หมายเหตุ ข้อควรระวัง และคำเตือน

หมายเหตุ: 'หมายเหตุ' จะระบุข้อมูลที่สำคัญที่จะช่วยให้คุณใช้งานคอมพิวเตอร์ได้มีประสิทธิภาพยิ่งขึ้น

ข้อควรระวัง: 'ข้อควรระวัง' จะชี้แจงโอกาสเกิดความเสียหายแก่ฮาร์ดแวร์หรือการสูญหายของข้อมูลหากไม่ปฏิบัติตามคำแนะนำ

คำเตือน: 'คำเตือน' ใช้เพื่อแจ้งอันตรายที่อาจเกิดขึ้นกับสถานที่ การบาดเจ็บหรือการเสียชีวิต

ข้อมูลในเอกสารนี้อาจมีการเปลี่ยนแปลงโดยไม่แจ้งให้ทราบ

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ห้ามผลิตเอกสารข้อมูลทั้งหมดนี้โดยตรงหรือโดยไม่แจ้งให้ทราบ

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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 performed the steps in Working on Your Computer.
• You have read the safety information that shipped with your computer.
• A component can be replaced or--if purchased separately--installed by
performing the removal procedure in reverse order.

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

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

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

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

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

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

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

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

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

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

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

**CAUTION:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

11. Remove any installed ExpressCards or Smart Cards from the appropriate slots.

เครื่องมือที่แนะนำให้ใช้

ขั้นตอนต่าง ๆ ในเอกสารนี้อาจจำเป็นต้องใช้เครื่องมือต่อไปนี้:

• ไขควงปากแบนขนาดเล็ก
• ไขควงหัวแฉกเบอร์ 0
• ไขควงหัวแฉกเบอร์ 1
• แท่งพลาสติกขนาดเล็กสำหรับงัด
• ซีดีโปรแกรมอัพเดต BIOS

การปิดคอมพิวเตอร์

⚠️ ข้อควรระวัง: เพื่อป้องกันการสูญหายของข้อมูล ให้บันทึกและปิดไฟล์ทั้งหมดที่ปิดอยู่ และออกจากโปรแกรมต่าง ๆ ก่อนที่จะปิดคอมพิวเตอร์

1. ปิดระบบปฏิบัติการ

• สำหรับ Windows Vista:
  คลิก Start จากนั้นคลิกที่สัญลักษณ์ที่มุมล่างขวาของเมนู Start ตามภาพต่อไป จนถึงคลิกเลือก Shut Down

• สำหรับ Windows XP:
  คลิก Start → Turn Off Computer → Turn Off คอมพิวเตอร์จะปิดทำงานหลังจากระบบปฏิบัติการทำงานเสร็จสิ้น

2. ตรวจสอบว่าคอมพิวเตอร์และอุปกรณ์ทั้งหมดที่ต่อคอมพิวเตอร์แล้ว หากคอมพิวเตอร์และอุปกรณ์ต่อทั่วไปไม่ปิด การทำงานอัตโนมัติที่มีใน BIOS จะทำให้คอมพิวเตอร์ทำงานก่อน 4 วินาทีที่เพื่อปิดการทำงาน

หลังจากทำงานกันส่วนประกอบภายในของคอมพิวเตอร์

หลังจากที่คุณดำเนินการเปลี่ยนชิ้นส่วนใด ๆ เสร็จสิ้นแล้ว ตรวจสอบว่าคุณได้ต่ออุปกรณ์ต่อทั่วไป การ์ด และสายใด ๆ ให้เรียบร้อยก่อนที่จะเปิดเครื่องคอมพิวเตอร์ของคุณ

⚠️ ข้อควรระวัง: เพื่อป้องกันความเสี่ยงจากการเปลี่ยนชิ้นส่วน เลือกอุปกรณ์ต่อทั่วไปที่ใช้เดิมในคอมพิวเตอร์ที่มีรุ่นเดียวกันกับคอมพิวเตอร์เดิมที่เปิดใช้งาน

