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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Working on your computer

Before working inside your computer

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

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

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

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

⚠️ **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**).

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

3. Disconnect all network cables from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets.
5. Press and hold the power button while the computer is unplugged to ground the system board.
6. Remove the cover.

⚠️ **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.

### 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. Turning off your computer:
• In Windows 10 (using a touch enabled device or mouse):
  1. Click or tap.
  2. Click or tap and then click or touch **Shut down**.
• In Windows 8 (using a touch enabled device):
  1. Swipe in from the right edge of the screen, opening the **Charms** menu and select **Settings**.
  2. Tap and then tap **Shut down**
• In Windows 8 (using a mouse):
  1. Point to upper-right corner of the screen and click **Settings**.
  2. Click and then click **Shut down**.
• In Windows 7:
  1. Click **Start**.
  2. Click **Shut Down**.

Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

**After working inside your computer**

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

1. Replace the cover.
   
   △ **CAUTION:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.
2. Connect any telephone or network cables to your computer.
3. Connect your computer and all attached devices to their electrical outlets.
4. Turn on your computer.
5. If required, verify that the computer works correctly by running **Dell Diagnostics**.
Removing and installing components

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

Recommended tools

The procedures in this document require the following tools:

- Small flat blade screwdriver
- Phillips screwdriver
- Small plastic scribe

Removing the cover

1. Follow the procedure in Before Working Inside Your Computer.
2. To remove the cover:
   a. Slide the blue tab to release the cover from the computer [1].
   b. Slide the cover toward the back of the computer and lift it away from the computer [2].

Installing the cover

1. Place the cover on the computer and slide the cover forward until it clicks into place.
2. Follow the procedure in After Working Inside Your Computer.

Removing the bezel

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the cover.
3. To remove the front bezel:
a Lift the tabs to release the front bezel from the computer.
b Remove the front bezel from the computer.

Installing the bezel
1 Insert the tabs on the bezel into the slots on the computer.
2 Press the bezel until the tabs clicks into place.
3 Install the cover.
4 Follow the procedure in After Working Inside Your Computer.

Opening the front bezel door
1 Follow the procedure in Before Working Inside Your Computer.
2 Remove the:
   • cover
   • bezel
3 Pull the front bezel door to open it.
Removing the hard drive assembly

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the hard drive assembly:
   a. Disconnect the hard drive assembly cables from the connectors on the hard drive [1, 2].
   b. Press the blue tabs on both sides [3] and pull the hard drive assembly out of the computer [4].

Removing the hard drive from the hard drive bracket

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   a. cover
   b. bezel
   c. hard drive assembly
3. To remove the hard drive bracket:
   a. Pull one side of the hard drive bracket to disengage the pins on the bracket from the slots on the hard drive [1].
   b. Lift the hard drive out of the hard drive bracket [2].
Installing the hard drive into the hard drive bracket

1. Align and insert the pins on the hard drive bracket with the slots on one side of the hard drive.
2. Flex the other side of the hard drive bracket, and align and insert the pins on the bracket into the hard drive.
3. Install the:
   a. hard drive assembly
   b. bezel
   c. cover
4. Follow the procedure in After Working Inside Your Computer.

Installing the hard drive assembly

1. Insert the hard drive assembly into the slot on the computer until it clicks into place.
2. Close the front bezel door.
3. Connect the SATA cable and the power cable to the connectors on the hard drive.
4. Install the:
   • bezel
   • cover
5. Follow the procedure in After Working Inside Your Computer.

Removing the optical drive

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   • cover
   • bezel
3. To remove the optical drive:
   a. Open the front bezel door.
   b. Disconnect the data cable and power cable from the connectors on the optical drive [1, 2].
   c. Close the front bezel door [3].
   d. Press the blue release tab [4] and slide the optical drive out of the computer [5].
Installing the optical drive

1. Insert the optical drive into the optical drive bay until it clicks into place.
2. Open the front bezel door.
3. Connect the data cable and power cable to the connectors on the optical drive.
4. Close the front bezel door.
5. Install the:
   - bezel
   - cover
6. Follow the procedure in After Working Inside Your Computer.

Removing the optical drive (3.5-inch)

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. To remove the optical drive:
   a. Disconnect the data cable and power cable from the connectors on the optical drive [1, 2].
   b. Press the blue release tab [3] and slide the optical drive out of the optical drive bay [4].

Installing the optical drive (3.5-inch)

1. Insert the optical drive into the optical drive bay until it clicks into place.
2. Connect the data cable and power cable to the connectors on the optical drive.
3. Install the:
   - bezel
   - cover
4. Follow the procedure in After Working Inside Your Computer.

Installing the optional SSD card

1. Remove the:
2 Open the front bezel door.
3 Peel the adhesive tape (blue) from the rubber.
4 Place the rubber on the system board [1] and peel the adhesive tape (pink) from the rubber [2].
5 To install the SSD card:
   a Connect the SSD card to the connector on the system board [1].
   b Tighten the screw to secure the SSD card to the system board [2].
6 Close the front bezel door.
Removing the optional SSD card

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. Remove the screw that secures the SSD card to the system board.
5. Disconnect the SSD card from the connector on the system board.
6. Remove the rubber from the system board.

Removing the SD card reader

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the SD card reader:
   a. Disconnect the SD card reader cable from the connector on the system board [1].
   b. Remove the screw that secures the SD card reader to the computer [2].
   c. Lift the SD card reader out of the computer [3].

