard drive.

Installing the Hard Drive Assembly

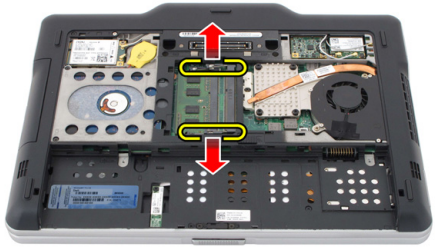
1. Attach the hard-drive bracket and the rubber to the hard drive.
2. Tighten the screw to secure the hard-drive bracket and the rubber.
3. Insert the hard drive into the compartment.
4. Tighten the screws to secure the hard drive to the computer.
5. Replace the back panel.
6. Replace the battery.
7. Follow the procedures in After Working Inside Your Computer.

7

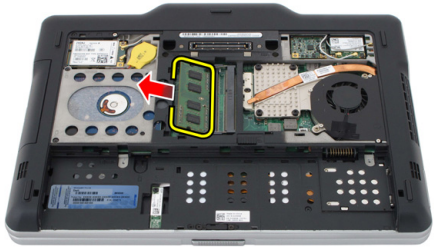
Memory

Removing the Memory

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Pry the retention clips away from the memory module.



5. Remove the memory module from the computer.



Installing the Memory

1. Insert the memory module into the slot.
2. Press down the memory until the securing clips secure the memory.
3. Replace the back panel.
4. Replace thebattery.
5. Follow the procedures in After Working Inside Your Computer.

8

Bluetooth Card

Removing the Bluetooth Module

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the screw that secures the bluetooth module.

4. Disconnect the bluetooth cable from the bluetooth module.

5. Remove the bluetooth module.

Installing the Bluetooth Module

1. Place the bluetooth module on the slot in the battery compartment.
2. Connect the bluetooth cable to the bluetooth module.
3. Tighten the screw to secure the bluetooth to the computer.
4. Replace the battery.
5. Follow the procedures in After Working Inside Your Computer.

9

Wireless Local Area Network (WLAN) Card

Removing the Wireless Local Area Network (WLAN) Card

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Disconnect the WLAN antenna cables from the card.

5. Remove the screw that secures the WLAN card to the system board.

6. Remove the WLAN card from the computer.

Installing the Wireless Local Area Network (WLAN) Card

1. Insert the WLAN card into the slot.
2. Tighten the screws to secure the WLAN card to the system board.
3. Connect the antenna cables to the WLAN card.
4. Replace the back panel.
5. Replace the battery.
6. Follow the procedures in After Working Inside Your Computer.

10

Wireless Wide Area Network (WWAN) Card

Removing the Wireless Wide Area Network (WWAN) Card

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Disconnect the WWAN antenna cables from the card.

5. Remove the screw that secures the WWAN card to the system board.

6. Remove the WWAN card from the computer.

Installing the Wireless Wide Area Network (WWAN) Card

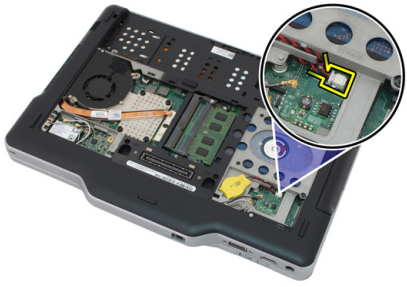
1. Insert the WWAN card into the slot.
2. Tighten the screws to secure the WWAN card to the system board.
3. Connect the antenna cables to the WWAN card.
4. Replace the back panel.
5. Replace the battery.
6. Follow the procedures in After Working Inside Your Computer.

11

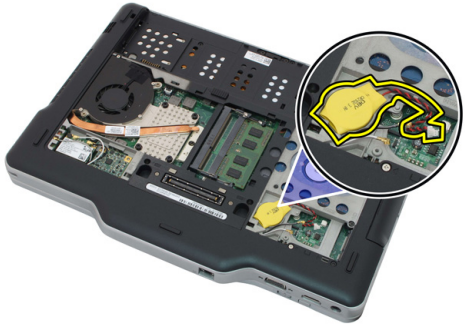
Coin-Cell Battery

Removing the Coin-Cell Battery

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the WWAN card.
5. Disconnect the coin-cell battery cable from the system board.



6. Remove the coin-cell battery.



Installing the Coin-Cell Battery

1. Place the coin-cell battery into the slot.
2. Connect the coin-cell battery cable to the system board.
3. Replace the WWAN card.
4. Replace the back panel.
5. Replace the battery.
6. Follow the procedures in After Working Inside Your Computer.

12

Base Cover

Removing the Base Cover

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the hard drive assembly.
5. Remove the screws that secure the base cover.

6. Disengage the base cover from the edges and remove it from the computer

Installing the Base Cover

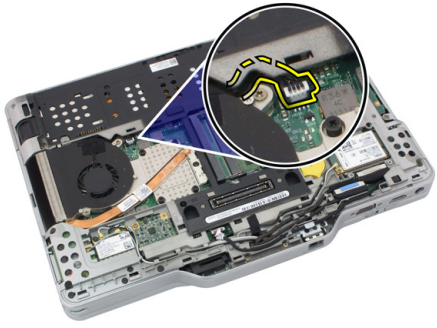
1. Attach the base cover until the edges snap into place.
2. Tighten the screws to secure the base cover.
3. Replace the hard drive assembly.
4. Replace the back panel.
5. Replace the battery.
6. Follow the procedures in After Working Inside Your Computer.

13

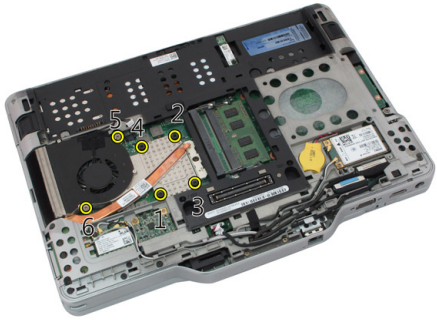
Heat Sink

Removing the Heat Sink

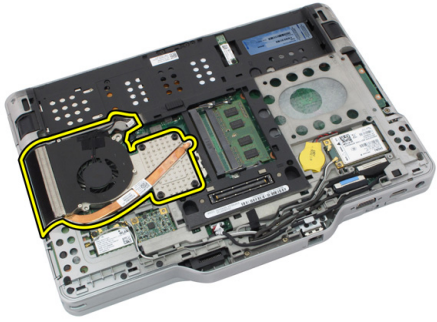
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the hard drive assembly.
5. Remove the base cover.
6. Disconnect the fan cable from the system board



7. Loosen the captive screws on the heat sink and remove the screws on the fan.



8. Lift the heat sink to remove it from the computer.



Installing the Heat Sink

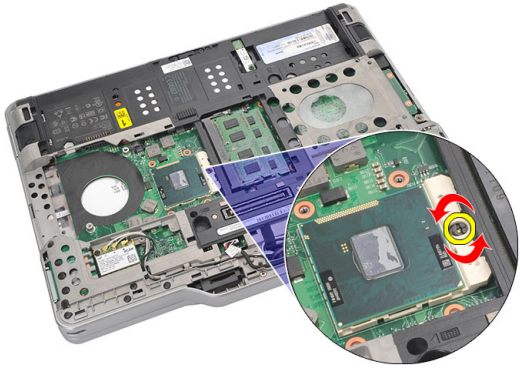
1. Place the heat sink in the heat sink compartment.
2. Tighten the captive screws to secure the heat sink.
3. Tighten the screws to secure the fan to the system board.
4. Connect the fan cable to the system board.
5. Replace the back cover.
6. Replace the hard drive assembly.
7. Replace the back panel
8. Replace the battery.
9. Follow the procedures in After Working Inside Your Computer.

14

Processor

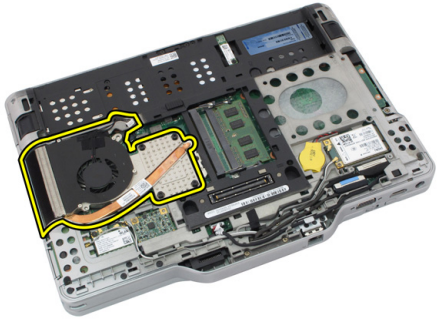
Removing the Processor

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the hard drive assembly.
5. Remove the base cover.
6. Remove the heat sink.
7. Rotate the processor-cam screw in counter-clockwise direction.



