Notes, cautions, and warnings

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

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

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.
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Before working inside your computer

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Before you begin

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start → Power → Shut down**.
   
   **NOTE**: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.
3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
5. Remove any media card and optical disc from your computer, if applicable.

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and ensure your personal safety.

**WARNING**: Before working inside your computer, read the safety information that shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at [www.dell.com/regulatory_compliance](http://www.dell.com/regulatory_compliance).

**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 electrical outlet.

**CAUTION**: To avoid damaging the computer, ensure that the work surface is flat and clean.
CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching pins and contacts.

CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that shipped with the product or at www.dell.com/regulatory_compliance.

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.

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 or thumb-screws that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending any connector pins. When connecting cables, ensure that the ports and connectors are correctly oriented and aligned.

CAUTION: Press and eject any installed card from the media-card reader.

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #1
- Plastic scribe
The following table provides the list of screws that are used for securing different components to the palm-rest assembly.

**Table 1. Screw list**

<table>
<thead>
<tr>
<th>Component</th>
<th>Secured to</th>
<th>Screw type</th>
<th>Quantity</th>
<th>Screw image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical-drive assembly</td>
<td>Base cover</td>
<td>M2x5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Optical-drive bracket</td>
<td>Optical drive</td>
<td>M2x3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Base cover</td>
<td>Palm-rest assembly</td>
<td>M2.5x8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Base cover</td>
<td>Palm-rest assembly</td>
<td>M2x5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Base cover</td>
<td>Palm-rest assembly</td>
<td>M2x2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Base cover</td>
<td>Palm-rest assembly</td>
<td>M2x5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Hard-drive assembly</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Hard-drive bracket</td>
<td>Hard drive</td>
<td>M3x3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Wireless-card bracket</td>
<td>System board</td>
<td>M2x3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Display hinge</td>
<td>Palm-rest assembly</td>
<td>M2.5x8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Power-button board</td>
<td>Palm-rest assembly</td>
<td>M2x2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Secured to</td>
<td>Screw type</td>
<td>Quantity</td>
<td>Screw image</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------------</td>
<td>------------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>I/O board</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>1</td>
<td><img src="image_url" alt="Screw Image" /></td>
</tr>
<tr>
<td>Fan</td>
<td>System board</td>
<td>M2x5</td>
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<td><img src="image_url" alt="Screw Image" /></td>
</tr>
<tr>
<td>System board</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>2</td>
<td><img src="image_url" alt="Screw Image" /></td>
</tr>
<tr>
<td>Touch-pad bracket</td>
<td>Touch pad</td>
<td>M2x3</td>
<td>6</td>
<td><img src="image_url" alt="Screw Image" /></td>
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<tr>
<td>Power-adapter port</td>
<td>Palm-rest assembly</td>
<td>M2x3</td>
<td>1</td>
<td><img src="image_url" alt="Screw Image" /></td>
</tr>
<tr>
<td>Display panel</td>
<td>Display back-cover and antenna assembly</td>
<td>M2x3</td>
<td>4</td>
<td><img src="image_url" alt="Screw Image" /></td>
</tr>
<tr>
<td>Display hinges</td>
<td>Display back-cover and antenna assembly</td>
<td>M2.5xM2.5 big head</td>
<td>6</td>
<td><img src="image_url" alt="Screw Image" /></td>
</tr>
</tbody>
</table>
After working inside your computer

⚠️ **CAUTION:** Leaving stray or loose screws inside your computer may severely damage your computer.

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.
Removing the battery

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Slide the battery-release latch to the unlocked position. You hear a click sound when the battery is unlocked.

2. Using your fingertips, lift the battery at an angle and remove it from the battery bay.
3 Turn the computer over, open the display, and press the power button for five seconds to ground the system board.
Replacing the battery

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Close the display and turn the computer over.
2. Place the battery in the battery bay and snap the battery into place.
Removing the optical drive

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

Remove the battery.

Procedure

1. Remove the screw (M2x5) that secures the optical-drive assembly to the base cover.
2. Using a plastic scribe, push to release the optical-drive assembly from the optical-drive bay.
3 Pull the optical-drive assembly out of the optical-drive bay.

4 Remove the screw (M2x3) that secures the optical-drive bracket to the optical drive.

**NOTE:** Note the orientation of the optical-drive bracket so that you can replace it correctly.
5  Remove the optical-drive bracket from the optical drive.

6  Carefully pull the optical-drive bezel and remove it from the optical drive.
Replacing the optical drive

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Procedure

1. Align the tabs on the optical-drive bezel with the slots on the optical drive and snap it into place.
2. Align the screw hole on the optical-drive bracket with the screw hole on the optical-drive assembly.

   NOTE: You must correctly align the optical-drive bracket to ensure that the optical drive can be properly secured to the computer. For correct orientation, see step 4 in "Removing the optical drive".
3. Replace the screw (M2x3) that secures the optical-drive bracket to the optical-drive assembly.
4. Slide the optical-drive assembly into the optical-drive bay and snap it into place.
5. Replace the screw (M2x5) that secures the optical-drive assembly to the computer base.

Post-requisites

Replace the battery.
Removing the keyboard

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Prerequisites

Remove the battery.

Procedure

1. Turn the computer over and open the display as far as possible.
2. Using a plastic scribe, gently release the tabs that secure the keyboard to the palm-rest assembly.
3. Slide the keyboard up to release it from the slots on the palm-rest assembly.
4  Carefully turn the keyboard over and place it on the palm-rest assembly.

5  Open the latch and disconnect the keyboard cable from the system board.
6  Lift the keyboard off the palm-rest assembly.
Replacing the keyboard

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**Procedure**

1. Slide the keyboard cable into the system-board connector and close the latch to secure the cable.
2. Turn the keyboard over, slide the tabs on the keyboard into the slots on the palm-rest assembly, and snap the keyboard into place.

**Post-requisites**

Replace the battery.
Removing the base cover

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**Prerequisites**

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.

**Procedure**

1. Remove the five screws (M2x5) that secure the base cover to the palm-rest assembly.
2 Open the latch, and disconnect the optical-drive cable from the connector on the system board.

3 Close the display and turn the computer over.

4 Remove the eight screws (M2.5x8) that secure the base cover to the palm-rest assembly.

5 Remove the three screws (M2x2) that secure the base cover to the palm-rest assembly.
6  Remove the two screws (M2x5) that secure the base cover to the palm-rest assembly.
7 Using a plastic scribe, pry the base cover off the palm-rest assembly.

8 Turn the base cover over.
9 Remove the optical-drive interposer.
Replacing the base cover

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Replace the optical-drive interposer.
2. Turn the base cover over.
3. Place the base cover on the palm-rest assembly and route the optical-drive cable through the slot on the palm-rest assembly.

4. Slide the tabs on the base cover into the slots on the palm-rest assembly and snap the base cover into place.

5. Slide the optical-drive cable into its connector on the system board and close the latch to secure the cable.

6. Replace the five screws (M2x5) that secure the palm-rest assembly to the base cover.

7. Close the display and turn the computer over.

8. Replace the three screws (M2x2) that secure the base cover to the palm-rest assembly.
9 Replace the two screws (M2x5) that secure the base cover to the palm-rest assembly.