Installing the SD card reader

1. Insert the SD card reader into the slot on the system board.
2. Tighten the screw to secure the SD card reader to the system board.
3. Connect the SD card reader cable to the connector on the system board.
4. Close the front bezel door.
5. Install the:
   a. bezel
   b. cover
Removing the memory module

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the memory module:
   a. Press the memory module retention tabs on both sides of the memory module.
   b. Lift the memory module from the memory module connector on the system board.

Installing the memory module

1. Align the notch on the memory module with the tab on the memory module connector.
2. Insert the memory module into the memory module socket.
3. Press the memory module until the memory module retention tabs click into place.
4. Close the front bezel door.
5. Install the:
   a. cover
   b. bezel
6. Follow the procedure in After Working Inside Your Computer.

Removing the PCIe expansion card

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the PCIe expansion card:
   a. Pull the release latch to unlock the PCIe expansion card [1].
   b. Push the release tab [2] and lift the PCIe expansion card out of the computer [3].
Installing the PCIe expansion card

1. Pull the release latch to open it.
2. Insert the PCIe expansion card to the connector on the system board.
3. Secure the PCIe expansion card by pushing the card retention latch until it clicks into place.
4. Repeat the steps to install any additional PCIe expansion card.
5. Close the release latch.
6. Close the front bezel door.
7. Install the:
   a. bezel
   b. cover
8. Follow the procedure in After Working Inside Your Computer.

Removing the optional Ethernet port card

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   • cover
   • bezel
3. Open the front bezel door.
4. To remove the Ethernet port card:
   a. Pull the release latch to open it [1].
   b. Hold the Ethernet port card and pull it to disengage it from the slot on the system board.
   c. Lift the Ethernet port card from the computer [2].
Installing the optional Ethernet port card

1. Pull the release latch to open it.
2. Align the Ethernet port card with the slot on the back on the computer and the card connector with the connector on the system board.
3. Insert the Ethernet port card into the connector on the system board until it clicks into place.
4. Close the release latch.
5. Install the:
   a. bezel
   b. cover
6. Close the front bezel door.
7. Follow the procedure in After Working Inside Your Computer.

Removing the power supply unit (PSU)

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the PSU:
   a. Remove the screws that secure the PSU to the computer [1].
   b. Disconnect the PSU cables from the connectors on the system board [2, 3].
   c. Unroute the PSU cables from the retention clips.
   d. Press the metal release tab [4], slide the PSU toward the back and lift it out of the computer [5].
Installing the power supply unit (PSU)

1. Insert the PSU into the PSU slot and slide it toward the back of the computer until it clicks into place.
2. Tighten the screws to secure the PSU to the computer.
3. Route the PSU cables through the retention clips.
4. Connect the PSU cables to the connectors on the system board.
5. Close the front bezel door.
6. Install the:
   - bezel
   - cover
7. Follow the procedure in After Working Inside Your Computer.

Removing the VGA daughter board

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door
4. To remove the VGA daughter board:
   a. Remove the screws that secure the VGA connector to the computer [1].
   b. Slide the VGA connector to release it from the computer [2].
   c. Remove the screw that secures the VGA daughter board to the computer [3].
   d. Lift the VGA daughter board using the handle to remove it from the computer [4].
Installing the VGA daughter board

1. Align the VGA daughter board with the screw holder on the system board.
2. Tighten the screw to secure the VGA daughter board to the system board.
3. Insert the VGA connector into the slot at the back of the computer.
4. Tighten the screws to secure the VGA connector to the computer.
5. Close the front bezel door.
6. Install the:
   - bezel
   - cover
7. Follow the procedure in After Working Inside Your Computer.

Removing the intrusion switch

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the intrusion switch:
   a. Disconnect the intrusion switch cable from the connector on the system board [1].
   b. Unroute the intrusion switch cable from the fan grommet [2].
   c. Slide the intrusion switch and lift it away from the computer [3].
Installing the intrusion switch

1. Insert the intrusion switch into the slot on the computer.
2. Route the intrusion switch cable through the fan grommet.
3. Connect the intrusion switch cable to the connector on the system board.
4. Close the front bezel door.
5. Install the:
   - bezel
   - cover
6. Follow the procedure in After Working Inside Your Computer.

Removing the power switch

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the power switch:
   a. Disconnect the power switch cable from the system board [1].
   b. Unroute the power switch cable from the retention clip.
   c. Press the release tab [2] and slide the power switch out of the computer [3].
Installing the power switch

1. Insert the power switch into the slot and press it until it clicks into place.
2. Route the power switch cable through the cable retention clip.
3. Connect the power switch cable to the connector on the system board.
4. Close the front bezel door.
5. Install the:
   - bezel
   - cover
6. Follow the procedure in After Working Inside Your Computer.

Removing the speaker

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the speaker:
   a. Disconnect the speaker cable from the connector on the system board [1].
   b. Close the front bezel door.

Installing the speaker

1. Insert the speaker into the slot and press it until it clicks into place.
2. Open the front bezel door.
3. Connect the speaker cable to the connector on the system board.
4. Close the front bezel door.
5. Install the:
   a. bezel
   b. cover
6. Follow the procedure in After Working Inside Your Computer.
Removing the coin cell battery

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the coin cell battery:
   a. Using a plastic scribe, release the coin cell battery until it pops out.
   b. Remove the coin cell battery from the connector on the system board.

Installing the coin cell battery

1. Hold the coin cell battery with the "+" sign facing up and slide it under the securing tabs at the positive side of the connector.
2. Press the battery into the connector until it locks into place.
3. Close the front bezel door.
4. Install the:
   - bezel
   - cover
5. Follow the procedure in After Working Inside Your Computer.