8. Lift and remove the processor from the computer.

9. Lift the heat sink up to remove it from the computer.



Installing the Processor

1. Insert the processor into the socket.
2. Tighten the processor-cam screw in clockwise direction to secure the processor.
3. Replace the heat sink.
4. Replace the base cover.
5. Replace the hard drive assembly.
6. Replace the back panel.
7. Replace the battery.
8. Follow the procedures in After Working Inside Your Computer.

15

Keyboard Trim

Removing the Keyboard Trim

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Disengage the keyboard trim and remove it from the computer.

Installing the Keyboard Trim

1. Press the keyboard trim down along all the edges, until it clicks into place.
2. Replace the battery.
3. Follow the procedures in After Working Inside Your Computer.

16

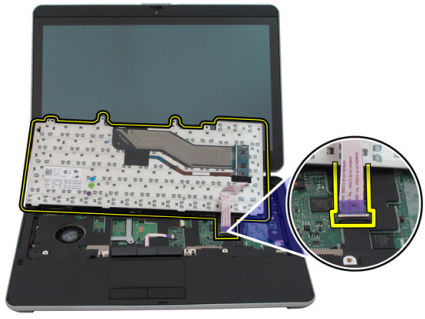
Keyboard

Removing the Keyboard

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the screws that secure the keyboard on the back of the computer.

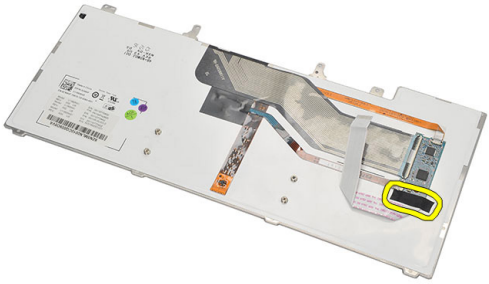
6. Flip the computer and remove the screws that secure the keyboard.

7. Flip the keyboard and disconnect the keyboard-data cable from the system board.



8. Remove the keyboard from the computer.

9. Peel off the mylar tape that secures the keyboard data cable to the back of the keyboard.



Installing the Keyboard

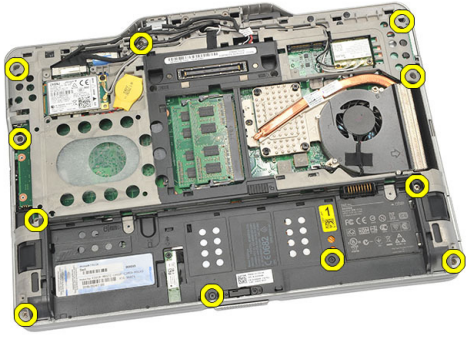
1. Affix the mylar tape to secure the keyboard data cable to the back of the keyboard.
2. Place the keyboard on the palmrest to align with the screw holes.
3. Connect the keyboard data cable to the system board.
4. Tighten the keyboard screws.
5. Flip the computer and tighten the screws to secure the keyboard to the system board.
6. Replace the keyboard trim.
7. Replace the back cover.
8. Replace the battery.
9. Follow the procedures in After Working Inside Your Computer.

17

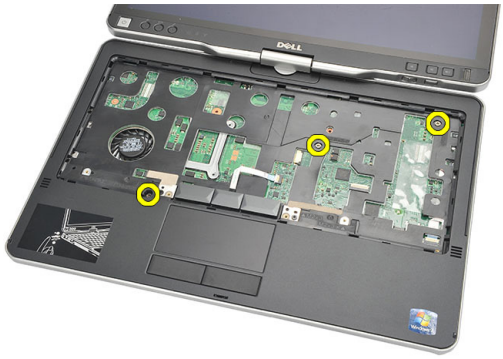
Palmrest

Removing the Palmrest

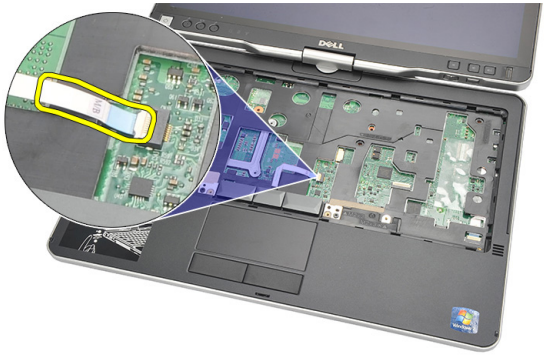
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the back cover.
7. Remove the screws that secure the palmrest to the back of the computer.



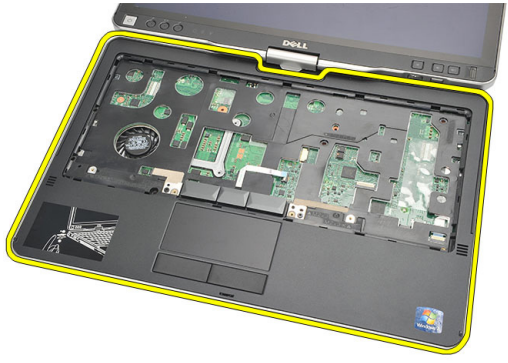
8. Flip the computer and remove the screws that secure the palmrest.



9. Disconnect the touchpad cable from the system board.



10. Lift the palmrest and remove it from the computer.



Installing the Palmrest

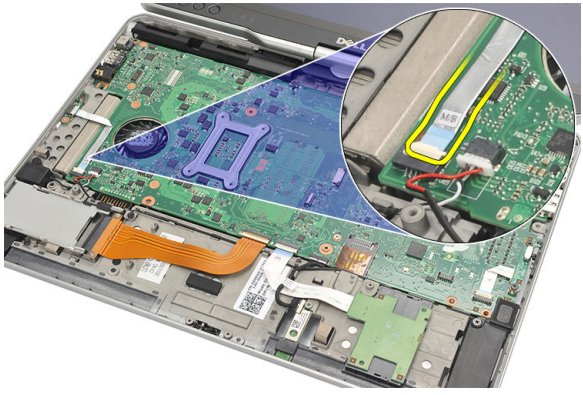
1. Connect the touch pad cable to the system board.
2. Tighten the screws on the palmrest.
3. Flip the computer and tighten the screws to secure the palmrest to the system board.
4. Replace the base cover.
5. Replace the hard drive assembly.
6. Replace the keyboard.
7. Replace the keyboard trim.
8. Replace the back panel.
9. Replace the battery.
10. Follow the procedures in After Working Inside Your Computer.

18

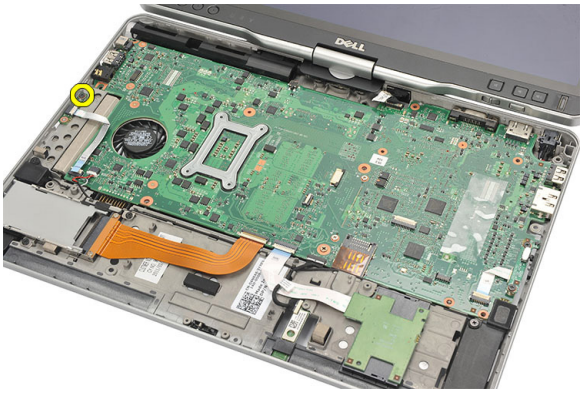
Display Closure Sensor

Removing the Display Closure Sensor

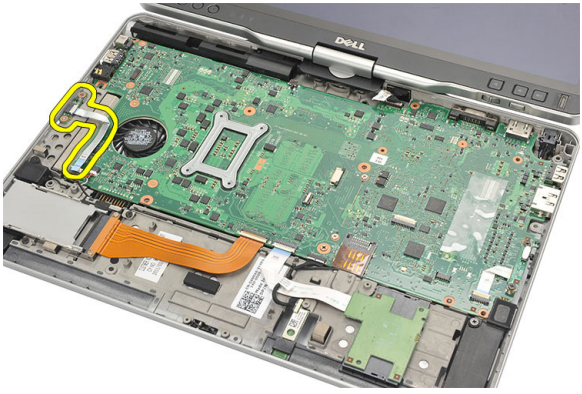
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the base cover.
7. Remove the palmrest.
8. Disconnect the display closure sensor flex cable from the system board.