1. ต่ออุปกรณ์ต่อทั่วไป เช่น ExpressCard หรือ media base

2. เสียบสายโทรศัพท์หรือสายเครือข่ายเข้ากับคอมพิวเตอร์

⚠️ ข้อควรระวัง: สำหรับการเสียบสายเครือข่าย ให้เสียบสายเข้ากับอุปกรณ์เครือข่ายก่อน และล็อกสายมือด้านข้างเข้ากับคอมพิวเตอร์

3. ใส่แบตเตอรี่กลับเข้าที่

4. เสียบแปลงคอมพิวเตอร์และอุปกรณ์ต่าง ๆ ทั้งหมดที่ต่ออยู่กับคอมพิวเตอร์เข้ากับไฟฟ้า

5. เปิดคอมพิวเตอร์
Secure Digital (SD) Card

Removing The Secure Digital (SD) Card

1. Follow the procedures in *Before Working On Your Computer.*
2. Press in on the SD card to release it from the computer.
3. Grasp the SD card and pull out to release from the computer.

Installing The Secure Digital (SD) Card

1. Slide the SD card into its slot until it clicks into place.
2. Follow the procedures in *After working inside your computer.*
ExpressCard

Removing the ExpressCard

1. Follow the procedures in *Before Working On Your Computer.*
2. Press in on the ExpressCard to release it from the computer.
3. Slide the ExpressCard out of the computer.

Installing the ExpressCard

1. Slide the ExpressCard into its slot until it clicks into place.
2. Follow the procedures in *After Working Inside Your Computer.*
Modem Connector Plug

Removing The Modem Connector Plug

1. Follow the procedures in *Before Working On Your Computer.*
2. Insert a paper clip into the hole to pop out the modem connector plug.

![Modem Connector Plug](image)

Installing The Modem Connector Plug

1. Insert and push in the modem connector plug into the modem port.
2. Follow the procedures in *After Working Inside Your Computer.*
Removing The Battery

1. Follow the procedures in *Before Working On Your Computer*.
2. Slide the release latches to unlock the battery.
3. Rotate the outer edge of the battery upward and remove it from the computer.

Installing The Battery

1. Slide the battery into its slot until it clicks into place.
2. Follow the procedures in *After Working Inside Your Computer*. 
Removing The Subscriber Identity Module (SIM) Card

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Press in on the SIM card to release it from the computer.
4. Grasp the SIM card and pull out to release from the computer.

Installing The Subscriber Identity Module (SIM) Card

1. Slide the SIM card into its compartment.
2. Replace the *battery.*
3. Follow the procedures in *After Working Inside Your Computer.*
Removing The Hard Drive

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the screws that secure the hard drive to the computer.
4. Slide the hard drive out of the computer.
5. Remove the screw that secures the hard-drive caddy to the hard drive.
6. Pull and remove the hard-drive caddy away from the hard drive.
Installing The Hard Drive

1. Attach the hard-drive caddy to the hard drive.
2. Tighten the screws to secure the hard-drive caddy to the hard drive.
3. Slide the hard drive into the computer.
4. Replace and tighten the screws to secure the hard drive to the computer.
5. Install the battery.
6. Follow the procedures in After working inside your computer.
Removing The Optical Drive

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the battery.
3. Press and release the optical drive latch

4. Pull the optical drive out of the computer.

5. Pull the optical drive door from one side to release it.
6. Pull the other side of the optical drive door to release it completely from the optical drive.

7. Remove the screw that secures the drive latch to the optical drive.

8. Remove the drive latch from the optical drive.

9. Remove the screws that secures the drive latch bracket to the optical drive.
10. Remove the drive latch bracket from the optical drive.