Removing the heat sink assembly

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. To remove the heat sink assembly:
   a. Disconnect the heat sink assembly cable from the connector on the system board [1].
   b. Loosen the captive screws that secure the heat sink assembly to the system board [2, 3, 4, 5].
   c. Lift the heat sink assembly away from the computer [6].
Installing the heat sink assembly

1. Place the heat sink assembly on the processor.
2. Tighten the captive screws to secure the heat sink assembly to the system board.
3. Connect the heat sink assembly cable to the connector on the system board.
4. Close the front bezel door.
5. Install the:
   - bezel
   - cover
6. Follow the procedure in After Working Inside Your Computer.

Removing the processor

1. Follow the procedure in Before Working Inside Your Computer.
2. Remove the:
   - cover
   - bezel
3. Open the front bezel door.
4. Remove the heat sink assembly.
5. To remove the processor:
   a. Release the socket lever by pushing the lever down and out from under the tab on the processor shield [1].
   b. Lift the lever upward and lift the processor shield [2].
   c. Lift the processor out of the socket [3].

⚠️ CAUTION: The processor socket pins are fragile and can be permanently damaged. Be careful not to bend the pins in the processor socket when removing the processor out of the socket.
Installing the processor

1. Align the processor with the socket keys.

⚠️ **CAUTION:** Do not use force to seat the processor. When the processor is positioned correctly, it engages easily into the socket.

2. Align the pin-1 indicator of the processor with the triangle on the socket.

3. Place the processor on the socket such that the slots on the processor align with the socket keys.

4. Close the processor shield by sliding it under the retention screw.

5. Lower the socket lever and push it under the tab to lock it.

6. Install the heat sink assembly.

7. Close the front bezel door.

8. Install the:
   a. **bezel**
   b. **cover**


Removing the system fan

1. Follow the procedure in Before Working Inside Your Computer.

2. Remove the:
   a. **cover**
   b. **bezel**

3. Open the front bezel door.

4. To remove the system fan:
   a. Disconnect the system fan cable from the connector on the system board [1].
   b. Stretch the grommets securing the fan to the computer to ease the removal of the fan [2].
   c. Slide the system fan out of the computer [3].

Installing the system fan

1. Hold the system fan by the sides with the cable end facing the bottom of the computer.

2. Insert the grommets into the slots on the back of the computer.

3. Pass the grommets through the corresponding grooves on the system fan.

4. Stretch the grommets and slide the system fan toward the computer until it locks into place.
NOTE: Install the lower two grommets first.

5 Connect the system fan cable to the connector on the system board.
6 Close the front bezel door.
7 Install the:
   a bezel
   b cover
8 Follow the procedure in After Working Inside Your Computer.

Removing the system board

1 Follow the procedure in Before Working Inside Your Computer.
2 Remove the:
   • cover
   • bezel
3 Open the front bezel door.
4 Remove the:
   • heat sink assembly
   • processor
   • PCIe expansion card
   • VGA daughter board
   • optional Ethernet port card
   • optional SSD card
   • memory module
5 Disconnect all the cables from the connectors on the system board.
6 To remove the system board:
   a Remove the screws that secure the system board to the computer [1].
   b Slide the system board toward the front of the computer and lift it away from the computer [2].

Installing the system board

1 Hold the system board by its edges and angle it toward the back of the computer.
2 Lower the system board into the computer until the connectors at the back of the system board align with the slots on the back wall of the computer, and the screw holes on the system board align with the standoffs on the computer.
3 Tighten the screws to secure the system board to the computer.
4 Route all the cables through the routing channels and connect all the cables to the connectors on the system board.
5 Install the:
• memory module
• optional SSD card
• optional Ethernet port card
• PCIe expansion card
• VGA daughter board
• processor
• heat sink assembly

6 Close the front bezel door.

7 Install the:
   • bezel
   • cover

8 Follow the procedure in After Working Inside Your Computer.
Troubleshooting your computer

You can troubleshoot your computer using indicators like diagnostic lights, beep codes, and error messages during the operation of the computer.

## Diagnostic and Power LED codes

### Table 1. Power LED states

<table>
<thead>
<tr>
<th>Power LED light status</th>
<th>Possible cause</th>
<th>Troubleshooting steps</th>
</tr>
</thead>
</table>
| Off                    | The computer is either turned off or is not receiving power or in Hibernation mode. | • Re-seat the power cable in the power connector on the back of the computer and the electrical outlet.  
• If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and is turned on. Also, bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly.  
• Ensure the electrical outlet is working by testing it with another device, such as a lamp. |
| Solid amber / blinking amber | The second state of the LED at power up, indicates that the POWER_GOOD signal is active and it is probable that the power supply is fine.  
Initial State of LED at power up. Refer to the table below for Blinking Amber pattern diagnostic suggestions and possible failures. | • Remove and reinstall any cards.  
• Remove and reinstall the graphics card, if applicable.  
• Ensure the power cable is connected to the system board and processor. |
| Slow Blinking white light | System is in a low power state, either S1 or S3. This does not indicate a fault condition. | • Press the power button to bring the computer out of the sleep mode.  
• Ensure all power cables are securely connected to the system board.  
• Ensure the main power cable and front panel cable are connected to the system board. |
| Steady white | The computer is fully functional and in the On state. | If the computer is not responding, do the following: |
### Power LED light status

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Troubleshooting steps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Ensure the display is connected and turned on.</td>
</tr>
<tr>
<td></td>
<td>• If the display is connected and turned on, listen for a beep code.</td>
</tr>
</tbody>
</table>

1. **NOTE:** Amber LED blinking pattern: The pattern is 2 or 3 blinks followed by a short pause then X number of blinks up to 7. The repeated pattern has a long pause inserted in the middle. Example 2,3 = 2 amber blinks, short pause, 3 amber blinks followed by long pause then repeats.