9. Remove the screw that secures the display closure sensor.



10. Remove the display closure sensor from the computer.



Installing the Display Closure Sensor

1. Place the display closure sensor in the compartment.
2. Tighten the screw to secure the display closure sensor to the system board.
3. Connect the display closure sensor flex cable to the system board.
4. Replace the palmrest.
5. Replace the base cover.
6. Replace the hard drive assembly.
7. Replace the keyboard.
8. Replace the keyboard trim.
9. Replace the back panel.
10. Replace the battery.

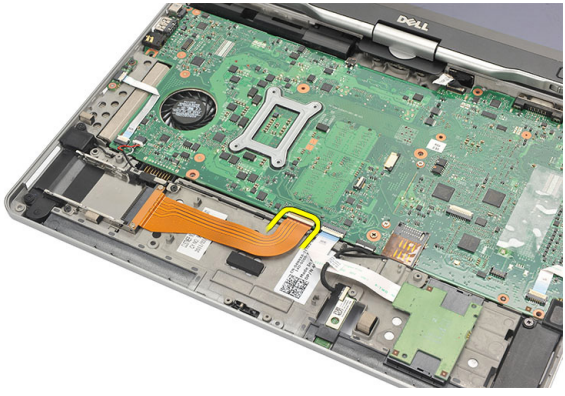
11. Follow the procedures in After Working Inside Your Computer.

19

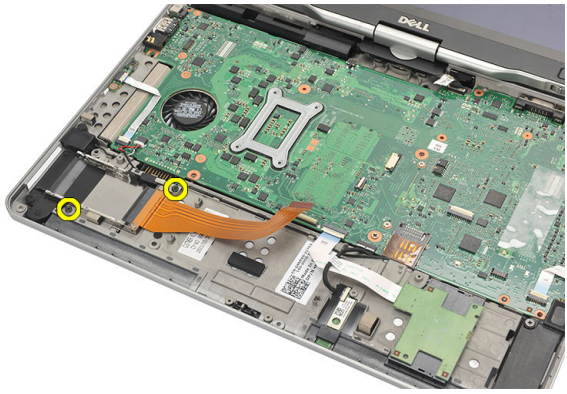
ExpressCard Reader

Removing the ExpressCard Reader

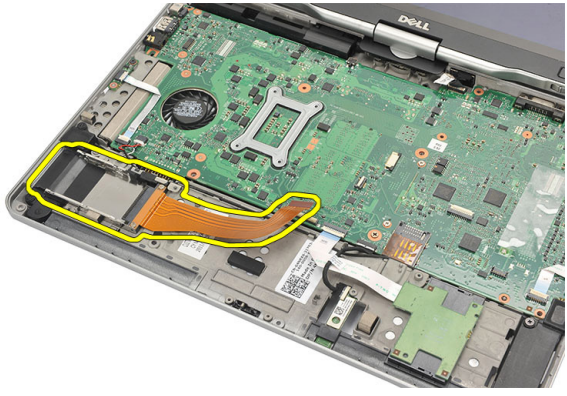
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the base cover.
7. Remove the palmrest.
8. Disconnect the ExpressCard reader's flat flex conductor (FFC) cable from the system board.



9. Remove the screws that secure the ExpressCard reader.



10. Push the ExpressCard reader towards the side and remove it from the computer.



Installing the ExpressCard Reader

1. Insert the ExpressCard reader in the compartment.
2. Tighten the screws to secure the ExpressCard reader to the back of the computer.
3. Connect the ExpressCard reader's flex cable to the system board.
4. Replace the palmrest.
5. Replace the back cover.
6. Replace the hard drive assembly.
7. Replace the keyboard.
8. Replace the keyboard trim.
9. Replace the back cover.
10. Replace the battery.

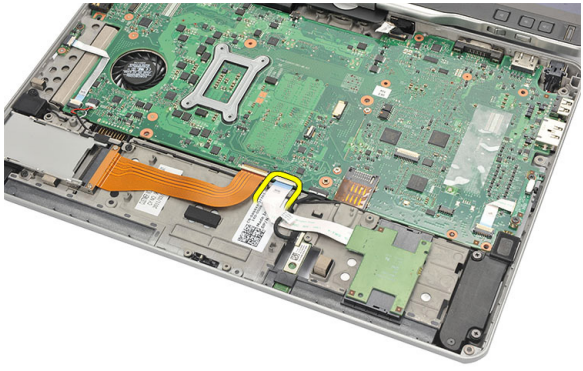
11. Follow the procedures in After Working Inside Your Computer.

20

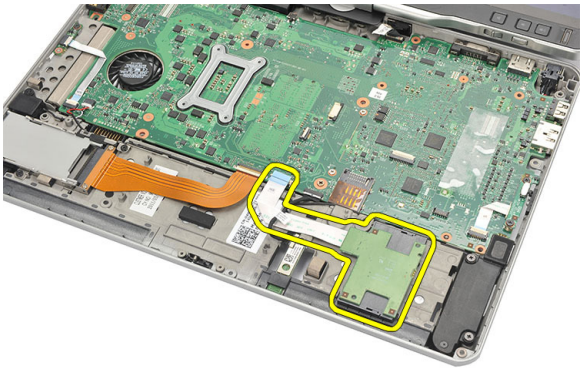
Smart Card Reader

Removing the Smart Card Reader

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the base cover.
7. Remove the palmrest.
8. Disconnect the smart card reader flex cable from the system board.



9. Lift and remove the smart card reader from the computer.



Installing the Smart Card Reader

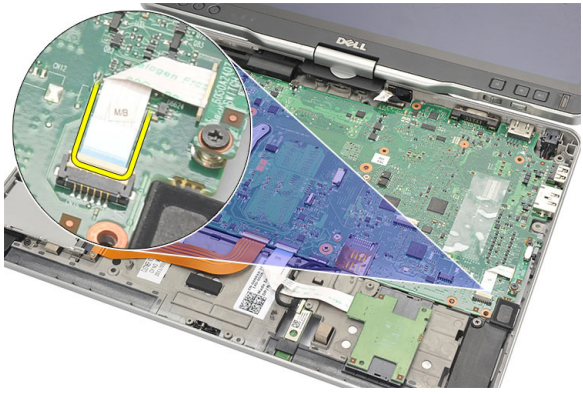
1. Place the smart card reader in the compartment.
2. Connect the smart card reader flex cable to the system board.
3. Replace the palmrest.
4. Replace the back cover.
5. Replace the hard drive assembly.
6. Replace the keyboard.
7. Replace the keyboard trim.
8. Replace the back panel.
9. Replace the battery.
10. Follow the procedures in After Working Inside Your Computer.

21

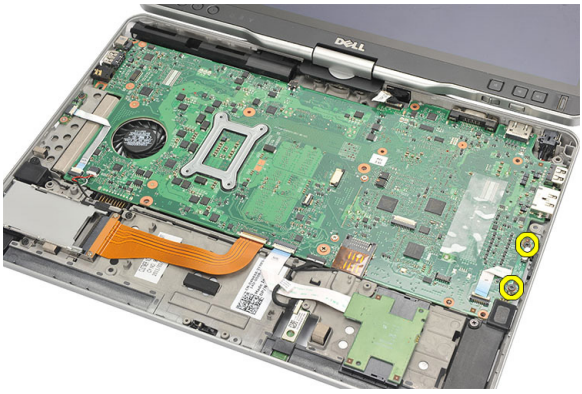
Wireless Switch

Removing the WLAN Switch Board

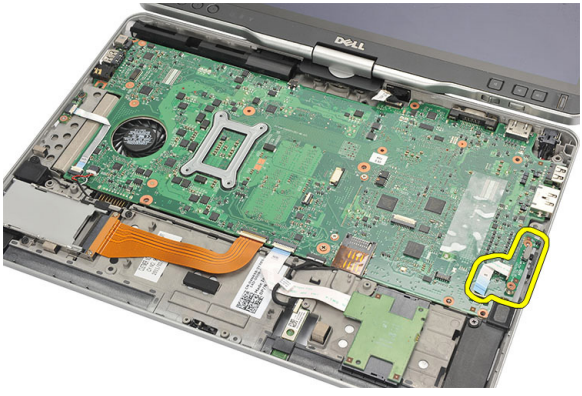
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery .
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the base cover.
7. Remove the palmrest.
8. Disconnect the WLAN switch board flex cable from the system board.