Installing The Optical Drive

1. Replace the drive latch bracket on the optical drive.
2. Replace and tighten the screws to secure the drive latch bracket to the optical drive.
3. Replace the drive latch on the optical drive.
4. Replace the screw to secure the drive latch to the optical drive.
5. Push in the left side of the optical drive door till it clicks in place in the optical drive.
6. Push in the right side of the optical drive door.
7. Insert the optical drive into the computer.
8. Push in the eject handle on the optical drive till it clicks in place.
9. Install the battery.
10. Follow the procedures in After working inside your computer.
Base Cover

Removing The Base Cover

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the battery.
3. Remove the screws that secure the base cover to the computer.
4. Lift from the back of the computer and slide towards the front of the computer.
5. Remove the base cover from the computer.
Installing The Base Cover

1. Place the base cover to align the screw holes correctly with the computer.
2. Tighten the screws to secure the base cover to the computer.
3. Install the battery.
4. Follow the procedures in *After Working Inside Your Computer*. 
Memory

Removing The Memory

1. Follow the procedures in *Before Working On Your Computer*
2. Remove the *battery*.
3. Remove the *secure digital (SD) Card*.
4. Remove the *base cover*.
5. Pry the retention clips away from the memory module until it pops up.

6. Remove the memory module.
Installing The Memory

1. Insert the memory into the memory socket.
2. Press the clips to secure the memory module to the system board.
3. Install the base cover.
4. Install the secure digital (SD) Card.
5. Install the battery.
6. Follow the procedures in After Working Inside Your Computer.
Removing Bluetooth Card

1. Follow the procedures in *Before Working on Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Disconnect the Bluetooth cable from the system board.

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

6. Lift and remove the Bluetooth card from the computer.
7. Disconnect the Bluetooth cable from the Bluetooth card.

Installing The Bluetooth Card

1. Connect the Bluetooth cable to the Bluetooth card.
2. Connect the other end of the Bluetooth cable to the system board.
3. Place the Bluetooth card in its location in the computer.
4. Replace and tighten the screw to secure the Bluetooth card to the system board.
5. Install the base cover.
6. Install the battery.
7. Follow the procedures in After Working Inside Your Computer.
Coin-Cell Battery

Removing The Coin-Cell Battery

1. Follow the procedures in *Before Working on Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Disconnect the coin-cell battery cable from the system board.
5. Release and remove the coin-cell battery from the computer.

Installing The Coin-Cell Battery

1. Attach the coin-cell battery cable to its connector on the system board.
2. Attach the coin-cell battery to its compartment.
3. Install the *base cover.*
4. Install the *battery.*
5. Follow the procedures in *After working inside your computer.*
Modem Card

Removing The Modem Card

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Disconnect the connector that secures the modem card to the system board.
5. Remove the screw securing the modem to the system.
6. Lift and remove the modem card from the computer.
Installing The Modem Card

1. Fasten the connector attaching the modem card to the system board.
2. Insert the modem into its compartment and press on the module to connect it to the system board.
3. Connect the modem cable to the system board.
4. Tighten the screw to secure the modem card to the computer.
5. Install the base cover.
6. Install the battery.
7. Follow the procedures in After working inside your computer.
Removing The Modem Connector

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *secure digital (SD) Card.*
4. Remove the *base cover.*
5. Remove the *modem card.*
6. Disconnect the antenna cables.

7. Unthread the antenna cables from the route.

8. Unthread the modem cable.
9. Remove the screw that secures the modem connector bracket.

10. Remove the modem connector bracket.

11. Remove the modem connector.
Installing The Modem Connector

1. Align the modem connector to its original position.
2. Align the modem bracket to its original position.
3. Tighten the screw to secure the modem bracket.
4. Route and connect the modem cable.
5. Route and connect the antenna cables.
6. Install the *modem card*.
7. Install the *base cover*.
8. Install the *secure digital (SD) Card*.
9. Install the *battery*.
10. Follow the procedures in *After Working Inside Your Computer*. 
Wireless Local Area Network (WLAN) Card

Removing The Wireless Local Area Network (WLAN) Card

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Disconnect the antenna cables from the WLAN card.
5. Remove the screw that secures the WLAN card to the computer.
6. Remove the WLAN card from its slot on the system board.
Installing The Wireless Local Area Network (WLAN) Card