10 Replace the eight screws (M2.5x8) that secure the base cover to the palm-rest assembly.

Post-requisites

1 Replace the keyboard.
2 Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
3 Replace the battery.
Removing the optical-drive interposer

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 8 in “Removing the base cover”.

Procedure

Release the optical-drive interposer from the tabs on the base cover.
Replacing the optical-drive interposer

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

Align the tabs on the base cover and snap it into place.

Post-requisites

1. Follow the procedure from step 2 to step 9 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the hard drive

⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

⚠ CAUTION: Hard drives are fragile. Exercise care when handling the hard drive.

⚠ CAUTION: To avoid data loss, do not remove the hard drive while the computer is in sleep or on state.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

1. Open the latch and disconnect the hard-drive cable from the system board.
2. Remove the four screws (M2x3) that secure the hard-drive assembly to the palm-rest assembly.
3 Lift the hard-drive assembly off the palm-rest assembly.

4 Disconnect the interposer from the hard-drive assembly.

5 Remove the four screws (M3x3) that secure the hard-drive bracket to the hard drive.
Lift the hard drive off the hard-drive bracket.
Replacing the hard drive

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

⚠️ CAUTION: Hard drives are fragile. Exercise care when handling the hard drive.

Procedure

1. Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
2. Replace the four screws (M3x3) that secure the hard-drive bracket to the hard drive.
3. Connect the interposer to the hard drive.
4. Place the hard-drive assembly in the palm-rest assembly and align the screw holes on the hard-drive assembly with the screw holes on the palm-rest assembly.
5. Replace the four screws (M2x3) that secure the hard-drive assembly to the palm-rest assembly.
6. Slide the hard-drive cable into its connector on the system board and close the latch to secure the cable.

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the memory modules

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

1. Using your fingertips, carefully spread apart the securing clips on each end of the memory-module slot until the memory module pops up.
2 Slide and remove the memory module from the memory-module slot.
Replacing the memory modules

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Align the notch on the memory module with the tab on the memory-module slot and slide it firmly into the slot at an angle.
2 Press the memory module down until it clicks into place.

![Image of memory module installation]

**NOTE:** If you do not hear the click, remove the memory module and reinstall it.

---

**Post-requisites**

1 Follow the procedure from step 2 to step 8 in “Replacing the base cover”.  
2 Replace the keyboard.  
3 Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.  
4 Replace the battery.
Removing the wireless card

⚠️ **WARNING**: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in *Before working inside your computer*. After working inside your computer, follow the instructions in *After working inside your computer*. For more safety best practices, see the Regulatory Compliance home page at [www.dell.com/regulatory_compliance](http://www.dell.com/regulatory_compliance).

**Prerequisites**

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

**Procedure**

1. Remove the screw (M2x3) that secures the wireless-card bracket to the wireless card and system board.
2. Remove the wireless-card bracket from the wireless card.
3. Disconnect the antenna cables from the wireless card.
4 Slide and remove the wireless card from the wireless-card slot.
Replacing the wireless card

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

⚠️ CAUTION: To avoid damage to the wireless card, do not place any cables under it.

1. Align the notch on the wireless card with the tab on the wireless-card slot.
2. Slide the wireless card at an angle into the wireless-card slot.
3 Connect the antenna cables to the wireless card.

The following table provides the antenna-cable color scheme for the wireless card supported by your computer:

**Table 2. Antenna-cable color scheme**

<table>
<thead>
<tr>
<th>Connectors on the wireless card</th>
<th>Antenna cable color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary (black triangle)</td>
<td>Black</td>
</tr>
<tr>
<td>Main (white triangle)</td>
<td>White</td>
</tr>
</tbody>
</table>

4 Align the screw hole on the wireless-card bracket with the screw hole on the wireless card and the system board.

5 Replace the screw (M2x3) that secures the wireless-card bracket to the wireless card and system board.

**Post-requisites**

1 Follow the procedure from step 2 to step 8 in “Replacing the base cover”.

2 Replace the [keyboard](#).
3 Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4 Replace the battery.
Removing the power-button board

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**Prerequisites**

1. Remove the **battery**.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the **keyboard**.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

**Procedure**

1. Remove the two screws (M2.5x8) that secure the display hinge to the palm-rest assembly.
2. Open the hinge to an angle of 90 degrees.

3. Open the latch and disconnect the power-button board cable from the system board.

4. Remove the screw (M2x2) that secures the power-button board to the palm-rest assembly.

5. Peel the tape that secures the power-button board to the palm-rest assembly.

6. Slide and remove the power-button board from the tab on the palm-rest assembly.
7 Note the power-button board cable routing and peel it off the palm-rest assembly.
Replacing the power-button board

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Procedure

1. Slide the power-button board under the tab on the palm-rest assembly and align the screw hole on the power-button board with the screw hole on the palm-rest assembly.
2. Replace the screw (M2x2) that secures the power-button board to the palm-rest assembly.
3. Adhere the tape that secures the power-button board to the palm-rest assembly.
4. Route the power-button board cable through the slot on the palm-rest assembly.
5. Slide the power-button board cable into its connector on the system board and close the latch to secure the cable.
6. Close the display hinges.
7. Align the screw holes on the display hinges with the screw holes on the palm-rest assembly.
8. Replace the two screws (M2.5x8) that secure the display hinges to the palm-rest assembly.

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the speakers

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Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

1. Disconnect the speaker cable from the system board.
2. Peel off the tape that secures the speaker cable to the palm-rest assembly.
3. Note the speaker-cable routing and lift the speakers, along with the speaker cable, off the palm-rest assembly.

**NOTE:** Note the position of the rubber grommets before lifting the speaker.
Replacing the speakers

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Procedure

⚠️ NOTE: The rubber grommets may get pushed out while replacing the speaker. Ensure that the rubber grommets are in their position after placing the speaker on the system board.

1. Align the speakers using the alignment posts on the palm-rest assembly and snap the speakers into place.
2. Route the speaker cable through the routing guides on the palm-rest assembly.
3. Connect the speaker cable to the system board.
4. Adhere the tape that secures the speaker cable to the palm-rest assembly.

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the I/O board

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Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

1. Open the latch and disconnect the I/O-board cable from the I/O board.
2. Remove the screw (M2x3) that secures the I/O board to the palm-rest assembly.
3. Push the securing tab to release the I/O board from the palm-rest assembly.
4 Lift the I/O board off the palm-rest assembly.
Replacing the I/O board

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Procedure

1. Using the alignment posts, place the I/O board on the palm-rest assembly and snap the I/O board into place.
2. Slide the I/O-board cable into its connector on the I/O board and close the latch to secure the cable.
3. Replace the screw (M2x3) that secures the I/O board to the palm-rest assembly.

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the coin-cell battery

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⚠️ CAUTION: Removing the coin-cell battery resets the BIOS setup program’s settings to default. It is recommended that you note the BIOS setup program’s settings before removing the coin-cell battery.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

Using a plastic scribe, gently pry the coin-cell battery out of the battery socket.
Replacing the coin-cell battery

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Procedure

With the positive-side facing up, snap the coin-cell battery into the battery socket.