### Table 2. Diagnostic power LED codes

<table>
<thead>
<tr>
<th>State</th>
<th>State Name</th>
<th>Blinking Amber Pattern</th>
<th>Problem Description</th>
<th>Suggested Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>2 blinks &gt; short pause &gt; 1 blink &gt; long pause &gt; repeats</td>
<td>Bad Motherboard</td>
<td>Replace the motherboard</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>2 blinks &gt; short pause &gt; 2 blinks &gt; long pause &gt; repeats</td>
<td>Bad Motherboard, Power Supply or Power Supply cabling</td>
<td>If customer can assist to troubleshoot, narrow down the issue with PSU BIST Test, reseat cable. If nothing works, replace the motherboard, power supply or cabling</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>2 blinks &gt; short pause &gt; 3 blinks &gt; long pause &gt; repeats</td>
<td>Bad Motherboard, Memory or Processor</td>
<td>If customer can assist to troubleshoot, narrow down the issue by reseating memory and swapping an available known good memory. If nothing works, replace the motherboard, memory or processor</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>2 blinks &gt; short pause &gt; 4 blinks &gt; long pause &gt; repeats</td>
<td>Bad coin cell battery</td>
<td>If customer can assist to troubleshoot, narrow down the issue by swapping a known good coin cell battery if available. If nothing works, replace the coin cell battery</td>
</tr>
<tr>
<td>S1</td>
<td>RCM</td>
<td>2 blinks &gt; short pause &gt; 5 blinks &gt; long pause &gt; repeats</td>
<td>BIOS Checksum Failure</td>
<td>System is in Recovery Mode. Flash latest BIOS version. If problem persists, replace the motherboard</td>
</tr>
<tr>
<td>S2</td>
<td>CPU</td>
<td>2 blinks &gt; short pause &gt; 6 blinks &gt; long pause &gt; repeats</td>
<td>Bad Processor</td>
<td>CPU configuration activity is in progress or a CPU failure was</td>
</tr>
<tr>
<td>State</td>
<td>State Name</td>
<td>Blinking Amber Pattern</td>
<td>Problem Description</td>
<td>Suggested Resolution</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
<td>------------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>S3</td>
<td>MEM</td>
<td>2 blinks &gt; short pause &gt; 7 blinks &gt; long pause &gt; repeats</td>
<td>Memory failures</td>
<td>Memory subsystem configuration activity is in progress. Appropriate memory modules were detected but a memory failure has occurred. If customer can assist to troubleshoot, narrow down the issue with reseatting memory and swapping a known good memory if available. If nothing works, replace the memory.</td>
</tr>
<tr>
<td>S4</td>
<td>PCI</td>
<td>3 blinks &gt; short pause &gt; 1 blinks &gt; long pause &gt; repeats</td>
<td>PCIe Device or Video subsystem failures</td>
<td>PCIe device configuration activity is in progress or PCIe device failure was detected. If customer can assist to troubleshoot, narrow down the issue by reseatting PCIe card and removing one by one to determine which card failed. If identified the PCIe card failed, replace the PCIe Card. If none of the PCIe Cards failed, replace the motherboard.</td>
</tr>
<tr>
<td>S5</td>
<td>VID</td>
<td>3 blinks &gt; short pause &gt; 2 blinks &gt; long pause &gt; repeats</td>
<td>Video Subsystem failure</td>
<td>Video subsystem configuration activity in progress or video subsystem failure. If customer can assist to troubleshoot, narrow down the issue by removing one by one to determine which card failed. If identified the card failed, replace the card. If none of the card failed, replace the motherboard.</td>
</tr>
<tr>
<td>S6</td>
<td>STO</td>
<td>3 blinks &gt; short pause &gt; 3 blinks &gt; long pause &gt; repeats</td>
<td>No Memory detected</td>
<td>If customer can assist to troubleshoot, narrow down the issue by removing one by one</td>
</tr>
<tr>
<td>State</td>
<td>State Name</td>
<td>Blinking Amber Pattern</td>
<td>Problem Description</td>
<td>Suggested Resolution</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
<td>------------------------</td>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>S7</td>
<td>USB</td>
<td>3 blinks &gt; short pause &gt; 4 blinks &gt; long pause &gt; repeats</td>
<td>Storage Subsystem failure</td>
<td>Possible storage device configuration in progress or storage subsystem failure. If customer can assist to troubleshoot, narrow down the issue by removing one by one storages on motherboard to determine which one failed. If identified the storage failed, replace the storage. If none of the component failed, replace the motherboard.</td>
</tr>
<tr>
<td>S8</td>
<td>MEM</td>
<td>3 blinks &gt; short pause &gt; 5 blinks &gt; long pause &gt; repeats</td>
<td>Memory configuration or incompatible error</td>
<td>Memory subsystem configuration activity is in progress. No memory modules were detected. If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed. Also, combining the configuration to validate appropriate combination. If identified the component failed, replace the component. If none of the component failed, replace the motherboard.</td>
</tr>
<tr>
<td>S9</td>
<td>MBF</td>
<td>3 blinks &gt; short pause &gt; 6 blinks &gt; long pause &gt; repeats</td>
<td>System board failure</td>
<td>Fatal system board failure detected.</td>
</tr>
</tbody>
</table>
### State Name