9. Remove the screws that secure the WLAN switch board to the computer.



10. Remove the WLAN switch board from the computer.



Installing the WLAN Switch Board

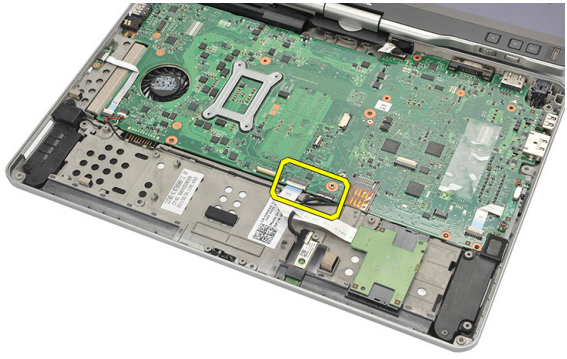
1. Place the WLAN switch board in the compartment.
2. Tighten the screws to secure the WLAN switch board.
3. Connect the WLAN switch board flex cable to the system board.
4. Replace the palmrest.
5. Replace the base cover.
6. Replace the hard drive assembly.
7. Replace the keyboard.
8. Replace the keyboard trim.
9. Replace the back panel.
10. Follow the procedures in After Working Inside Your Computer.

22

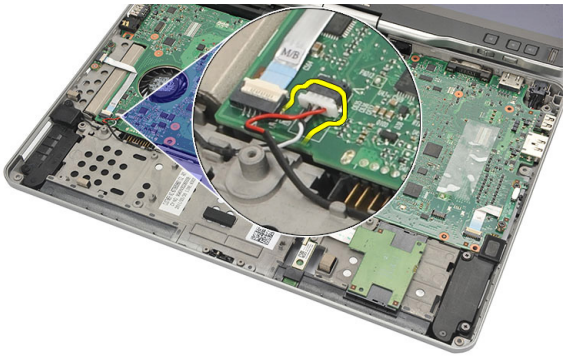
Speaker

Removing the Speakers

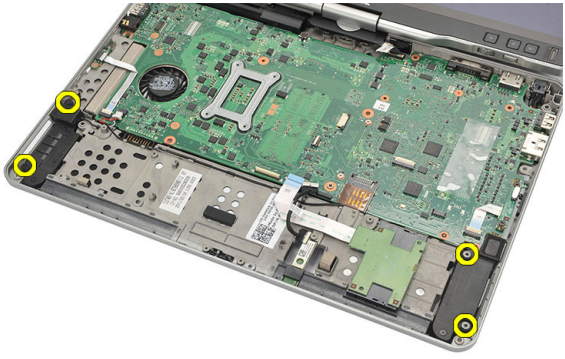
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the base cover.
7. Remove the ExpressCard reader.
8. Remove the palmrest.
9. Disconnect the smart card reader and bluetooth cables from the system board.



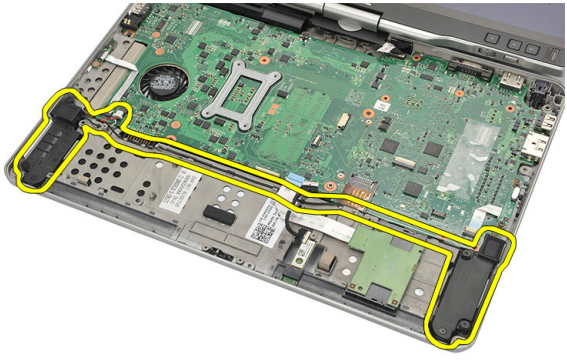
10. Disconnect the speaker cable from the system board.



11. Loosen screws that secure the speakers.



12. Unthread the speaker cable and remove the speakers from the computer.



Installing the Speakers

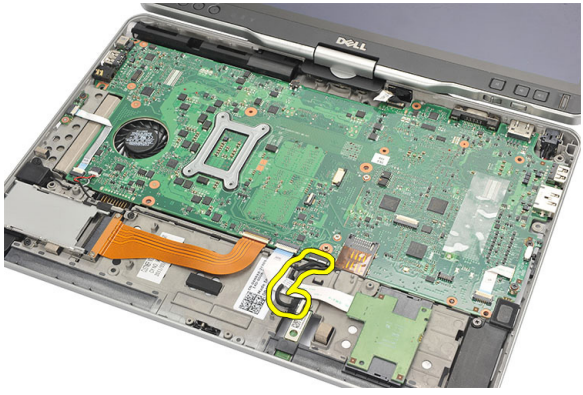
1. Connect the speaker cable to the system board.
2. Attach the speakers and thread the speaker cables through the holder.
3. Tighten the screws to secure the right and left speakers.
4. Connect the smart card reader and the bluetooth cables to the system board.
5. Replace the palmrest.
6. Replace the ExpressCard reader.
7. Replace the base cover.
8. Replace the hard drive assembly.
9. Replace the keyboard.
10. Replace the keyboard trim.
11. Replace the back panel
12. Replace the battery.
13. Follow the procedures in After Working Inside Your Computer.

23

Bluetooth Cable

Removing the Bluetooth Cable

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the base cover.
7. Remove the palmrest.
8. Disconnect bluetooth cable from the bluetooth module and the system board.



Installing the Bluetooth Cable

1. Connect the bluetooth cable to the bluetooth module and the system board
2. Replace the palmrest.
3. Replace the base cover.
4. Replace the hard drive assembly.
5. Replace the keyboard.

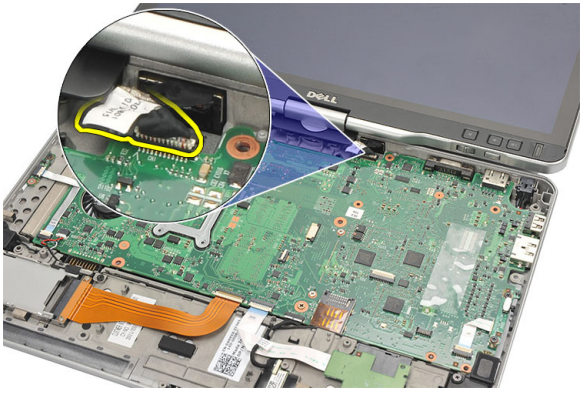
6. Replace the keyboard trim.
7. Replace the back panel.
8. Replace the battery.
9. Follow the procedures in After Working Inside Your Computer.

24

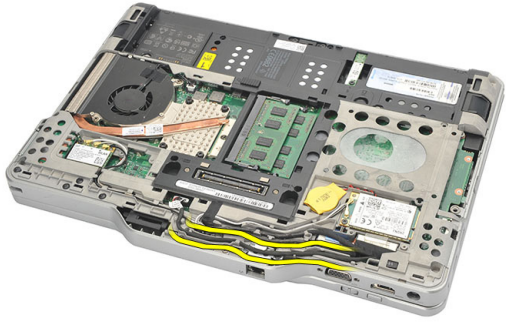
Modem Connector

Removing the Modem Connector

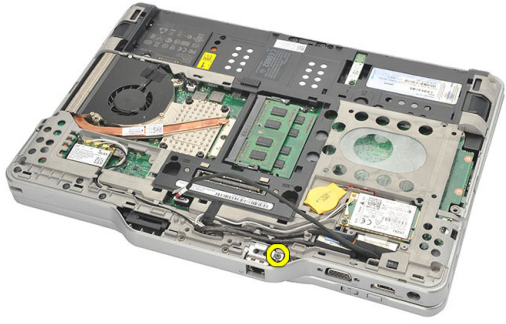
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the keyboard trim.
5. Remove the hard drive assembly.
6. Remove the back cover.
7. Remove the palmrest.
8. Disconnect the modem connector cable from the system board.



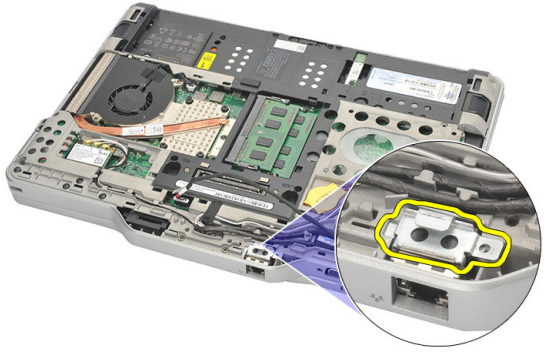
9. Unthread the DC-In cable from its route.