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the heat sink

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⚠️ WARNING: The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

⚠️ CAUTION: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

1. Remove the captive screws that secure the heat sink to the system board.
2 Lift the heat sink off the system board.

**Integrated:** Eight screws

**Discrete:** Four screws
Replacing the heat sink

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

⚠️ CAUTION: Incorrect alignment of the heat sink can damage the system board and processor.

🔥 NOTE: The original thermal grease can be reused if the original system board and heat sink are reinstalled together. If either the system board or the heat sink is replaced, use the thermal pad provided in the kit to ensure that thermal conductivity is achieved.

Procedure

1. Align the screws on the heat sink with the screw holes on the system board.
2. Replace the captive screws that secure the heat sink to the system board.
   - Integrated: Eight screws
   - Discrete: Four screws

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the fan

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Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

1. Disconnect the fan cable from the system board.
2. Remove the two screws (M2x5) that secure the fan to the palm-rest assembly.
3 Lift the fan off the palm-rest assembly.
Replacing the fan

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Procedure

1. Place the fan on the palm-rest assembly.
2. Align the screw holes on the fan with the screw holes on the palm-rest assembly.
3. Replace the two screws (M2x5) that secure the fan to the system board.
4. Connect the fan cable to the system board.

Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.
Removing the status-light lens

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.

Procedure

Remove the status-light lens from the guide on the palm-rest assembly.
Replacing the status-light lens

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Post-requisites

1. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
2. Replace the keyboard.
3. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
4. Replace the battery.

Procedure

Align the status-light lens with the guide on the palm-rest assembly.
Removing the system board

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NOTE: Your computer’s Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

NOTE: Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the wireless card.
6. Remove the memory modules.
7. Remove the heat sink.
8. Remove the fan.
Procedure

1. Remove the screw (2.5x8) that secure the display hinge to the palm-rest assembly.

   **NOTE:** These instructions are applicable only for laptops with a non-touch screen display.

2. Open the hinge to an angle of 90 degrees.

3. Peel the tape that secures the display cable to the system board.
4. Open the latch and disconnect the display cable from the system board.
5. Open the latch and disconnect the power-button board cable from the system board.
6. Open the latch and disconnect the hard-drive cable from the system board.
7. Open the latch and disconnect the I/O-board cable from the system board.
8. Disconnect the speaker cable from the system board.
9. Open the latch and disconnect the touch-pad cable from the system board.

10. Remove the two screws (M2x3) that secures the system board to the palm-rest assembly.

11. Gently release the ports on the system board from the slots on the palm-rest assembly.
12 Carefully turn the system board over.

13 Peel the tape that secures the power-adapter port cable to the system board and disconnect the power-adapter port from the system board.
Lift the system board off the palm-rest assembly.
Replacing the system board

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NOTE: Your computer’s Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Procedure

1. Connect the power-adapter port cable to the system board.
2. Adhere the tape that secures the power-adapter port cable to the system board.
3. Turn the system board over.
4. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
5. Replace the two screws (M2x3) that secures the system board to the palm-rest assembly.
6. Connect the touch-pad cable and close the latch to secure the cable.
7. Connect the speaker cable to the system board.
8. Connect the I/O-board cable and close the latch to secure the cable.
9. Connect the hard-drive cable and close the latch to secure the cable.
10. Connect the power-button board cable and close the latch to secure the cable.
11. Connect the display cable and close the latch to secure the cable.
12. Adhere the tape that secures the display cable to the system board.
13. Close the display hinges.
14 Align the screw holes on the display hinges with the screw holes on the palm-rest assembly.

**NOTE:** These instructions are applicable only for laptops with a non-touch screen display.

15 Replace the screw (2.5x8) that secure the display hinges to the palm-rest assembly.

**Post-requisites**

1 Replace the fan.
2 Replace the heat sink.
3 Replace the memory modules.
4 Replace the wireless card.
5 Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
6 Replace the keyboard.
7 Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
8 Replace the battery.
Removing the touchpad

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Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the memory modules.
6. Remove the wireless card.
7. Remove the heat sink.
8. Remove the fan.
9. Remove the system board.

Procedure

1. Peel the tape that secures the touch-pad bracket to the palm-rest assembly.
2. Remove the six screws (M2x3) that secure the touch-pad bracket to the touch pad.
3 Lift the touch-pad bracket off the palm-rest assembly.
4 Lift the touch pad off the palm-rest assembly.
Replacing the touchpad

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Procedure

1. Place the touch pad on the palm-rest assembly.
2. Align the screw holes on the touch-pad bracket with the screw holes on the palm-rest assembly.
3. Replace the six screws (M2x3) that secure the touch-pad bracket to the touch pad.
4. Adhere the tape that secures the touch-pad bracket to the palm-rest assembly.

Post-requisites

1. Replace the system board.
2. Replace the fan.
3. Replace the heat sink.
4. Replace the wireless card.
5. Replace the memory modules.
6. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
7. Replace the keyboard.
8. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
9. Replace the battery.
Removing the power-adapter port

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Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the coin-cell battery.
6. Remove the memory modules.
7. Remove the wireless card.
8. Remove the heat sink.
9. Remove the fan.
10. Remove the system board.

Procedure

1. Remove the screw (M2x3) that secures the power-adapter port to the palm-rest assembly.
2. Note the power-adapter port cable routing and remove the cable from its routing guides.
3 Lift the power-adapter port off the palm-rest assembly.
Replacing the power-adapter port

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Procedure

1. Slide the power-adapter port into the slot on the palm-rest assembly.
2. Replace the screw (M2x3) that secures the power-adapter port to the palm-rest assembly.
3. Route the power-adapter port cable along its routing guides on the palm-rest assembly.

Post-requisites

1. Replace the system board.
2. Replace the fan.
3. Replace the heat sink.
4. Replace the wireless card.
5. Replace the memory modules.
6. Replace the coin-cell battery.
7. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
8. Replace the keyboard.
9. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
10. Replace the battery.
Removing the display assembly

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Prerequisites

1. Remove the **battery**.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the **keyboard**.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the **wireless card**.

Procedure

1. Remove the three screws (2.5x8) that secure the display hinges to the palm-rest assembly.
2 Open the display hinges to an angle of 90 degrees.

3 Peel the tape that secures the display cable to the palm-rest assembly.
4 Open the latch and disconnect the display cable.
5 Note the display cable routing and remove the display cable from the routing guides on the palm-rest assembly.
6 Note the antenna cable routing and remove the cable from its routing guides on the palm-rest assembly.
7 Open the palm-rest assembly at an angle and slide it off the display assembly.
Replacing the display assembly

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Procedure

1. Place the display assembly on a clean, flat surface.
2. Place the palm-rest assembly on the display assembly.
3. Close the display hinges and align the screw holes on the display hinges with the screw holes on the palm-rest assembly.
4. Replace the three screws (2.5x8) that secure the display hinges to the palm-rest assembly.
5. Route the antenna cables through the routing guides on the palm-rest assembly.
6. Connect the display cable and close the latch to secure the cable.
7. Route the display cable through the routing guides on the palm-rest assembly.
8. Adhere the tape that secures the display cable to the palm-rest assembly.
9. Close the display and turn the computer over.