<table>
<thead>
<tr>
<th>State</th>
<th>State Name</th>
<th>Blinking Amber Pattern</th>
<th>Problem Description</th>
<th>Suggested Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>S10</td>
<td>MEM</td>
<td>3 blinks &gt; short pause &gt; 7 blinks &gt; long pause &gt; repeats</td>
<td>Possible memory failure</td>
<td>Memory subsystem configuration activity is in progress. Memory modules have been detected but appear to be incompatible or in an invalid configuration. If customer can assist to troubleshoot, narrow down the issue by removing one by one the memory on motherboard to determine which one failed. If identified the memory failed, replace the memory. If else, replace the motherboard.</td>
</tr>
</tbody>
</table>

⚠️ **WARNING:** The power LED only serve as an indicator of the progress through the POST process. These LEDs do not indicate the problem that caused the POST routine to stop.

### Diagnostic error messages

#### Table 3. Diagnostic error messages

<table>
<thead>
<tr>
<th>Error messages</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUXILIARY DEVICE FAILURE</td>
<td>The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the <strong>Pointing Device</strong> option in the System Setup program.</td>
</tr>
<tr>
<td>BAD COMMAND OR FILE NAME</td>
<td>Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.</td>
</tr>
<tr>
<td>CACHE DISABLED DUE TO FAILURE</td>
<td>The primary cache internal to the microprocessor has failed. <strong>Contact Dell.</strong></td>
</tr>
<tr>
<td>CD DRIVE CONTROLLER FAILURE</td>
<td>The optical drive does not respond to commands from the computer.</td>
</tr>
<tr>
<td>Error messages</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>DATA ERROR</td>
<td>The hard drive cannot read the data.</td>
</tr>
<tr>
<td>DECREASING AVAILABLE MEMORY</td>
<td>One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.</td>
</tr>
<tr>
<td>DISK C: FAILED INITIALIZATION</td>
<td>The hard drive failed initialization. Run the hard drive tests in Dell Diagnostics.</td>
</tr>
<tr>
<td>DRIVE NOT READY</td>
<td>The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.</td>
</tr>
<tr>
<td>ERROR READING PCMCIA CARD</td>
<td>The computer cannot identify the ExpressCard. Reinsert the card or try another card.</td>
</tr>
<tr>
<td>EXTENDED MEMORY SIZE HAS CHANGED</td>
<td>The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, Contact Dell.</td>
</tr>
<tr>
<td>THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE</td>
<td>The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.</td>
</tr>
<tr>
<td>A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * &quot; &lt; &gt;</td>
<td>Do not use these characters in filenames.</td>
</tr>
<tr>
<td>GATE A20 FAILURE</td>
<td>A memory module may be loose. Reinstall the memory module or, if necessary, replace it.</td>
</tr>
<tr>
<td>GENERAL FAILURE</td>
<td>The operating system is unable to carry out the command. The message is usually followed by specific information. For example, Printer out of paper. Take the appropriate action.</td>
</tr>
<tr>
<td>HARD-DISK DRIVE CONFIGURATION ERROR</td>
<td>The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the Hard Disk Drive tests in Dell Diagnostics.</td>
</tr>
<tr>
<td>HARD-DISK DRIVE CONTROLLER FAILURE 0</td>
<td>The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics.</td>
</tr>
<tr>
<td>HARD-DISK DRIVE FAILURE</td>
<td>The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics.</td>
</tr>
<tr>
<td>HARD-DISK DRIVE READ FAILURE</td>
<td>The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics.</td>
</tr>
<tr>
<td>INSERT BOOTABLE MEDIA</td>
<td>The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.</td>
</tr>
<tr>
<td>Error messages</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>INVALID CONFIGURATION INFORMATION—PLEASE RUN SYSTEM SETUP PROGRAM</td>
<td>The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.</td>
</tr>
<tr>
<td>KEYBOARD CLOCK LINE FAILURE</td>
<td>For external keyboards, check the cable connection. Run the <strong>Keyboard Controller</strong> test in Dell Diagnostics.</td>
</tr>
<tr>
<td>KEYBOARD CONTROLLER FAILURE</td>
<td>For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the <strong>Keyboard Controller</strong> test in Dell Diagnostics.</td>
</tr>
<tr>
<td>KEYBOARD DATA LINE FAILURE</td>
<td>For external keyboards, check the cable connection. Run the <strong>Keyboard Controller</strong> test in Dell Diagnostics.</td>
</tr>
<tr>
<td>KEYBOARD STUCK KEY FAILURE</td>
<td>For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys during the boot routine. Run the <strong>Stuck Key</strong> test in Dell Diagnostics.</td>
</tr>
<tr>
<td>LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT</td>
<td>Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.</td>
</tr>
<tr>
<td>MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE</td>
<td>A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.</td>
</tr>
<tr>
<td>MEMORY ALLOCATION ERROR</td>
<td>The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.</td>
</tr>
<tr>
<td>MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE</td>
<td>A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.</td>
</tr>
<tr>
<td>MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE</td>
<td>A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.</td>
</tr>
<tr>
<td>MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE</td>
<td>A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.</td>
</tr>
<tr>
<td>NO BOOT DEVICE AVAILABLE</td>
<td>The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.</td>
</tr>
<tr>
<td>NO BOOT SECTOR ON HARD DRIVE</td>
<td>The operating system may be corrupted. Contact Dell.</td>
</tr>
<tr>
<td>NO TIMER TICK INTERRUPT</td>
<td>A chip on the system board may be malfunctioning. Run the <strong>System Set</strong> tests in Dell Diagnostics.</td>
</tr>
<tr>
<td>NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN</td>
<td>You have too many programs open. Close all windows and open the program that you want to use. Reinstall the operating system. If the problem persists, Contact Dell.</td>
</tr>
<tr>
<td>OPERATING SYSTEM NOT FOUND</td>
<td>The optional ROM has failed. Contact Dell.</td>
</tr>
<tr>
<td>OPTIONAL ROM BAD CHECKSUM</td>
<td>The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See Windows Help and Support for instructions (click Start &gt; Help and Support). If a large</td>
</tr>
</tbody>
</table>
### System error messages