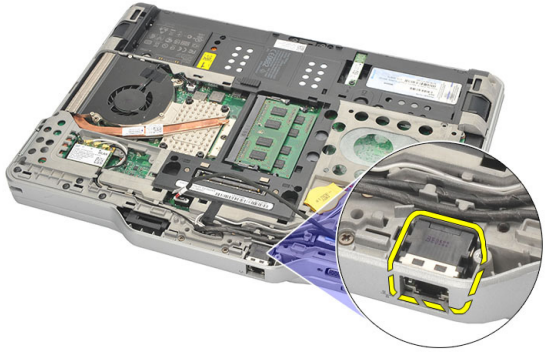
10. Remove the screw that secures the modem-connector bracket.



11. Lift and remove the modem-connector bracket.



12. Lift and remove the modem-connector.



Installing the Modem Connector

1. Insert the modem connector in the slot.
2. Attach the modem-connector bracket to the modem connector.
3. Tighten the screw to secure the modem connector.
4. Flip the computer and connect the modem-connector cable to the system board.
5. Replace the palmrest.
6. Replace the base cover.
7. Replace the hard drive assembly.
8. Replace the keyboard.
9. Replace the keyboard trim.
10. Replace the back panel.
11. Replace the battery.
12. Follow the procedures in After Working Inside Your Computer.

29

Display Bezel

Removing the Display Bezel

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Disengage the display bezel from the right edge and remove the top and the bottom bezel.

Installing the Display Bezel

1. Place the display bezel in line with the top cover.
2. Start from the lower corner and press the display bezel until it snaps into place.
3. Replace the battery.
4. Follow the procedures in After Working Inside Your Computer.

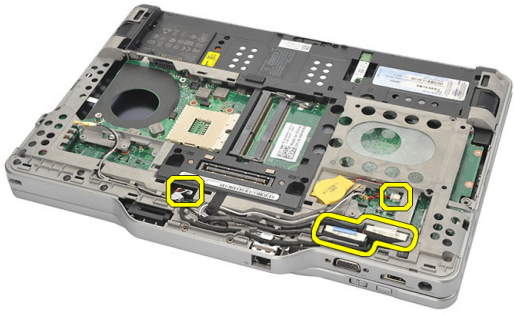
26

System Board

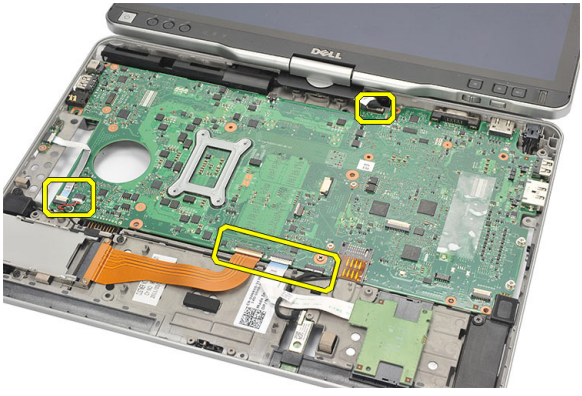
Removing the System Board

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the SIM card.
4. Remove the SD card.
5. Remove the back panel.
6. Remove the keyboard trim.
7. Remove the hard drive assembly.
8. Remove the memory.
9. Remove the WLAN card.
10. Remove the WWAN card.
11. Remove the base cover.
12. Remove the heat sink.
13. Remove the processor.
14. Remove the WLAN switch board.
15. Remove the palmrest.

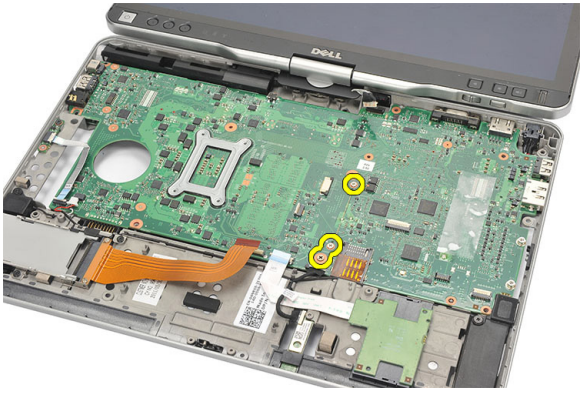
16. Disconnect the cables from the back of the computer.



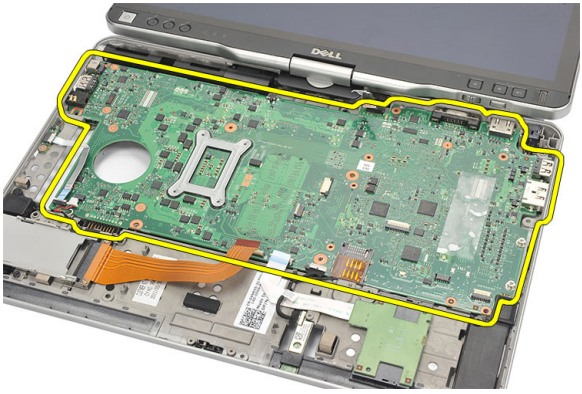
17. Flip the computer and disconnect the cables from the system board.



18. Remove the screws that secure the system board.



19. Lift the right edge of the system board to release it from the port connectors on the left and remove the system board.



Installing the System Board

1. Place the system board.
2. Tighten the screws to secure the system board.
3. Connect the cables to the system board.
4. Flip the computer and connect the cables to the back of the system board.
5. Flip the computer and connect the modem-connector cable to the system board.
6. Replace the palmrest.
7. Replace the WLAN switch board.
8. Replace the processor.
9. Replace the heat sink.
10. Replace the base cover.
11. Replace the WWAN card.
12. Replace the WLAN card.
13. Replace the memory.
14. Replace the hard drive assembly.
15. Replace the keyboard.
16. Replace the keyboard trim.
17. Replace the back panel.
18. Replace the SD card.
19. Replace the SIM card.
20. Replace the battery.
21. Follow the procedures in After Working Inside Your Computer.

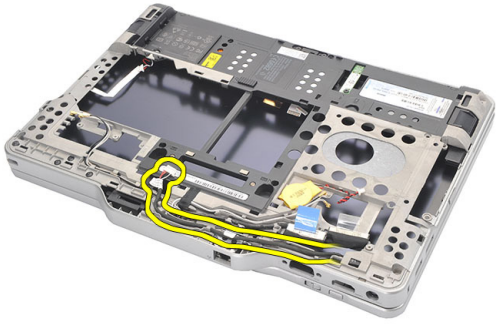
27

Power Connector

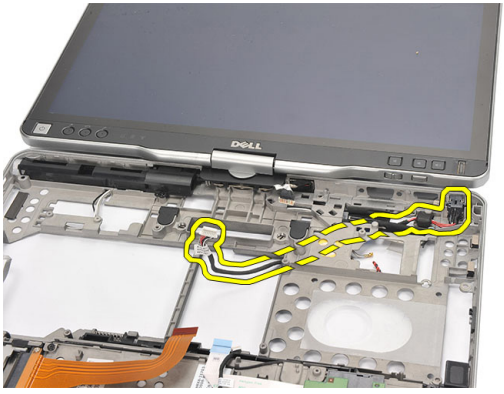
Removing the Power Connector

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the SIM card.
4. Remove the SD card.
5. Remove the back panel.
6. Remove the keyboard trim.
7. Remove the hard drive assembly
8. Remove the memory.
9. Remove the WLAN card.
10. Remove the WWAN card.
11. Remove the base cover.
12. Remove the heat sink.
13. Remove the processor.
14. Remove the WLAN switch board.
15. Remove the palmrest.
16. Remove the system board.

17. Unthread the power connector cable from the routing channel.



18. Lift and remove the power connector from the computer.



Installing the Power Connector

1. Route the power connector cables and insert the power connector in the slot.
2. Replace the system board.
3. Replace the palmrest.
4. Replace the WLAN switch board.
5. Replace the processor.
6. Replace the heat sink.
7. Replace the base cover.
8. Replace the WWAN card.
9. Replace the WLAN card.
10. Replace the memory.

11. Replace the hard drive assembly.
12. Replace the keyboard.
13. Replace the keyboard trim.
14. Replace the back panel.
15. Replace the SD card.
16. Replace the SIM card.
17. Replace the battery.
18. Follow the procedures in After Working Inside Your Computer.

29

Display Bezel

Removing the Display Bezel

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Disengage the display bezel from the right edge and remove the top and the bottom bezel.