1. Insert the WLAN card into its connector at a 45–degree angle into its slot.
2. Connect the antenna cables to their respective connectors marked on the WLAN card.
3. Replace and tighten the screw to secure the WLAN card to the computer.
4. Install the *base cover*.
5. Install the *battery*.
6. Follow the procedures in *After Working Inside Your Computer*. 
Removing The Wireless Wide Area Network (WWAN) Card

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Disconnect the antenna cables from the WWAN card.
5. Remove the screw that secures the WWAN card to the computer.
6. Remove the WWAN card from the computer.
Installing The Wireless Wide Area Network (WWAN) Card

1. Insert the WWAN card into its connector at a 45–degree angle into its slot.
2. Connect the antenna cables to their respective connectors marked on the WWAN card.
3. Replace and tighten the screw to secure the WWAN card to the computer.
4. Install the base cover.
5. Install the battery.
6. Follow the procedures in After Working Inside Your Computer.
Removing The Power Connector

1. Follow the procedures in *Before Working on Your Computer*.
2. Remove the battery.
3. Remove the base cover.
4. Disconnect and remove the power connector cable from the route.
5. Remove the screw that secures the power connector bracket to the computer.
6. Remove the power connector port from the computer.
7. Remove the power connector trim.

Installing The Power Connector

1. Align the power connector port trim in its original position.
2. Tighten the screw to secure the power connector trim to the computer.
3. Insert the power connector in its compartment.
4. Install the power connector bracket in its place and tighten the screw to secure its position.
5. Connect the power connector to the system board.
6. Connect and route the power connector cable.
7. Remove the base cover.
8. Remove the battery.
Heat Sink

Removing The Heat-Sink

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the heat-sink cable from the system board.
5. Remove the screws that secure the heat-sink assembly to the system board.
6. Lift up to raise the right side of the heat-sink and slide the heat-sink sideways to remove from the system board.
Installing The Heat-Sink

1. Slide the heat-sink into its original position in the system board.
2. Tighten the screws to secure the heat-sink assembly to the system board.
3. Connect the heat-sink cable to the system board.
4. Install the base cover.
5. Install the battery.
6. Follow the procedures in After Working Inside Your Computer.
Processor

Removing The Processor

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Remove the *heat-sink.*
5. Rotate the processor cam lock in a counter-clockwise direction.
6. Lift up and remove the processor from the system board.
Installing The Processor

1. Align the notches on the processor and the socket.
2. Slide the processor into the socket.
3. Rotate the processor cam lock in a clockwise direction.
4. Install the heat-sink.
5. Install the base cover.
6. Install the battery.
7. Follow the procedures in After Working Inside Your Computer.
Removing The Keyboard Trim

1. Follow the procedures in *Before Working On Your Computer.*
2. Using a plastic scribe, pry under the keyboard trim to release it from the computer.
3. Lift the keyboard trim to release the tabs.
4. Pry up the keyboard trim from the bottom center.
5. Lift up to remove the keyboard trim from the computer.
Installing The Keyboard Trim

1. Align the keyboard trim to its compartment.
2. Press along the sides of the keyboard trim until it snaps in place.
3. Follow the procedures in *After Working Inside Your Computer.*
Removing The Keyboard

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *keyboard trim.*
3. Remove the *battery.*
4. Remove the *base cover.*
5. Remove the screws that secure the keyboard to the palm rest assembly
6. Flip the keyboard over.
7. Lift the clip to release the keyboard cable and disconnect it from the computer
8. Remove the keyboard from the system board.

9. Remove the tape that secures the keyboard cable from the keyboard.

10. Disconnect and remove the keyboard data cable from the keyboard.
Installing The Keyboard

1. Connect the keyboard cable and secure it to the keyboard using the tape.
2. Slide the keyboard into its compartment until all the metal tabs fit into their positions.
3. Press down on the keyboard to the left and right side ensuring that all the snaps are fully engaged with the computer.
4. Fasten the keyboard cable clip.
5. Replace and tighten the screws to secure the keyboard to the palm rest.
6. Install the base cover.
7. Install the battery.
8. Install the keyboard trim.
Palm Rest

Removing The Palm Rest Assembly

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Remove the *display assembly.*
5. Remove the *optical drive.*
6. Remove the *hard drive.*
7. Remove the *bluetooth.*
8. Remove the *keyboard trim.*
9. Remove the *keyboard.*
10. Remove the screws that secure the palm rest assembly to the computer.