#### Table 4. System error messages

<table>
<thead>
<tr>
<th>System message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support</td>
<td>The computer failed to complete the boot routine three consecutive times for the same error.</td>
</tr>
<tr>
<td>CMOS checksum error</td>
<td>RTC is reset, <strong>BIOS Setup</strong> default has been loaded.</td>
</tr>
<tr>
<td>CPU fan failure</td>
<td>CPU fan has failed.</td>
</tr>
<tr>
<td>System fan failure</td>
<td>System fan has failed.</td>
</tr>
<tr>
<td>Hard-disk drive failure</td>
<td>Possible hard disk drive failure during POST.</td>
</tr>
<tr>
<td>Keyboard failure</td>
<td>Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.</td>
</tr>
<tr>
<td>No boot device available</td>
<td>No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists.</td>
</tr>
<tr>
<td></td>
<td>• If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device.</td>
</tr>
<tr>
<td></td>
<td>• Enter system setup and ensure that the boot sequence information is correct.</td>
</tr>
<tr>
<td>System message</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>No timer tick interrupt</td>
<td>A chip on the system board might be malfunctioning or motherboard failure.</td>
</tr>
</tbody>
</table>

NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem.

S.M.A.R.T error, possible hard disk drive failure.
System Setup

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

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

Topics:

• Boot Sequence
• Navigation keys
• System Setup overview
• Accessing System Setup
• Updating the BIOS
• System and setup password

Boot Sequence

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

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

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

• Removable Drive (if available)
• STXXXX Drive

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

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

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

Navigation keys

The following table displays the system setup navigation keys.

| NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.
Table 5. Navigation keys

<table>
<thead>
<tr>
<th>Keys</th>
<th>Navigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up arrow</td>
<td>Moves to the previous field.</td>
</tr>
<tr>
<td>Down arrow</td>
<td>Moves to the next field.</td>
</tr>
<tr>
<td>Enter</td>
<td>Allows you to select a value in the selected field (if applicable) or follow the link in the field.</td>
</tr>
<tr>
<td>Spacebar</td>
<td>Expands or collapses a drop-down list, if applicable.</td>
</tr>
<tr>
<td>Tab</td>
<td>Moves to the next focus area.</td>
</tr>
</tbody>
</table>

⚠️ | NOTE: For the standard graphics browser only.                           |

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

F1   | Displays the System Setup help file.                                      |

System Setup overview

System Setup allows you to:

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

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

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

Accessing System Setup

1. Turn on (or restart) your computer.
2. After the white Dell logo appears, press F2 immediately.
   The System Setup page is displayed.
   ⚠️ | NOTE: If you wait too long and the operating system logo appears, wait until you see the desktop. Then, shut down or restart your computer and try again. |
   ⚠️ | NOTE: After the Dell logo appears, you can also press F12 and then select BIOS setup. |

Updating the BIOS

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

1. Restart the computer.
2. Go to Dell.com/support.
3. Enter the Service Tag or Express Service Code and click Submit.
   ⚠️ | NOTE: To locate the Service Tag, click Where is my Service Tag? |
   ⚠️ | NOTE: If you cannot find your Service Tag, click Detect My Product. Proceed with the instructions on screen. |
4. If you are unable to locate or find the Service Tag, click the Product Category of your computer.
5. Choose the Product Type from the list.
Select your computer model and the Product Support page of your computer appears.

Click Get drivers and click View All Drivers.

The Drivers and Downloads page opens.

On the Drivers and Downloads screen, under the Operating System drop-down list, select BIOS.

Identify the latest BIOS file and click Download File.

You can also analyze which drivers need an update. To do this for your product, click Analyze System for Updates and follow the instructions on the screen.

Select your preferred download method in the Please select your download method below window, click Download File.

The File Download window appears.

Click Save to save the file on your computer.

Click Run to install the updated BIOS settings on your computer.

Follow the instructions on the screen.

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

System and setup password

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

<table>
<thead>
<tr>
<th>Password type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System password</td>
<td>Password that you must enter to log on to your system.</td>
</tr>
<tr>
<td>Setup password</td>
<td>Password that you must enter to access and make changes to the BIOS settings of your computer.</td>
</tr>
</tbody>
</table>

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

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

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

Assigning a system password and setup password

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

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

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

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

The System Security screen appears.

2 In the System Security screen, verify that Password Status is Unlocked.

3 Select System Password, enter your system password, and press Enter or Tab.

Use the following guidelines to assign the system password:

- A password can have up to 32 characters.
- The password can contain the numbers 0 through 9.
- Only lower case letters are valid, upper case letters are not allowed.
- Only the following special characters are allowed: space, ("), (+), (-), (.), (/), (;), ([), (]), (]), (`).