Post-requisites

1. Replace the wireless card.
2. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
3. Replace the keyboard.
4. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
5. Replace the battery.
Removing the display bezel

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

NOTE: These instructions are applicable only for laptops with a non-touch screen display.

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the wireless card.
6. Remove the display assembly.
Procedure

1  Using your fingertips, carefully pry up the inner edges of the display bezel.

2  Remove the display bezel off the display back-cover and antenna assembly.
Replacing the display bezel

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Procedure

Align the display bezel with the display back-cover and gently snap the display bezel into place.

Post-requisites

1. Replace the display assembly.
2. Replace the wireless card.
3. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
4. Replace the keyboard.
5. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
6. Replace the battery.
Removing the display panel

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Prerequisites

NOTE: These instructions are applicable only for laptops with a non-touch screen display.

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in "Removing the optical drive".
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in "Removing the base cover".
5. Remove the wireless card.
6. Remove the display assembly.
7. Remove the display bezel.

Procedure

1. Remove the four screws (M2x3) that secure the display panel to the display back-cover and antenna assembly.
2. Lift the display panel and turn it over.

3. Peel the tape that secures the display cable to the display panel.

4. Open the latch and disconnect the display cable from the display panel.
5 Lift the display panel off the display back-cover and antenna assembly.
Replacing the display panel

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Post-requisites

1. Replace the display bezel.
2. Replace the display assembly.
3. Replace the wireless card.
4. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
5. Replace the keyboard.
6. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
7. Replace the battery.

Procedure

1. Slide the display cable into the connector on the display panel and close the latch to secure the cable.
2. Adhere the tape that secures the display cable to the display panel.
3. Turn the display panel over and place it on the display back-cover and antenna assembly.
4. Align the screw holes on the display panel with the screw holes on the display back-cover and antenna assembly.
5. Replace the four screws (M2x3) that secure the display panel to the display back-cover and antenna assembly.
Removing the camera

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

NOTE: These instructions are applicable only for laptops with a non-touchscreen display.

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the wireless card.
6. Remove the display assembly.
7. Remove the display bezel.

Procedure

1. Using a plastic scribe, gently pry the camera and lift it at an angle.
2. Disconnect the camera cable from the camera.
3 Lift the camera off the display back-cover and antenna assembly.
Replacing the camera

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Using the alignment post, adhere the camera on the display back-cover and antenna assembly.
2. Connect the camera cable to the camera.

Post-requisites

1. Replace the display bezel.
2. Replace the display assembly.
3. Replace the wireless card.
4. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
5. Replace the keyboard.
6. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
7. Replace the battery.
Removing the display hinges

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

NOTE: These instructions are applicable only for laptops with a non-touchscreen display.

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the wireless card.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

Procedure

1. Remove the six screws (M2.5x2.5 big head) that secure the display hinges to the display back-cover and antenna assembly.
2 Carefully lift the display hinges off the display back-cover and antenna assembly.
Replacing the display hinges

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Post-requisites

1. Replace the display panel.
2. Replace the display bezel.
3. Replace the display assembly.
4. Replace the wireless card.
5. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
6. Replace the keyboard.
7. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
8. Replace the battery.

Procedure

1. Align the screw holes on the display hinges with the screw holes on the display back-cover and antenna assembly.
2. Replace the six screws (M2.5x2.5 big head) that secure the display hinges to the display back-cover and antenna assembly.
Removing the display back-cover and antenna assembly

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in Removing the optical drive.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Remove the wireless card.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.
9. Remove the display hinges.
10. Remove the camera.

Procedure

⚠️ NOTE: These instructions are applicable only for laptops with a non-touch screen display.

After performing the steps mentioned in the prerequisites, we are left with the display back-cover and antenna assembly.
Replacing the display back-cover and antenna assembly

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

Place the display back-cover and antenna assembly on a clean, flat surface.

Post-requisites

1. Replace the camera.
2. Replace the display hinges.
3. Replace the display panel.
4. Replace the display bezel.
5. Replace the display assembly.
6. Replace the wireless card.
7. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
8. Replace the keyboard.
9. Follow the procedure from step 4 to step 5 in “Replacing the optical drive.
10. Replace the battery.
Removing the palm rest

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the battery.
2. Follow the procedure from step 1 to step 3 in “Removing the optical drive”.
3. Remove the keyboard.
4. Follow the procedure from step 1 to step 7 in “Removing the base cover”.
5. Follow the procedure from step 1 to step 3 in “Removing the hard drive”.
6. Remove the memory modules.
7. Remove the wireless card.
8. Remove the power-button board.
9. Remove the speakers.
10. Remove the I/O board.
11. Remove the heat sink.
12. Remove the fan.
13. Remove the status-light lens.
14. Remove the system board.
15. Remove the touch pad.
16. Remove the power-adapter port.
17. Remove the display assembly.

Procedure

After performing the steps in the prerequisites we are left with the palm rest.
Replacing the palm rest

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Post-requisites

1. Replace the display assembly.
2. Replace the power-adapter port.
3. Replace the touch pad.
4. Replace the system board.
5. Replace the status-light lens.
6. Replace the fan.
7. Replace the heat sink.
8. Replace the I/O board.
9. Replace the speakers.
10. Replace the power-button board.
11. Replace the wireless card.
12. Replace the memory modules.
13. Follow the procedure from step 4 to step 6 in “Replacing the hard drive”.
14. Follow the procedure from step 2 to step 8 in “Replacing the base cover”.
15. Replace the keyboard.
16. Follow the procedure from step 4 to step 5 in “Replacing the optical drive”.
17. Replace the battery.

Procedure

Place the palm rest on a clean and flat surface.
Downloading drivers

Downloading the audio driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click or tap **Product support**, enter the Service Tag of your computer, and then click or tap **Submit**.

   ![NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.]

4. Click or tap **Drivers & downloads → Find it myself**.
5. Scroll down the page and expand **Audio**.
6. Click or tap **Download** to download the audio driver for your computer.
7. After the download is complete, navigate to the folder where you saved the audio driver file.
8. Double-click or double-tap the audio driver file icon and follow the instructions on the screen to install the driver.

Downloading the graphics driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click or tap **Product support** enter the Service Tag of your computer, and then click or tap **Submit**.

   ![NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.]

4. Click or tap **Drivers & downloads → Find it myself**.
5. Scroll down the page and expand **Video**.
6. Click or tap **Download** to download the graphics driver for your computer.
7. After the download is complete, navigate to the folder where you saved the graphics driver file.
8. Double-click or double-tap the graphics driver file icon and follow the instructions on the screen.
Downloading the USB 3.0 driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click or tap Product support enter the Service Tag of your computer, and then click or tap Submit.

   NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click or tap Drivers & downloads → Find it myself.
5. Scroll down the page and expand Chipset.
6. Click or tap Download to download the USB 3.0 driver for your computer.
7. After the download is complete, navigate to the folder where you saved the USB 3.0 driver file.
8. Double-click or double-tap the driver file icon and follow the instructions on screen.

Downloading the Wi-Fi driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click or tap Product support enter the Service Tag of your computer, and then click or tap Submit.

   NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click or tap Drivers & downloads → Find it myself.
5. Scroll down the page and expand Network.
6. Click or tap Download to download the Wi-Fi driver for your computer.
7. After the download is complete, navigate to the folder where you saved the Wi-Fi driver file.
8. Double-click or double-tap the driver file icon and follow the on-screen instructions to install the driver.

Downloading the media-card reader driver

1. Turn on your computer.
2 Go to www.dell.com/support.
3 Click Product support, enter the Service Tag of your computer, and then click Submit.

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

4 Click Drivers & downloads → Find it myself.
5 Scroll down the page, and expand Chipset.
6 Click Download to download the media-card reader driver for your computer.
7 After the download is complete, navigate to the folder where you saved the card reader driver file.
8 Double-click the card reader driver file icon, and follow the instructions on the screen.

Downloading the chipset driver

1 Turn on your computer.
2 Go to www.dell.com/support.
3 Click or tap Product support, enter the Service Tag of your computer, and then click or tap Submit.

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

4 Click or tap Drivers & downloads → Find it myself.
5 Scroll down the page and expand Chipset.
6 Click or tap Download to download the chipset driver for your computer.
7 After the download is complete, navigate to the folder where you saved the chipset driver file.
8 Double-click or double-tap the chipset driver file icon and follow the instructions on the screen.

Downloading the network driver

1 Turn on your computer.
2 Go to www.dell.com/support.
3 Click **Product support** enter the Service Tag of your computer and click **Submit**.

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

4 Click **Drivers & downloads ➔ Find it myself**.

5 Scroll down the page and expand **Network**.

6 Click **Download** to download the network driver for your computer.

7 Save the file, and after the download is complete, navigate to the folder where you saved the network driver file.

8 Double-click the network driver file icon and follow the instructions on screen.
System setup

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

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 (if available)
• SATA Hard Drive (if available)
• Diagnostics

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

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

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.
Keys

Navigation

Up arrow
Moves to the previous field.

Down arrow
Moves to the next field.

Enter
Selects a value in the selected field (if applicable) or follow the link in the field.

Spacebar
Expands or collapses a drop-down list, if applicable.

Tab
Moves to the next focus area.

NOTE: For the standard graphics browser only.

Esc
Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

BIOS overview

⚠️ **CAUTION:** Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Entering BIOS setup program

1. Turn on (or restart) your computer.
During POST, when the DELL logo is displayed, watch for the F2 prompt to appear, and then press F2 immediately.

**NOTE:** The F2 prompt indicates that the keyboard is initialized. This prompt can appear very quickly, so you must watch for it, and then press F2. If you press F2 before the F2 prompt, this keystroke is lost. If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Then, turn off your computer and try again.

### System setup options

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

<table>
<thead>
<tr>
<th>General—System Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Information</strong></td>
</tr>
<tr>
<td>BIOS Version</td>
</tr>
<tr>
<td>Service Tag</td>
</tr>
<tr>
<td>Asset Tag</td>
</tr>
<tr>
<td>Ownership Tag</td>
</tr>
<tr>
<td>Manufacture Date</td>
</tr>
<tr>
<td>Ownership Date</td>
</tr>
<tr>
<td>Express Service Code</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memory Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Installed</td>
</tr>
<tr>
<td>Memory Available</td>
</tr>
<tr>
<td>Memory Speed</td>
</tr>
<tr>
<td>Memory Channel Mode</td>
</tr>
<tr>
<td>Memory Technology</td>
</tr>
<tr>
<td>DIMM A Size</td>
</tr>
<tr>
<td>DIMM B Size</td>
</tr>
</tbody>
</table>
## General-System Information

### Processor Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Type</td>
<td>Displays the processor type.</td>
</tr>
<tr>
<td>Core Count</td>
<td>Displays the number of cores on the processor.</td>
</tr>
<tr>
<td>Processor ID</td>
<td>Displays the processor identification code.</td>
</tr>
<tr>
<td>Current Clock Speed</td>
<td>Displays the current processor clock speed.</td>
</tr>
<tr>
<td>Minimum Clock Speed</td>
<td>Displays the minimum processor clock speed.</td>
</tr>
<tr>
<td>Maximum Clock Speed</td>
<td>Displays the maximum processor clock speed.</td>
</tr>
<tr>
<td>Processor L2 Cache</td>
<td>Displays the processor L2 Cache size.</td>
</tr>
<tr>
<td>Processor L3 Cache</td>
<td>Displays the processor L3 Cache size.</td>
</tr>
<tr>
<td>HT Capable</td>
<td>Displays whether the processor is HyperThreading (HT) capable.</td>
</tr>
<tr>
<td>64-Bit Technology</td>
<td>Displays whether 64-bit technology is used.</td>
</tr>
</tbody>
</table>

### Device Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA-0</td>
<td>Displays the SATA-0 device information of the computer.</td>
</tr>
<tr>
<td>SATA-1</td>
<td>Displays the SATA-1 device information of the computer.</td>
</tr>
<tr>
<td>LOM MAC Address</td>
<td>Displays the LAN On Motherboard (LOM) MAC address of the computer.</td>
</tr>
<tr>
<td>Video Controller</td>
<td>Displays the video controller type of the computer.</td>
</tr>
<tr>
<td>dGPU Video Controller</td>
<td>Displays the discrete graphics information of the computer.</td>
</tr>
<tr>
<td>Video BIOS Version</td>
<td>Displays the video BIOS version of the computer.</td>
</tr>
<tr>
<td>Video Memory</td>
<td>Displays the video memory information of the computer.</td>
</tr>
<tr>
<td>Panel Type</td>
<td>Displays the Panel Type of the computer.</td>
</tr>
<tr>
<td>Native Resolution</td>
<td>Displays the native resolution of the computer.</td>
</tr>
<tr>
<td>Audio Controller</td>
<td>Displays the audio controller information of the computer.</td>
</tr>
</tbody>
</table>
### General-System Information

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wi-Fi Device</td>
<td>Displays the wireless device information of the computer.</td>
</tr>
<tr>
<td>Bluetooth Device</td>
<td>Displays the bluetooth device information of the computer.</td>
</tr>
<tr>
<td>Battery Information</td>
<td>Displays whether bluetooth is installed in the computer.</td>
</tr>
<tr>
<td>Boot Sequence</td>
<td>Displays the boot sequence.</td>
</tr>
<tr>
<td>Boot List Option</td>
<td>Displays the available boot options.</td>
</tr>
</tbody>
</table>

### Advanced Boot Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Legacy Option ROMs</td>
<td>Enable or disable the Legacy Option ROMs.</td>
</tr>
</tbody>
</table>

### Date/Time

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date/Time</td>
<td>Displays the current date in MM/DD/YY format and current time in HH:MM:SS AM/PM format.</td>
</tr>
</tbody>
</table>