Installing the Display Bezel

1. Place the display bezel in line with the top cover.
2. Start from the lower corner and press the display bezel until it snaps into place.
3. Replace the battery.
4. Follow the procedures in After Working Inside Your Computer.

29

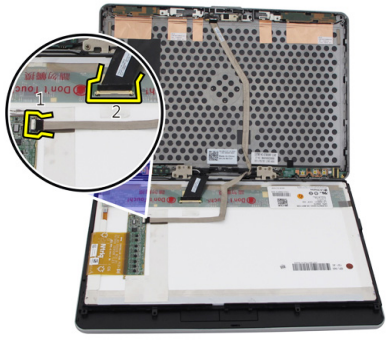
Display Bezel

Removing the Display Panel

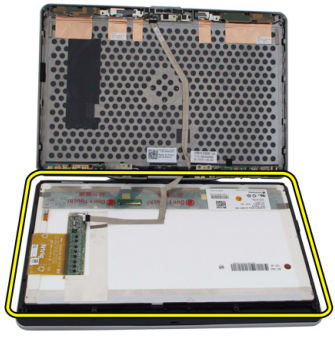
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the display bezel.
4. Remove the screws that secure the display panel.

5. Flip the display panel in the keyboard.

6. Disconnect the LVDS and the touchscreen cables from the back of the display panel.



7. Remove the display panel from the display assembly.



Installing the Display Panel

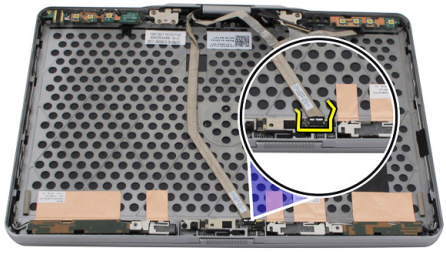
1. Place the display panel onto the keyboard.
2. Connect the LVDS and the touchscreen cables to the display panel.
3. Rotate the display panel over the top cover.
4. Tighten the screws to secure the display panel.
5. Replace the display bezel.
6. Replace the battery.
7. Follow the procedures in After Working Inside Your Computer.

30

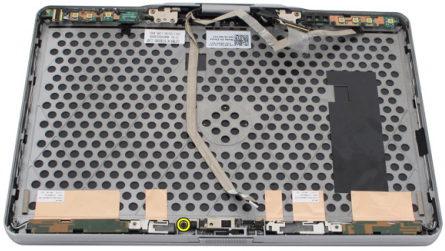
Camera

Removing the Camera

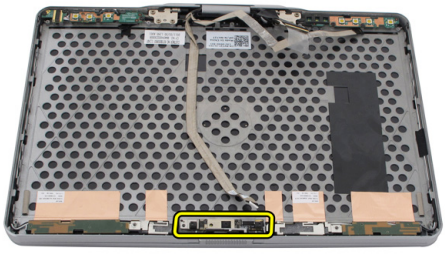
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the display bezel.
4. Remove the display panel.
5. Disconnect the cable from the camera module



6. Remove the screw that secures the camera.



7. Lift the camera module to remove it.



Installing the Camera

1. Place the camera on the top edge of the display back cover.
2. Tighten the screw to secure the camera.
3. Connect the cable to the camera.
4. Replace the display panel.
5. Replace the display bezel.
6. Replace the battery.
7. Follow the procedures in After Working Inside Your Computer.

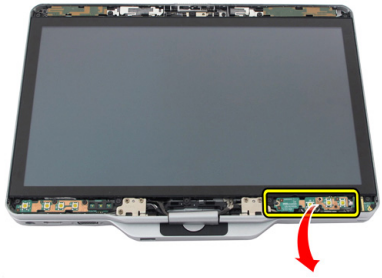
31 Display Function Board and Cable

Removing the Display Function Board

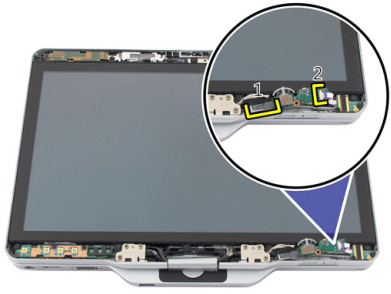
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the display bezel.

   NOTE: Removal of the top bezel is not required.
4. Remove the screws that secure the display function board.

5. Flip the display function board.



6. Disconnect the power and the fingerprint cables.



7. Remove the display function board.

Installing the Display Function Board

1. Connect the display power and the fingerprint cables to the connector.
2. Attach the display function board to the display assembly.
3. Tighten the screws to secure the display function board.
4. Replace the display bezel.
5. Replace the battery.
6. Follow the procedures in After Working Inside Your Computer.

32

Display Power Board

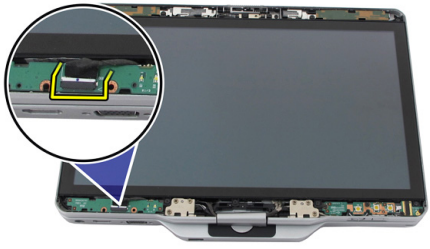
Removing the Display Power Board

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the display bezel.

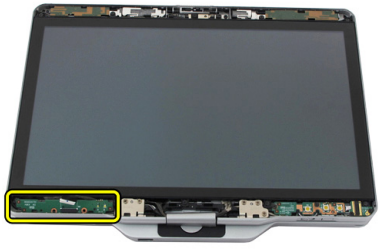
   NOTE: Removal of the top bezel is not required.
4. Remove the screws that secure the display power board.

5. Flip the power board.

6. Disconnect the cable from the display power board.



7. Remove the display power board.



Installing the Display Power Board

1. Connect the display power cable to the connector.
2. Attach the display power board to the display assembly.
3. Tighten the screws to secure the display power board.
4. Replace the display bezel.
5. Replace the battery.
6. Follow the procedures in After Working Inside Your Computer.

33

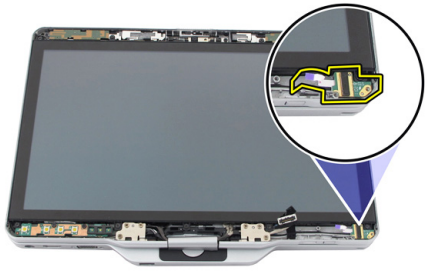
Fingerprint Board

Removing the Display Fingerprint Board and Cable

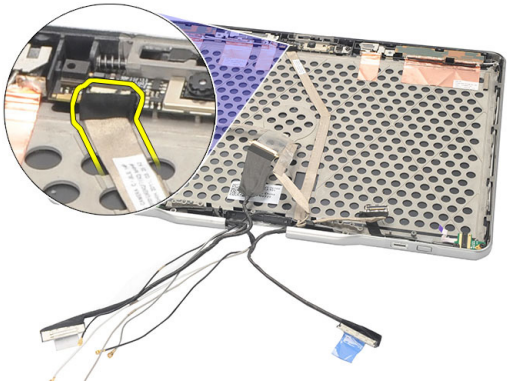
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the display bezel.

   NOTE: Removal of the top bezel is not required.
4. Remove the display function board.
5. Remove the screws that secure the fingerprint board.

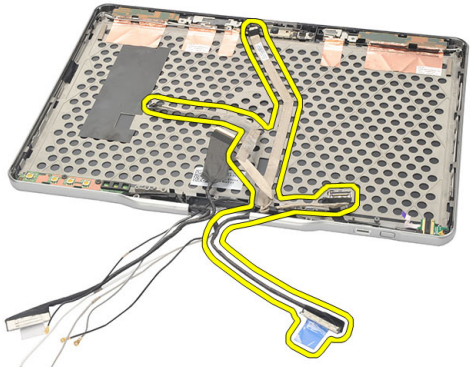
6. Lift the fingerprint board to remove it.



7. To remove the fingerprint board cable, remove the hinge assembly.
8. Disconnect the camera cable from the camera module.



9. Remove the display fingerprint board cable from the display back cover.



Installing the Display Fingerprint Board and Cable

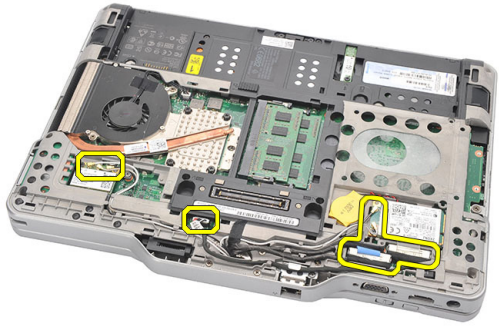
1. Attach the display function board cable to the display back cover.
2. Attach the fingerprint board to the display assembly.
3. Tighten the screws to secure the fingerprint board.
4. Replace the display function board.
5. Replace the display bezel.
6. Replace the battery.
7. Follow the procedures in After Working Inside Your Computer.