Re-enter the system password when prompted.

4 Type the system password that you entered earlier and click OK.

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

Deleting or changing an existing system and/or setup password

Ensure that the Password Status is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the Password Status is Locked.

To enter the System Setup, press F2 immediately after a power-on or reboot.

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

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

NOTE: Offerings may vary by region. For more information regarding the configuration of your computer in:

- Windows 10, click or tap Start > Settings > System > About.
- Windows 8.1 and Windows 8, click or tap Start > PC Settings > PC and devices > PC Info.
- Windows 7, click Start, right-click My Computer, and then select Properties.

Table 6. Processor

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor type</td>
<td>6th Generation Intel Core i3/i5/i7 series</td>
</tr>
<tr>
<td>Total cache</td>
<td>Up to 8 MB cache depending on processor type</td>
</tr>
</tbody>
</table>

Table 7. Memory

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>DDR3L</td>
</tr>
<tr>
<td>Speed</td>
<td>1600 MHz</td>
</tr>
<tr>
<td>Connectors</td>
<td>Four UDIMM slots</td>
</tr>
<tr>
<td>Memory module capacity</td>
<td>4 GB and 8 GB</td>
</tr>
<tr>
<td>Minimum memory</td>
<td>4 GB</td>
</tr>
<tr>
<td>Maximum memory</td>
<td>16 GB</td>
</tr>
</tbody>
</table>

NOTE: Each UDIMM slot supports a minimum of 4 GB and a maximum of 8 GB.

Table 8. Video

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated</td>
<td>Intel HD Graphics 530 / 510</td>
</tr>
<tr>
<td>Discrete</td>
<td>PCI Express x16 graphics adapter</td>
</tr>
</tbody>
</table>

Table 9. Audio

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated</td>
<td>Two channel High Definition Audio</td>
</tr>
</tbody>
</table>
### Table 10. Network

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated</td>
<td>Intel 219–V Ethernet capable of 10/100/1000 Mb/s communication</td>
</tr>
</tbody>
</table>

### Table 11. System information

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>System chipset</td>
<td>Intel 100 series, Q170</td>
</tr>
<tr>
<td>Interrupt levels</td>
<td>Integrated I/O APIC capability with 24 interrupts</td>
</tr>
<tr>
<td>BIOS chip (NVRAM)</td>
<td>16 MB</td>
</tr>
</tbody>
</table>

### Table 12. Expansion bus

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus type</td>
<td>PCIe gen3, USB 2.0, and USB 3.0</td>
</tr>
<tr>
<td>Bus speed</td>
<td>PCI Express:</td>
</tr>
<tr>
<td></td>
<td>• x1 slot each direction speed– up to 985 MB/s</td>
</tr>
<tr>
<td></td>
<td>• x4 slot each direction speed– up to 3.94 GB/s</td>
</tr>
<tr>
<td></td>
<td>• x16-slot each direction speed–16 GB/s</td>
</tr>
<tr>
<td></td>
<td>SATA: 1.5 Gbps, 3.0 Gbps, and 6 Gbps</td>
</tr>
</tbody>
</table>

### Table 13. Cards

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI</td>
<td>One full-height card</td>
</tr>
<tr>
<td>PCI Express x1</td>
<td>One full-height card</td>
</tr>
<tr>
<td>PCI Express x16</td>
<td>Up to two full-height cards</td>
</tr>
</tbody>
</table>

### Table 14. Drives

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Externally accessible (5.25-inch drive bays)</td>
<td>Two</td>
</tr>
</tbody>
</table>

### Table 15. External connectors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td></td>
</tr>
<tr>
<td>Front panel</td>
<td>Universal Audio Jack</td>
</tr>
<tr>
<td>Back panel</td>
<td>Line-out connector</td>
</tr>
<tr>
<td>Network adapter</td>
<td>RJ–45 connector</td>
</tr>
<tr>
<td>Serial</td>
<td>9-pin connector; 16550 C compatible</td>
</tr>
<tr>
<td>Parallel</td>
<td>25-pin connector (optional)</td>
</tr>
<tr>
<td>USB 2.0</td>
<td>• Front panel: two</td>
</tr>
<tr>
<td>Feature</td>
<td>Specification</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>USB 3.0</td>
<td>• Back panel: two</td>
</tr>
<tr>
<td></td>
<td>• Front panel: two</td>
</tr>
<tr>
<td></td>
<td>• Back panel: four</td>
</tr>
<tr>
<td></td>
<td>Video</td>
</tr>
<tr>
<td></td>
<td>• 19-pin HDMI connector</td>
</tr>
<tr>
<td></td>
<td>• Two 20-pin DisplayPort connectors</td>
</tr>
<tr>
<td></td>
<td>• 15-pin VGA connector (optional)</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Available video connectors may vary based on the graphics card selected.</td>
</tr>
<tr>
<td>Keyboard and mouse</td>
<td>Back panel:</td>
</tr>
<tr>
<td></td>
<td>• PS2 Keyboard 6-pin connector</td>
</tr>
<tr>
<td></td>
<td>• PS2 Mouse 6-pin connector</td>
</tr>
</tbody>
</table>