### Table 4. System setup options—System Configuration menu

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated NIC</td>
<td>Controls the on-board LAN controller.</td>
</tr>
<tr>
<td>Enable UEFI Network Stack</td>
<td>Enable or disable UEFI Network Stack.</td>
</tr>
<tr>
<td>SATA Operation</td>
<td>Configure operating mode of the integrated SATA hard drive controller.</td>
</tr>
<tr>
<td>Drives</td>
<td>Enable or disable various drives on board.</td>
</tr>
<tr>
<td>SMART Reporting</td>
<td>Enable or disable Self-Monitoring, Analysis, and Reporting Technology (SMART) during system startup.</td>
</tr>
<tr>
<td>USB Configuration</td>
<td>Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive.</td>
</tr>
<tr>
<td>System Configuration</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Enable External USB Port</td>
<td>Enable or disable booting from USB mass storage devices connected to external USB port.</td>
</tr>
<tr>
<td>Audio</td>
<td>Enable or disable the integrated audio controller.</td>
</tr>
<tr>
<td>Miscellaneous Devices</td>
<td>Enable or disable various onboard devices.</td>
</tr>
<tr>
<td>Enable Camera</td>
<td>Enable or disable the camera.</td>
</tr>
<tr>
<td>Enable Secure Digital (SD) Card</td>
<td>Enable or disable the SD card.</td>
</tr>
</tbody>
</table>

**Table 5. System setup options—Video menu**

<table>
<thead>
<tr>
<th>Video</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD Brightness</td>
<td>Set the panel brightness independently for Battery and AC power.</td>
</tr>
</tbody>
</table>

**Table 6. System setup options—Security menu**

<table>
<thead>
<tr>
<th>Security</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Password</td>
<td>Set, change, or delete the administrator password.</td>
</tr>
<tr>
<td>System Password</td>
<td>Set, change, or delete the system password.</td>
</tr>
<tr>
<td>Internal HDD-0 Password</td>
<td>Set, change, or delete the internal hard-disk drive password.</td>
</tr>
<tr>
<td>Strong Password</td>
<td>Enable or disable strong passwords.</td>
</tr>
<tr>
<td>Password Configuration</td>
<td>Control the minimum and maximum number of characters allowed for the Admin and System passwords.</td>
</tr>
<tr>
<td>Password Bypass</td>
<td>Bypass the System (Boot) Password and the internal HDD password prompts during a system restart.</td>
</tr>
<tr>
<td>Password Change</td>
<td>Enable or disable changes to the System and Hard Disk passwords when an administrator password is set.</td>
</tr>
<tr>
<td>Non-Admin Setup Changes</td>
<td>Determines whether changes to the setup option are permitted when an administrator password is set.</td>
</tr>
</tbody>
</table>
### Security

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEFI Capsule Firmware Updates</td>
<td>Enable or disable BIOS updates through UEFI capsule update packages.</td>
</tr>
<tr>
<td>PTT Security</td>
<td>Enable or disable Platform Trust Technology (PTT) visibility to the operating system.</td>
</tr>
<tr>
<td>Computrace(R)</td>
<td>Enable or disable the BIOS module interface of the optional Computrace(R) Service from Absolute Software.</td>
</tr>
<tr>
<td>CPU XD Support</td>
<td>Enable or disable the Execute Disable mode of the Processor.</td>
</tr>
<tr>
<td>Admin Setup Lockout</td>
<td>Enable to prevent users from entering Setup when an Admin Password is set.</td>
</tr>
<tr>
<td>Master Password Lockout</td>
<td>Enable to prevent users from entering System when an Master Password is set.</td>
</tr>
<tr>
<td>SMM Security Mitigation</td>
<td>Enable or disable SMM Security Mitigation.</td>
</tr>
</tbody>
</table>

**Table 7. System setup options—Secure Boot menu**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure Boot Enable</td>
<td>Enable or disable the secure boot feature.</td>
</tr>
</tbody>
</table>

**Expert Key Management**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Custom Mode</td>
<td>Enable or disable custom mode.</td>
</tr>
<tr>
<td>Expert Key Management</td>
<td>Enable or disable Expert Key Management.</td>
</tr>
<tr>
<td>Custom Mode Key Management</td>
<td>Select the custom values for expert key management.</td>
</tr>
</tbody>
</table>

**Table 8. System setup options—Intel Software Guard Extensions menu**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel SGX Enable</td>
<td>Enable or disable Intel Software Guard Extensions.</td>
</tr>
<tr>
<td>Enclave Memory Size</td>
<td>Set the Intel Software Guard Extensions Enclave Reserve Memory Size.</td>
</tr>
</tbody>
</table>

**Performance**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi Core Support</td>
<td>Enable multiple cores.</td>
</tr>
</tbody>
</table>
Intel Software Guard Extensions

Default: Enabled.

Intel SpeedStep
Enable or disable Intel Speedstep Technology.
Default: Enabled.

NOTE: If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.

C-States Control
Enable or disable additional processor sleep states.
Default: Enabled.

Intel TurboBoost
Enable or disable Intel TurboBoost mode of the processor.
Default: Enabled.

HyperThread Control
Enable or disable HyperThreading in the processor.
Default: Enabled.

Power Management

AC Behavior
Enables the system to turn on automatically, when AC is inserted.

Enable Intel Speed Shift Technology
Enables the Intel Speed Shift Technology.

Auto On Time
Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days.
Default: Disabled.

USB Wake Support
Enable the USB devices to wake the computer from Standby.

Advanced Battery Charge Configuration
Enable Advanced Battery Charge Configuration from the beginning of the day to a specified work period.

Primary Battery Charge Configuration
Set the primary battery charge settings with a preselected custom charge start and stop.
Default: Adaptive.

POST Behavior
Intel Software Guard Extensions

- **Adapter Warnings**: Enable adapter warnings. Default: Enabled.
- **Fn Lock Options**: Enable or disable the Fn lock mode.
- **Fastboot**: Enable to set the speed of the boot process. Default: Thorough.
- **Extend BIOS POST Time**: Set the BIOS POST time.
- **Full Screen Logo**: Enable or disable Full Screen Logo.
- **Warnings and Errors**: Enable or disable Warnings and Errors.

Table 9. System setup options—Virtualization Support menu

**Virtualization Support**

- **Virtualization**: Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology.
- **VT for Direct I/O**: Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O.

Table 10. System setup options—Wireless menu

**Wireless**

- **Wireless Switch**: Determine which wireless devices can be controlled by the Wireless Switch.
- **Wireless Device Enable**: Enable or disable internal wireless devices.

Table 11. System setup options—Maintenance menu

**Maintenance**

- **Service Tag**: Display the system’s Service Tag.
- **Asset Tag**: Create a system Asset Tag.
- **BIOS Downgrade**: Control flashing of the system firmware to previous revisions.
Maintenance

Data Wipe: Enable to securely erase data from all internal storage devices.

BIOS Recovery: Enable the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key.