34

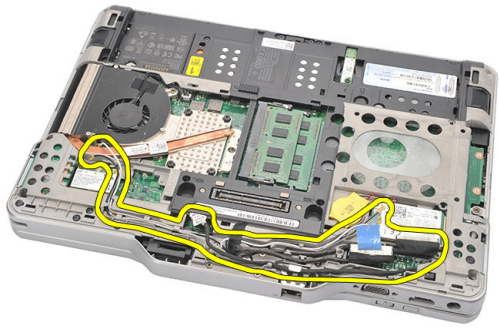
Display Assembly

Removing the Display Assembly

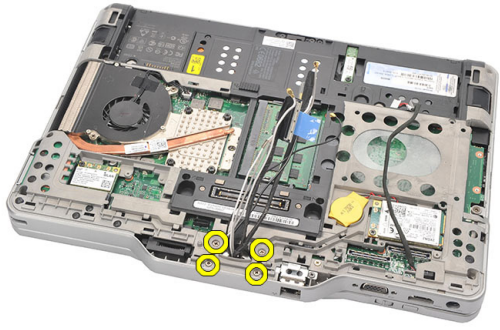
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the hard drive.
5. Remove the base cover.
6. Disconnect the following cables from the bottom of the computer:
   - WWAN
   - WLAN
   - Power connector
   - LVDS
   - function board



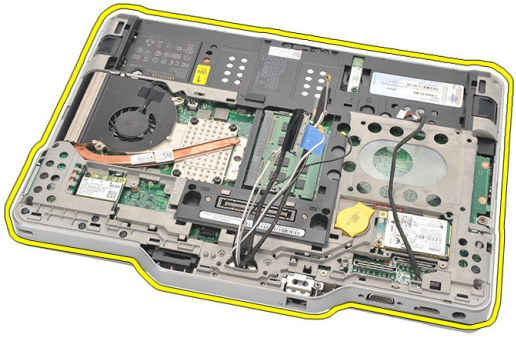
7. Unthread all the cables from the routing channels.



8. Remove the screws that secure the display assembly



9. Lift the bottom base of the computer to separate it from the display assembly.



Installing the Display Assembly

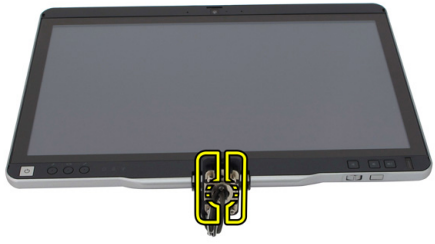
1. Attach the display assembly to the computer.
2. Thread the WLAN, WWAN, LVDS, and function board cables through the hole on the computer.
3. Tighten the screws to secure the display assembly.
4. Replace the back panel.
5. Replace the hard drive.
6. Replace the base cover.
7. Replace the battery.
8. Follow the procedures in After Working Inside Your Computer.

35

Display Hinges

Removing the Display Hinge Assembly

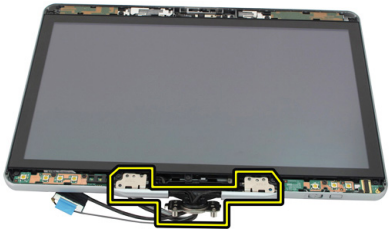
1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the hard drive.
5. Remove the base cover.
6. Remove the display assembly.
7. Remove the display hinge cover from display hinge.



8. Remove the display hinge cap from the display hinge.

9. To remove the display hinges, remove display bezel.
10. Remove the screws that secure the display hinges.

11. Remove the display hinges from the display back cover.



Installing the Display Hinge Assembly

1. Attach the display hinges to the display back cover.
2. Tighten the screws to secure the display hinges.
3. Attach the display hinge cap to the display hinges.
4. Attach the display hinge cover to the display hinges
5. Replace the display bezel.
6. Replace the display assembly.
7. Replace the back cover.
8. Replace the hard drive.
9. Replace the back panel.
10. Replace the battery.
11. Follow the procedures in After Working Inside Your Computer.

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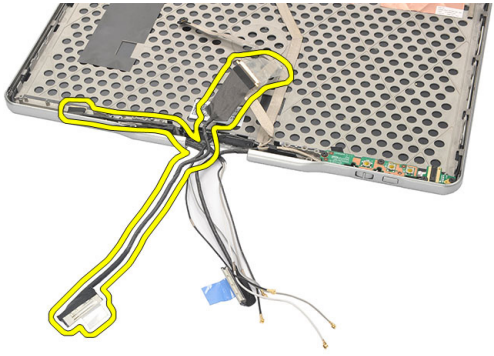
Low-Voltage Differential Signaling (LVDS) Camera Cable

Removing the LVDS Camera Cable

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the back panel.
4. Remove the hard drive.
5. Remove the base cover.
6. Remove the display assembly.
7. Remove the hinge assembly.
8. Remove the LVDS cable from the display back cover.



Installing the LVDS Cable

1. Attach the LVDS cable to the display back cover.
2. Replace the hinge assembly.
3. Replace the display bezel.

4. Replace the display assembly.
5. Replace the base cover.
6. Replace the hard drive.
7. Replace the back panel.
8. Replace the battery.
9. Follow the procedures in After Working Inside Your Computer.

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Specifications

Specifications

NOTE: Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For comprehensive specification of your computer go to **Specifications'** section in your **Owner's Manual** available on the support site at **dell.com/support**. For more information about the configuration of your computer, go to **Help and Support** in your Windows operating system and select the option to view information about your computer.

System Information	
Chipset	Intel Mobile QM67 chipset
DRAM bus width	64 Bits
Flash EPROM	2 MB + 8 MB
PCIe Gen1 bus	PCH provide up to 8 ports

Processor	
Type	• Intel Core i3 series • Intel Core i5 series • Intel Core i7 series

Video	
Type	Intel HD Graphics 3000
Data bus	integrated video
Controller	Intel UMA
Memory	up to 1692 MB shared video
Output	VGA, HDMI, DVI via HDMI/DVI cable (Optional)

Memory	
Memory connector	two SODIMM slots
Memory capacity	1 GB, 2 GB, and 4 GB
Memory type	DDR3 1333 MHz
Minimum memory	2 GB
Maximum memory	up to 8 GB

Audio	
Type	HD audio
Controller	IDT 92HD90
Stereo Conversion	Stereo Conversion 24-Bit (analog-to-digital and digital-to-analog)
Interface:	
Internal	High-definition audio bus
External	microphone-in/stereo headphones/external speakers
Speakers	Rated Power / Peak Power: 2X0.5 Wrms / 2X0.7 Wpeak
Internal speaker amplifier	1 watt per channel, 4 ohms
Volume controls	media buttons for media control

Communicaions	
Network adapter	Type Intel 82579LM Gigabit Ethernet Controller, 10/100/1000 Mbps
Wireless	internal WLAN and WWAN

Ports and Connectors	
Audio	combo connector for microphone / headphone
Video	One 15-pin VGA port
Network adapter	One RJ-45 connector
USB	• two 4–pin USB 2.0–compliant connector

Ports and Connectors	
	• one eSATA/USB 2.0–compliant connector
Memory card reader	smart card/SD card/ExpressCard
IEEE 1394	4-pin connector
HDMI	19–pin connector

Display	
Type	HD WLED
Brightness	198 nits, 306 nits
Size	13.30 inches
Active area (X/Y)	293.42 mm (H) x 164.97 mm (V)
Dimensions:	307.60 mm (H) x 183.10 mm (V)
Height	307.60 ± 0.50 mm
Width	183.10 ± 0.50 mm
Z-Height (max)	5.50 mm
Diagonal	13.30 inches
Maximum resolution	1366 x 768
Operating angle	
Laptop mode	5° to 180°
Tablet mode	0° (closed) to 180°
Refresh rate	60 Hz
Minimum Viewing angles:	
Horizontal	60/60 degrees
Vertical	50/50 degrees
Pixel pitch	0.2148 mm × 0.2148 mm