11. Flip the computer and remove the screws from the system board.

12. Disconnect the following cables from the system board:
    - fingerprint sensor
• Radio Frequency Identification (RFID) sensor
• touch pad
• media board

13. Lift the palm rest at a 45-degree angle and remove it.

Installing The Palm Rest Assembly

1. Align the palm rest assembly to its original position in the computer and snap it into place.

2. Connect the following cables to the system board:
   • fingerprint sensor
   • Radio Frequency Identification (RFID) sensor
   • touch Pad
• media board

3. Replace and tighten the screws to secure the palm rest assembly to the computer.

4. Install the keyboard.

5. Install the keyboard trim.

6. Install the Bluetooth.

7. Install the hard drive.

8. Install the optical drive.

9. Install the display assembly.

10. Install the base cover.

11. Install the battery.

12. Follow the procedures in *After Working Inside Your Computer*. 
Smart Card Reader

Removing the Smart Card Reader

1. Follow the procedures in Before Working On Your Computer.
2. Remove the battery.
3. Remove the base cover.
4. Remove the display assembly.
5. Remove the optical drive.
6. Remove the hard drive.
7. Remove the bluetooth module.
8. Remove the keyboard trim.
9. Remove the keyboard.
10. Remove the palm rest assembly.
11. Disconnect the smart card reader cable from the system board.

12. Remove screws from the smart card reader.

13. Remove the smart card reader from the computer.
Installing The Smart Card Reader

1. Insert the smart card reader in the computer in its original position.
2. Tighten the screws of the smart card reader.
3. Connect the smart card reader cable to the system board.
4. Install the palm rest assembly.
5. Install the keyboard.
6. Install the keyboard trim.
7. Install the bluetooth module.
8. Install the hard drive.
9. Install the optical drive.
10. Install the display assembly.
11. Install the base cover.
12. Install the battery.
13. Follow the procedures in After Working Inside Your Computer.
ExpressCard Cage

Removing The ExpressCard Cage

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *ExpressCard.*
4. Remove the *optical drive.*
5. Remove the *base cover.*
6. Remove the *hard drive.*
7. Remove the *bluetooth.*
8. Remove the *keyboard trim.*
9. Remove the *keyboard.*
10. Remove the *palm rest assembly.*
11. Remove the *display assembly.*
12. Remove the screws securing the ExpressCard cage to the computer.
13. Lift and remove the ExpressCard cage from the computer.
Installing The ExpressCard Cage

1. Insert the ExpressCard cage into its original position.
2. Replace and tighten the screws to secure the ExpressCard cage to the computer.
3. Install the display assembly.
4. Install the palm rest assembly.
5. Install the keyboard.
6. Install the keyboard trim.
7. Install the Bluetooth.
8. Install the hard drive.
9. Install the base cover.
10. Install the optical drive.
11. Install the ExpressCard.
12. Install the battery.
13. Follow the procedures in After working inside your computer.
Wireless Switch Board

Removing The Wireless Switch Board

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *base cover.*
4. Remove the *display assembly.*
5. Remove the *optical drive.*
6. Remove the *hard drive.*
7. Remove the *Bluetooth.*
8. Remove the *keyboard trim.*
9. Remove the *keyboard.*
10. Remove the *palm rest assembly.*
11. Remove the wireless switch cable from the system board.
12. Remove the screw from the system board.
13. Remove the wireless switch board from the computer.
Installing The Wireless Switch Board

1. Align the wireless switch board into its original position in the computer.
2. Tighten the screw on the board.
3. Route and connect the wireless switch cable in the system board.
4. Install the palm rest assembly.
5. Install the keyboard.
6. Install the keyboard trim.
7. Install the bluetooth.
8. Install the hard drive.
9. Install the optical drive.
10. Install the display assembly.
11. Install the base cover.
12. Install the battery.
13. Follow the procedures in *After Working Inside Your Computer.*
Removing The System Board