Table 12. System setup options—System Logs menu

System Logs

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Events</td>
<td>Display the Thermal events.</td>
</tr>
<tr>
<td>Power Events</td>
<td>Display the Power events.</td>
</tr>
</tbody>
</table>

Table 13. System setup options—SupportAssist System Resolution menu

SupportAssist System Resolution

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto OS Recovery</td>
<td>Control the automatic boot flow for SupportAssist System Resolution Console and for the Dell OS Recovery tool.</td>
</tr>
<tr>
<td>Threshold</td>
<td>Control the automatic boot flow for SupportAssist System Resolution Console and for the Dell OS Recovery tool.</td>
</tr>
<tr>
<td>SupportAssist OS Recovery</td>
<td>Enable or disable the boot flow for the SupportAssist OS Recovery tool when certain system errors.</td>
</tr>
</tbody>
</table>

System setup options

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

Table 14. System setup options—Main menu

Main

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Time</td>
<td>Displays the current time in hh:mm:ss format.</td>
</tr>
<tr>
<td>System Date</td>
<td>Displays the current date in mm/dd/yyyy format.</td>
</tr>
<tr>
<td>BIOS Version</td>
<td>Displays the BIOS version.</td>
</tr>
</tbody>
</table>
### Main

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>Displays the model number of your computer.</td>
</tr>
<tr>
<td>Service Tag</td>
<td>Displays the service tag of your computer.</td>
</tr>
<tr>
<td>Asset Tag</td>
<td>Displays the asset tag of your computer.</td>
</tr>
<tr>
<td>CPU Type</td>
<td>Displays the processor type.</td>
</tr>
<tr>
<td>CPU Speed</td>
<td>Displays the processor speed.</td>
</tr>
<tr>
<td>CPU ID</td>
<td>Displays the processor identification code.</td>
</tr>
<tr>
<td>L1 Cache</td>
<td>Displays the processor L1 cache size.</td>
</tr>
<tr>
<td>L2 Cache</td>
<td>Displays the processor L2 cache size.</td>
</tr>
<tr>
<td>First HDD</td>
<td>Displays the type of hard drive installed.</td>
</tr>
<tr>
<td>SATA ODD</td>
<td>Displays the type of optical drive installed.</td>
</tr>
<tr>
<td>AC Adapter Type</td>
<td>Displays the type of AC adapter.</td>
</tr>
<tr>
<td>System Memory</td>
<td>Displays the size of memory installed.</td>
</tr>
<tr>
<td>Memory Speed</td>
<td>Displays the speed of memory.</td>
</tr>
</tbody>
</table>

### Advanced

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtualization</td>
<td>Allows you to enable or disable the Intel Virtualization technology. Default: Enabled</td>
</tr>
<tr>
<td>USB Emulation</td>
<td>Allows you to enable or disable the USB emulation feature. This feature defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST.</td>
</tr>
</tbody>
</table>
**Advanced**

**NOTE:** You cannot boot any type of USB device (floppy, hard drive, or memory key) when this option is off.

Default: Enabled

**USB Wake Support**
Allows you to enable USB devices to wake the computer from standby or to disable the USB wake support feature.

**NOTE:** If USB PowerShare is enabled, a device connected to the USB PowerShare connector may not wake the computer.

Default: Disabled

**SATA Operation**
Allows you to configure the operating mode of the integrated SATA hard drive controller.

Default: AHCI

**Adapter Warnings**
Allows you to choose if the computer should display warning messages when you use AC adapters that are not supported by your computer.

Default: Enabled

**Function Key Behavior**
Allows you to set function key or multimedia key as the default function key behavior.

Default: Multimedia key

**Battery Health**
Displays the battery health.

**Intel (R) Software Guard Extensions**

**Intel SGX Enable**
Enable or disable Intel Software Guard Extensions.

**Enclave Memory Size**
Set the Intel Software Guard Extensions Enclave Reserve Memory Size.

**PRMRR Size**
Set the PRMRR size.
### Advanced

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Recovery from Hard Drive</td>
<td>Enable the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive.</td>
<td>Enabled</td>
</tr>
<tr>
<td>BIOS Auto-Recovery</td>
<td>BIOS auto-recovery automatically recovers BIOS without user actions.</td>
<td>Disabled</td>
</tr>
<tr>
<td>BIOS Recovery Optimization</td>
<td>Allows you to enable or disable the BIOS recovery optimization.</td>
<td>Enabled</td>
</tr>
<tr>
<td><strong>Always Perform Integrity Check</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SupportAssist System Resolution</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto OS Recovery Threshold</td>
<td>Controls the automatic boot flow for SupportAssist System Resolution Console and for the Dell OS Recovery tool.</td>
<td>2</td>
</tr>
<tr>
<td>SupportAssist OS Recovery</td>
<td>Enable or disable the boot flow for the SupportAssist OS Recovery tool in the event of certain system errors.</td>
<td>Disabled</td>
</tr>
<tr>
<td>Battery Charge Configuration</td>
<td>Set the battery charge settings with a preselected custom charge start and stop.</td>
<td>Adaptive</td>
</tr>
<tr>
<td>Advanced Battery Charge Configuration</td>
<td>Enable Advanced Battery Charge Configuration from the beginning of the day to a specified work period.</td>
<td>Disabled</td>
</tr>
</tbody>
</table>
Table 16. System setup options—Security menu

<table>
<thead>
<tr>
<th>Security</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlock Setup Status</td>
<td>Displays if the setup status is unlocked.</td>
</tr>
<tr>
<td>Admin Password Status</td>
<td>Displays if the administrator password is clear or set. Default: Not set</td>
</tr>
<tr>
<td>System password Status</td>
<td>Displays if the system password is clear or set. Default: Not set.</td>
</tr>
<tr>
<td>HDD Password Status</td>
<td>Displays if the HDD password is clear or set. Default: Not set.</td>
</tr>
<tr>
<td>Asset Tag</td>
<td>Set your system’s Asset Tag.</td>
</tr>
<tr>
<td>Admin Password</td>
<td>Allows you to set the administrator password. The administrator password</td>
</tr>
<tr>
<td></td>
<td>controls access to the system setup utility.</td>
</tr>
<tr>
<td>System Password</td>
<td>Allows you to set the system password. The system password controls access</td>
</tr>
<tr>
<td></td>
<td>to the computer at boot.</td>
</tr>
<tr>
<td>HDD password</td>
<td>Allows you to set, change, or delete the hard-disk drive password.</td>
</tr>
<tr>
<td>Password Change</td>
<td>Allows you to permit or deny system password or HDD password changes.</td>
</tr>
<tr>
<td></td>
<td>Default: Permitted</td>
</tr>
<tr>
<td>Password Bypass</td>
<td>Bypass the System (Boot) Password and the internal HDD password prompts</td>
</tr>
<tr>
<td></td>
<td>during a system restart.</td>
</tr>
<tr>
<td>Computrace</td>
<td>Enable or disable the BIOS module interface of the optional Computrace</td>
</tr>
<tr>
<td></td>
<td>Service from Absolute Software.</td>
</tr>
<tr>
<td>Firmware TPM</td>
<td>Enable or disable the firmware TPM.</td>
</tr>
<tr>
<td></td>
<td>Default: Enabled.</td>
</tr>
<tr>
<td>PPI Bypass for Clear Command</td>
<td>Enable or disable PPI Bypass for Clear Command.</td>
</tr>
<tr>
<td></td>
<td>Default: Enabled.</td>
</tr>
</tbody>
</table>
**Security**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEFI Firmware Capsule Updates</td>
<td>Enable or disable BIOS updates through UEFI capsule update packages.</td>
</tr>
<tr>
<td></td>
<td>Default: Enabled.</td>
</tr>
</tbody>
</table>