Keyboard	
Number of keys	• United States and Canada : 83 • Europe: 84

Keyboard	
	• Japan: 87
Layout	QWERTY / AZERTY / Kanji

Touchpad	
X/Y position resolution (graphics table mode)	600 dpi
Size:	
Width	80 mm
Height	40 mm

Battery		
Type	44 Whr lithium ion	76 Whr lithium ion
Dimensions:		
Depth	266 mm (10.50 inches)	286.30 mm (11.27 inches)
Height	13.10 mm (0.51 inch)	22.80 mm (0.90 inch)
Width	70.00 mm (2.75 inches)	95.10 mm (3.74 inches)
Weight	302.00 g (0.66 lb)	486.00 g (1.07 lb)
Voltage	11.1 VDC	
Charge time (approximate)	1 hour to 80% capacity and 2 hours to 100% capacity	5 hours to 100% capacity
Battery Shelf Life (approximate)	Storage from 40% Relative State of Charge (RSOC) to 5% for 6 months at 25 ℃.	
Temperature range:		
Operating	0 °C to 60 °C (32 °F to 140 °F)	
	NOTE: The battery slice will not start to charge if the temperature is above 50° C (122° F).	
Non-operating	–20 °C to 60 °C (–4 °F to 140 °F)	
Coin-cell battery	3 V CR2032 lithium ion	

Camera	
Camera and Microphone	1 Megapixel HD with array Microphone (Optional)
Maximum Resolution	1200 x 800 pixels

Stylus	
Pen Type	electronic, battery powered
Pen Weight	20.0 ± 2.0 Grms
Pen Length	131.6 ± 1.0 mm
Battery Type	AAAA, replaceable
Pen Battery Lifetime	18 months on typical usage
Functions	hover, tip, one\two side switch

AC Adapter		
Input voltage	100 VAC to 240 VAC	
Input current (maximum)	1.50 A	1.60 A
Input frequency	50 Hz to 60 Hz	
Output power	65 W	90 W
Output current	I rated (A) = 3.34 A, I (A) = 3.11 A	I rated (A) = 4.62 A, I(A) = 4.12 A
Rated output voltage	19.50 VDC	
Dimensions:		
Height	27.94 mm (1.10 inches)	33.02 mm (1.30 inches)
Width	48.26 mm (1.90 inches)	50.80 mm (2.00 inches)
Depth	109.22 mm (4.30 inches)	127 mm (5.00 inches)
Temperature range:		
Operating	0 °C to 40 °C (32 °F to 104 °F)	
Non Operating	-40 °C to 70 °C (-40 °F to 158 °F)	

Physical	
Height	
with a WLED panel	30.90 mm (1.22 inches)
Width	323.00 mm (12.72 inches)
Depth	221.70 mm (8.73 inches)
Weight (Minimum)	1.98 kg (4.38 lb) (with 6-cell battery and lightweight solid state drive)

Expansion Bus	
Bus type	two USB 2.0 and one USB2.0/e-SATA
Bus speed	480 MHz

Express Card	
Controller	PCH Controller
Cards Supported	supports one 34 mm ExpressCard, 1.5 V and 3.3 V 28–pin connector size

Smart Card	
Read/write capabilities	supports ISO-7816-3 (asynchronous and synchronous Type I and II), ISO7816-12
Cards supported	1.80 V, 3 V, and 5 V
Program technology supported	JAVA cards
Interface speed	9600 BPS to 115,200 BPS
EMV level	level 1 certified
WHQL certification	PC/SC

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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.

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.

Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL logo is displayed, you must watch for the F2 prompt to appear.
3. Once the F2 prompt appears, press <F2> immediately.

   NOTE: The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it to display, and then press <F2> . If you press <F2> before you are prompted, this keystroke will be lost.
4. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, shut down your computer and try again.

System Setup Options

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

General	
System Information	This section lists the primary hardware features of your computer. • System Information • Memory Information • Processor Information • Device Information
Battery Information	Displays the battery status and the type of AC adapter connected to the computer
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. • Diskette Drive • Internal HDD • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC
Boot List Option	Allows you to change the boot list option. • Legacy • UEFI
Date/Time	Allows you to change the date and time.

System Configuration	
Integrated NIC	Allows you to configure the integrated network controller. The options are: • Disabled • Enabled • Enabled w/PXE (Default Setting) • Enabled w/ImageServer
Serial Port	Identifies and defines the serial port settings. You can set the serial port to: • Disabled • Auto

	• COM1 (Default Setting) • COM2 • COM3 • COM4 **NOTE:** The operating system may allocate resources even if the setting is disabled.
Parallel Port	Allows you to configure the parallel port on the docking station. The options are: • Disabled • AT (Default Setting) • PS2 • ECP • DMA1 • DMA3
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • ATA • AHCI (Default Setting) **NOTE:** SATA is configured to support RAID mode.
Drives	Allows you to configure the SATA drives on board. The options are: • SATA-0 • SATA-1 • SATA-4 • SATA-5 Default Setting: All drives are enabled.
USB Configuration	Allows you to control the USB controller. The options are: • Enable USB Controller (Default Setting) • Diasabe USB Mass Storage Dev

System Configuration	
	• Disable USB Controller (Default Setting)
Keyboard illumination	Allows you to configure the keyboard illumination feature. The options are: • Disabled (Default Setting) • Level is 25% • Level is 50% • Level is 50% • Levels is 100%
Miscellaneous Devices	Allows you to enable or disable the following devices: • Internal Modem • Microphone • Camera • ExpressCard • eSATA ports • Hard Drive Free Fall Protection You can also enable or disable Media Card and 1394 together. Default Setting: All devices are enabled.

Video	
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.

Security	
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. **NOTE:** Successful password changes take effect immediately.

Security	
	NOTE: 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-0 Password	Allows you to set or change the system's internal hard-disk drive. **NOTE:** Successful password changes take effect immediately. 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.
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 (Default Setting) • Reboot bypass
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 not selected
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set.

Security	
	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 (Default Setting) • Disable • Activate **NOTE:** The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. Default Setting: **Enable CPU XD Support**
OROM Keyboard Access	Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are: • Enable (Default Setting) • One Time Enable • Disable
Signed Firmware Update	Allows you to verify if the firmware updates are digitally signed. Default Setting: **Disabled**
Admin Setup Lockout	Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: **Disabled**

Performance	
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

Performance	
	default. Allows you to enable or disable multi-core support for the processor. The options are: • All (Default Setting) • 1 • 2
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 options **C states, C3, C6, Enhanced C-states** and **C7** options are enabled.
Limit CPUID	Allows you to limit the maximum value the processor Standard CPUID Function will support. Default Setting: **Enable CPUID**
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**

Power Management	
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 Setting) • Every Day • Weekdays
USB Wake Support	Allows you to enable USB devices to wake the system from Standby.

Power Management	
	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.
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. Default Setting: **Disabled**
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. Default Setting: **Disabled**
ExpressCharge	Allows you to enable or disable the ExpressCharge feature. The options are: • Standard (Default Setting) • ExpressCharge
Charger Behavior	Allows you to enable or disable the battery charger. The options are; • Disabled • Enabled (Default Setting)

POST Behavior	
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**
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 Default Setting: **Touchpad/Mouse 2**

POST Behavior	
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Default Setting: **Enable Network**
USB Emulation	Allows you to enable or disable the Legacy USB Emulation. Default Setting: **Enable Legacy USB Emulation** is selected.
Fn Key Emulation	Allows you to set the option where the <Scroll Lock> key is used to simulate the <Fn> key feature. Default Setting: **Enable Fn Key Emulation**
POST HotKeys	Allows you enable the sign-on screen message display indicating the keystroke sequence to access the System Setup option menu. Default Setting: **Enable F12 Boot Option Menu**
Fastboot	Allows to set the option to speed up the boot process. The options are: • Minimal • Thorough • Auto Default Setting: **Thorough**

Virtualization Support	
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Default Setting: **Enable Intel Virtualization Technology**
VT for Direct I/O	Allows you to specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel® Virtualization Technology for Direct I/O. Default Setting: **Disabled**
Trusted Execution	Allows you to specify whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel® Trusted Execution Technology. Default Setting: **Disabled**

Wireless	
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: • WWAN • WLAN • Bluetooth Default Setting: All the options are selected.
Wireless Device Enable	Allows you to enable or disable the wireless devices.

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

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Contacting Dell

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.