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *secure digital (SD) Card.*
3. Remove the *ExpressCard.*
4. Remove the *battery.*
5. Remove the *base cover.*
6. Remove the *display assembly.*
7. Remove the *optical drive.*
8. Remove the *hard drive.*
9. Remove the *wireless local area network (WLAN) card.*
10. Remove the *wireless wide area network (WWAN) card.*
11. Remove the *heat-sink.*
12. Remove the *processor.*
13. Remove the *memory.*
14. Remove the *Bluetooth.*
15. Remove the *modem card.*
16. Remove the *keyboard trim.*
17. Remove the *keyboard.*
18. Remove the *palm rest assembly.*
19. Remove the *ExpressCard cage.*
20. Disconnect and release coin-cell battery cable and the power connector cable from the system board.
21. Remove the two screws securing the LVDS bracket.

22. Remove the LVDS bracket.

23. Disconnect the following cables from the system board:
   - LVDS
   - camera/microphone
   - touch screen (if applicable)
24. Flip the computer and disconnect the following cables from the system board:
   - wireless switch board
   - smart card reader
   - speaker

25. Remove the screws from the system board.

26. Detach the top left edge of the system board from the I/O board connector.
27. Lift and slide the system board out of the computer.

Installing The System Board

1. Align the system board into its original position on the computer.
2. Replace and tighten the screws to secure the system board to the computer.
3. Route and connect the following cables to the system board:
   - LVDS
   - camera/microphone
   - touchscreen (if applicable)
   - speaker
   - wireless switch board
   - smart card reader
   - coin-cell battery
- power connector

4. Install the LVDS bracket and tighten the screws to secure it in place.

5. Install the *ExpressCard Cage.*

6. Install the *palm rest assembly.*

7. Install the *keyboard.*

8. Install the *keyboard trim.*

9. Install the *modem card.*

10. Install the *Bluetooth.*

11. Install the *memory.*

12. Install the *processor.*

13. Install the *heat-sink.*

14. Install the *wireless wide area network (WWAN) card.*

15. Install the *wireless local area network (WLAN) card.*

16. Install the *hard drive.*

17. Install the *optical drive.*

18. Install the *display assembly.*

19. Install the *base cover.*

20. Install the *battery.*

21. Install the *ExpressCard.*

22. Install the *secure digital (SD) Card.*

23. Follow the procedures in *After Working Inside Your Computer.*
Removing The Speakers

1. Follow the procedures in Before Working On Your Computer.
2. Remove the secure digital (SD) Card.
3. Remove the ExpressCard.
4. Remove the battery.
5. Remove the base cover.
6. Remove the display assembly.
7. Remove the optical drive.
8. Remove the hard drive.
9. Remove the wireless local area network (WLAN) card.
10. Remove the wireless wide area network (WWAN) card.
11. Remove the heat-sink.
12. Remove the processor.
13. Remove the memory.
14. Remove the bluetooth.
15. Remove the modem card.
16. Remove the keyboard trim.
17. Remove the keyboard.
18. Remove the palm rest assembly.
20. Remove the system board.
21. Remove the screw that secures the hard drive support plate to the computer.
22. Slide and remove the hard drive support plate.

23. Remove the screws that secures the speakers.

24. Unthread the speaker cables and remove the speakers.
Installing The Speakers

1. Align the speakers in the original position and connect the speaker cables.
2. Tighten the screws to secure the speakers.
3. Slide the hard drive support plate into its position.
4. Tighten the screw to secure the hard drive support plate to the computer.
5. Install the *system board*.
6. Install the *ExpressCard Cage*.
7. Install the *palm rest assembly*.
8. Install the *keyboard*.
9. Install the *keyboard trim*.
10. Install the *modem card*.
11. Install the *Bluetooth*.
12. Install the *memory*.
13. Install the *processor*.
14. Install the *heat sink*.
15. Install the *wireless wide area network (WWAN) card*.
16. Install the *wireless local area network (WLAN) card*.
17. Install the *hard drive*.
18. Install the *optical drive*.
19. Install the *display assembly*.
20. Remove the *base cover*.
21. Remove the *battery*.
22. Install the *ExpressCard*.
23. Remove the *secure digital (SD) Card*.
24. Follow the procedures in *After working inside your computer*.
Removing The Input/Output (I/O) Panel