**Table 16. Internal connectors**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI 2.3 data width (maximum) — 32 bits</td>
<td>120-pin connector</td>
</tr>
<tr>
<td>PCI Express x1 data width (maximum) — one PCI Express lane</td>
<td>36-pin connector</td>
</tr>
<tr>
<td>PCI Express x16 (wired as x4) data width (maximum) — four PCI Express lanes</td>
<td>164-pin connector</td>
</tr>
<tr>
<td>PCI Express x16 data width (maximum) — 16 PCI Express lanes</td>
<td>164-pin connector</td>
</tr>
<tr>
<td>Serial ATA</td>
<td>Four Four 7-pin connectors</td>
</tr>
<tr>
<td>Memory</td>
<td>Four 240-pin connectors</td>
</tr>
<tr>
<td>Internal USB</td>
<td>10-pin connector</td>
</tr>
<tr>
<td>System Fan</td>
<td>4-pin connector</td>
</tr>
<tr>
<td>SSD</td>
<td>M.2 22x80 socket3</td>
</tr>
<tr>
<td>Front panel control</td>
<td>5-pin connector</td>
</tr>
<tr>
<td>Processor</td>
<td>1151-pin connector</td>
</tr>
<tr>
<td>Processor Fan</td>
<td>4-pin connector</td>
</tr>
<tr>
<td>Service mode jumper</td>
<td>2-pin connector</td>
</tr>
<tr>
<td>Password clear jumper</td>
<td>2-pin connector</td>
</tr>
<tr>
<td>RTC reset jumper</td>
<td>2-pin connector</td>
</tr>
<tr>
<td>Internal speaker</td>
<td>4-pin connector</td>
</tr>
<tr>
<td>Intruder connector</td>
<td>3-pin connector</td>
</tr>
<tr>
<td>Power connector</td>
<td>One 8-pin(for PSU), one 4-pin(for CPU), one 8-pin for SATA power</td>
</tr>
</tbody>
</table>
### Table 17. Controls and lights

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front of the computer</td>
<td></td>
</tr>
<tr>
<td>Power button light</td>
<td>White light — Solid white light indicates power-on state; blinking white light indicates sleep state of the computer.</td>
</tr>
<tr>
<td>Drive activity light</td>
<td>White light — Blinking white light indicates that the computer is reading data from or writing data to the hard drive.</td>
</tr>
<tr>
<td>Back of the computer</td>
<td></td>
</tr>
<tr>
<td>Link integrity light on integrated network</td>
<td>• Green — a 10 Mbps connection exists between the network and the computer.</td>
</tr>
<tr>
<td>adapter</td>
<td>• Green — a 100 Mbps connection exists between the network and the computer.</td>
</tr>
<tr>
<td></td>
<td>• Orange — a 1000 Mbps connection exists between the network and the computer.</td>
</tr>
<tr>
<td></td>
<td>• Off (no light) — the computer is not detecting a physical connection to the network.</td>
</tr>
<tr>
<td>Network activity light on integrated network</td>
<td>Yellow light — A blinking yellow light indicates that network activity is present.</td>
</tr>
<tr>
<td>Power supply diagnostic light</td>
<td>Green light — The power supply is turned on and is functional. The power cable must be connected to the power connector (at the back of the computer) and the electrical outlet.</td>
</tr>
</tbody>
</table>

### Table 18. Power

**NOTE:** Heat dissipation is calculated by using the power supply wattage rating.

<table>
<thead>
<tr>
<th>Power</th>
<th>Wattage</th>
<th>Maximum Heat Dissipation</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240 W</td>
<td>819.00 BTU/hr</td>
<td>100 VAC to 240 VAC, 50 Hz to 60 Hz, 4A/2A</td>
</tr>
<tr>
<td>Coin cell battery</td>
<td></td>
<td></td>
<td>3 V CR2032 lithium coin cell</td>
</tr>
</tbody>
</table>

### Table 19. Physical dimension

<table>
<thead>
<tr>
<th>Physical Dimensions</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>350.00 mm (13.77 inches)</td>
</tr>
<tr>
<td>Width</td>
<td>154.00 mm (6.06 inches)</td>
</tr>
<tr>
<td>Depth</td>
<td>274.00 mm (10.78 inches)</td>
</tr>
<tr>
<td>Weight</td>
<td>8.00 kg (17.64 lb)</td>
</tr>
</tbody>
</table>

### Table 20. Environmental

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>5°C to 35°C (41°F to 95°F)</td>
</tr>
<tr>
<td>Storage</td>
<td>−40°C to 65°C (−40°F to 149°F)</td>
</tr>
<tr>
<td>Feature</td>
<td>Specification</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>Relative humidity (maximum)</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>20 percent to 80 percent (non-condensing)</td>
</tr>
<tr>
<td>Storage</td>
<td>5 percent to 95 percent (non-condensing)</td>
</tr>
<tr>
<td>Maximum vibration</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>0.26 Grms</td>
</tr>
<tr>
<td>Storage</td>
<td>2.20 Grms</td>
</tr>
<tr>
<td>Maximum shock</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>40 G</td>
</tr>
<tr>
<td>Storage</td>
<td>105 G</td>
</tr>
<tr>
<td>Altitude:</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>–15.2 m to 3048 m (–50 to 10,000 ft)</td>
</tr>
<tr>
<td>Storage</td>
<td>–15.20 m to 10,668 m (–50 ft to 35,000 ft)</td>
</tr>
<tr>
<td>Airborne contaminant level</td>
<td>G1 or lower as defined by ANSI/ISA-S71.04-1985</td>
</tr>
</tbody>
</table>
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.

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3. Verify your country or region in the Choose a Country/Region drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.