**Table 17. System setup options—Boot menu**

**Boot**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boot List Option</td>
<td>Displays the available boot options. Default: Legacy.</td>
</tr>
<tr>
<td>File Browser Add Boot Option</td>
<td>Allows to add the boot options.</td>
</tr>
<tr>
<td>File Browser Del Boot Option</td>
<td>Allows to delete the boot options</td>
</tr>
<tr>
<td>Secure Boot</td>
<td>Enable or disable the secure boot feature.</td>
</tr>
<tr>
<td>Boot Option Priorities</td>
<td>Displays the boot sequence.</td>
</tr>
<tr>
<td>Boot Option #1</td>
<td>Displays the available first boot option.</td>
</tr>
</tbody>
</table>

**Table 18. System setup options—Exit menu**

**Exit**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Changes and Reset</td>
<td>Allows you to exit system setup and save your changes.</td>
</tr>
<tr>
<td>Discard Changes and Reset</td>
<td>Allows you to exit system setup and load previous values for all system setup options.</td>
</tr>
<tr>
<td>Restore Defaults</td>
<td>Allows you to restore default values for all system setup options.</td>
</tr>
<tr>
<td>Discard Changes</td>
<td>Allows you to load previous values for all system setup options.</td>
</tr>
<tr>
<td>Save Changes</td>
<td>Allows you to save the changes for all system setup options.</td>
</tr>
</tbody>
</table>
Troubleshooting

Flashing the BIOS

You may need to flash (update) the BIOS when an update is available or when you replace the system board.

Follow these steps to flash the BIOS:

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click Product support, enter the Service Tag of your computer, and then click Submit.

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

4. Click Drivers & downloads → Find it myself.
5. Select the operating system installed on your computer.
6. Scroll down the page and expand BIOS.
7. Click Download to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon and follow the instructions on the screen.

Flashing BIOS (USB key)

1. Follow the procedure from step 1 to step 7 in "Flashing the BIOS" to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information see the knowledge base article SLN143196 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press F12 when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the One Time Boot Menu.
7. Type the BIOS setup program filename and press Enter.
The BIOS Update Utility appears. Follow the instructions on the screen to complete the BIOS update.

Enhanced Pre-Boot System Assessment (ePSA) diagnostics

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

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

⚠️ 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.

For more information, see Dell EPSA Diagnostic 3.0.

Running the ePSA diagnostics

1. Turn on your 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.
4. Click the arrow at the bottom left corner.
   Diagnostics front page is displayed.
5. Click the arrow in the lower-right corner to go to the page listing.
   The items detected are listed.
6. To run a diagnostic test on a specific device, press Esc and click Yes to stop the diagnostic test.
7 Select the device from the left pane and click **Run Tests**.
8 If there are any issues, error codes are displayed.
   Note the error code and validation number and contact Dell.

# Diagnostics

**Power and battery-status light/hard-drive activity light:** Indicates the battery-charge status or the hard-drive activity.

![NOTE: Press Fn+H to toggle this light between power and battery-status light and hard-drive activity light.](image)

**Hard-drive activity light**

Turns on when the computer reads from or writes to the hard drive.

**Power and battery-status light**

Indicates the power and battery-charge status.

- **Solid white** – Power adapter is connected and the battery has more than 5 percent charge.
- **Amber** – Computer is running on battery and the battery has less than 5 percent charge.
- **Off**
  - Power adapter is connected and the battery is fully charged.
  - Computer is running on battery and the battery has more than 5 percent charge.
  - Computer is in sleep state, hibernation, or turned off.

The power and battery-status light blinks amber along with beep codes indicating failures.

For example, the power and battery-status light blinks amber two times followed by a pause, and then blinks white three times followed by a pause. This 2,3 pattern continues until the computer is turned off indicating no memory or RAM is detected.

The following table shows different light patterns and what they indicate.

<table>
<thead>
<tr>
<th>Light Pattern</th>
<th>Problem description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,1</td>
<td>CPU failure</td>
</tr>
<tr>
<td>2,2</td>
<td>System board: BIOS and ROM failure</td>
</tr>
</tbody>
</table>
### Light Pattern

<table>
<thead>
<tr>
<th>Light Pattern</th>
<th>Problem description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,3</td>
<td>No memory or RAM detected</td>
</tr>
<tr>
<td>2,4</td>
<td>Memory or RAM failure</td>
</tr>
<tr>
<td>2,5</td>
<td>Invalid memory installed</td>
</tr>
<tr>
<td>2,6</td>
<td>System board or chipset error</td>
</tr>
<tr>
<td>2,7</td>
<td>LCD failure</td>
</tr>
<tr>
<td>3,1</td>
<td>CMOS battery failure</td>
</tr>
<tr>
<td>3,2</td>
<td>PCI or video card or chip failure</td>
</tr>
<tr>
<td>3,3</td>
<td>Recovery image not found</td>
</tr>
<tr>
<td>3,4</td>
<td>Recovery image found but invalid</td>
</tr>
</tbody>
</table>

The computer may emit a series of beeps during start-up if the errors or problems cannot be displayed. The repetitive beep codes help the user troubleshoot problems with the computer.

**Camera status light:** Indicates whether the camera is in use.

- Solid white – Camera is in use.
- Off – Camera is not in use.

**Caps Lock status light:** Indicates whether Caps Lock is enabled or disabled.

- Solid white – Caps Lock enabled.
- Off – Caps Lock disabled.

### Flea power release

Flea power is the residual static electricity that remains on the computer even after it has been powered off and the battery has been removed. The following procedure provides the instructions on how to conduct flea power release:

1. Turn off your computer.
2. Remove the **base cover**.
3. Press and hold the power button for 15 seconds to drain the flea power.
4. Replace the **base cover**.
5. Turn on your computer.
Wi-Fi power cycle

If your computer is unable to access the internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.
Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 20. Self-help resources

<table>
<thead>
<tr>
<th>Information about Dell products and services</th>
<th><a href="http://www.dell.com">www.dell.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Help &amp; Support app</td>
<td></td>
</tr>
<tr>
<td>Tips</td>
<td></td>
</tr>
<tr>
<td>Contact Support</td>
<td></td>
</tr>
<tr>
<td>Online help for operating system</td>
<td></td>
</tr>
<tr>
<td>Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.</td>
<td><a href="http://www.dell.com/support">www.dell.com/support</a></td>
</tr>
<tr>
<td>Dell knowledge base articles for a variety of computer concerns.</td>
<td><a href="http://www.dell.com/support">www.dell.com/support</a></td>
</tr>
</tbody>
</table>

Learn and know the following information about your product:

- Product specifications
- Operating system

See Me and My Dell at www.dell.com/support/manuals.
• Setting up and using your product
• Data backup
• Troubleshooting and diagnostics
• Factory and system restore
• BIOS information

To locate the *Me and My Dell* relevant to your product, identify your product through one of the following:

• Select *Detect Product*.
• Locate your product through the drop-down menu under *View Products*.
• Enter the *Service Tag number* or *Product ID* in the search bar.

### Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see [www.dell.com/contactdell](http://www.dell.com/contactdell).

⚠️ **NOTE:** Availability varies by country and product, and some services may not be available in your country.

⚠️ **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.