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *secure digital (SD) Card*.
3. Remove the *ExpressCard*.
4. Remove the *battery*.
5. Remove the *base cover*.
6. Remove the *display assembly*.
7. Remove the *optical drive*.
8. Remove the *hard drive*.
9. Remove the *wireless local area network (WLAN) card*.
10. Remove the *wireless wide area network (WWAN) card*.
11. Remove the *heat-sink*.
12. Remove the *processor*.
13. Remove the *memory*.
14. Remove the *Bluetooth*.
15. Remove the *modem card*.
16. Remove the *modem connector*.
17. Remove the *keyboard trim*.
18. Remove the *keyboard*.
19. Remove the *palm rest assembly*.
20. Remove the *smart card reader*.
21. Remove the *ExpressCard cage*.
22. Remove the *system board*.
23. Remove the screw that secures the I/O panel to the computer.
24. Lift the I/O panel at a 45-degree angle and remove it from the computer.
Installing The Input/Output (I/O) Panel

1. Slide in the I/O panel at a 45 degree angle into its original position in the computer.
2. Tighten the screw securing the I/O panel to the computer.
3. Install the system board.
4. Install the ExpressCard Cage.
5. Install the smart card reader.
6. Install the palm rest assembly.
7. Install the keyboard.
8. Install the keyboard trim.
9. Install the modem connector.
10. Install the modem card.
11. Install the bluetooth.
12. Install the memory.
13. Install the processor.
15. Install the wireless wide area network (WWAN) card.
16. Install the wireless local area network (WLAN) card.
17. Install the hard drive.
18. Install the optical drive.
19. Install the display assembly.
20. Install the base cover.
21. Install the battery.
22. Install the ExpressCard.
23. Install the secure digital (SD) Card.
24. Follow the procedures in After Working Inside Your Computer.
Display Assembly

Removing The Display Assembly

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the battery.
3. Remove the base cover.
4. Release the antenna cables from the computer.
5. Remove the screws that secures the low-voltage differential signaling (LVDS) support bracket.
6. Lift up and remove the LVDS support bracket.
7. Disconnect the following cables from the system board:
   - LVDS
   - camera
   - touch screen

8. Unthread the cables.

9. Remove the screws that secures the display assembly to the computer.
10. Lift up the computer base from the display assembly to release the LVDS cable and antenna cables from the computer.

11. Remove the computer by disengaging it from the system assembly.
Installing The Display Assembly

1. Insert the low-voltage differential signaling (LVDS) cable and wireless antenna cables through the holes on the bottom base chassis.
2. Attach the display assembly hinges to the bottom base chassis.
3. Replace and tighten the screws to secure the display assembly to the computer.
4. Route the LVDS cable along its compartment and connect the connector to the system board.
5. Install the LVDS bracket.
6. Tighten the screws to secure the bracket in place.
7. Route the Wireless Local Area Network (WLAN) and/or Wireless Wide Area Network (WWAN) antennae along their compartments and connect the antennae to the WLAN and/or WWAN module.
8. Install the base cover.
9. Install the battery.
10. Follow the procedures in After Working Inside Your Computer.
Display Bezel

Removing The Display Bezel

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Pry the display bezel from inside the display assembly.
4. Remove the display bezel.

Installing The Display Bezel

1. Place the display bezel onto the display assembly.
2. Starting from the top corner, press on the display bezel and work around the entire bezel until it snaps onto the display assembly.
3. Press on the left and right edges of the display bezel.
4. Install the *battery.*
5. Follow the procedures in *After Working Inside Your Computer.*
Display Panel

Removing The Display Panel

1. Follow the procedures in *Before Working On Your Computer.*
2. Remove the *battery.*
3. Remove the *display bezel.*
4. Remove the screws that secures the display panel to the computer.
5. Flip the display panel over the keyboard.
6. Peel the tape from the low-voltage differential signaling (LVSD) cable connector.
7. Disconnect the LVSD cable from the display panel.

8. Remove the display panel from the computer.

Installing The Display Panel

1. Align the display panel in its original position in the computer.
2. Connect the low-voltage differential signaling (LVSD) cable to the display panel and attach the tape.
3. Tighten the screws securing the display panel to the computer.
4. Install the battery.
5. Install the display bezel.
6. Follow the procedures in After working inside your computer.
Removing The Camera

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *display bezel*.
4. Loosen the screw that secures the camera module.
5. Disconnect the cable and remove the camera module.

Installing The Camera

1. Replace the camera module in position and connect the cable.
2. Tighten the screw to secure the camera module.
3. Install the *display bezel*.
4. Install the *battery*.
5. Follow the procedures in *After working inside your computer*.
Technical Specifications

NOTE: ข้อมูลที่ให้มากับข้อมูลแต่งกันไปแล้วที่นี้ รายละเอียดทางเทคนิคต่อไปนี้เป็นส่วนที่อยู่ภายใต้เงื่อนไขของกฎหมายสำหรับจัดส่งคอมพิวเตอร์ของคุณ ศูนย์ความช่วยเหลือเพิ่มเติมเกี่ยวกับคอมพิวเตอร์ของคุณโดยคลิก Start → Help and Support จากนั้นเลือกลำดับเลือกที่ต้องการเกี่ยวกับคอมพิวเตอร์ของคุณ

System Information

<table>
<thead>
<tr>
<th>System Information</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipset</td>
<td>Intel Mobile Express Series 6 chipset</td>
</tr>
<tr>
<td>DRAM bus width</td>
<td>64-bit</td>
</tr>
<tr>
<td>Flash EPROM</td>
<td>SPI 32 Mbits</td>
</tr>
<tr>
<td>PCIe Gen1 bus</td>
<td>100 MHz</td>
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</tbody>
</table>

Processor

<table>
<thead>
<tr>
<th>Types</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel Core i3 series</td>
<td></td>
</tr>
<tr>
<td>Intel Core i5 series with Turbo BoostTechnology 2.0</td>
<td></td>
</tr>
<tr>
<td>Intel Core i7 series with Turbo BoostTechnology 2.0</td>
<td></td>
</tr>
<tr>
<td>L2 cache</td>
<td>up to 6 MB</td>
</tr>
<tr>
<td>External bus frequency</td>
<td>1333 MHz</td>
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</table>

Memory

<table>
<thead>
<tr>
<th>Memory</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory connector</td>
<td>two SODIMM slots</td>
</tr>
<tr>
<td>Memory capacity</td>
<td>1 GB, 2 GB, or 4 GB</td>
</tr>
<tr>
<td>Memory type</td>
<td>DDR3 SDRAM (1333 MHz)</td>
</tr>
<tr>
<td>Minimum memory</td>
<td>2 GB</td>
</tr>
<tr>
<td>Maximum memory</td>
<td>8 GB</td>
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</table>
## Audio

<table>
<thead>
<tr>
<th>Type</th>
<th>four-channel high definition audio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller</td>
<td>IDT 92HD90</td>
</tr>
<tr>
<td>Stereo conversion</td>
<td>24-bit (analog-to-digital and digital-to-analog)</td>
</tr>
<tr>
<td>Interface:</td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>high definition audio</td>
</tr>
<tr>
<td>External</td>
<td>microphone-in/stereo headphones/external speakers connector</td>
</tr>
<tr>
<td>Speakers</td>
<td>two</td>
</tr>
<tr>
<td>Internal speaker amplifier</td>
<td>0.5 W (typical) per channel</td>
</tr>
<tr>
<td>Volume controls</td>
<td>keyboard function keys and program menus</td>
</tr>
</tbody>
</table>

## Video

<table>
<thead>
<tr>
<th>Video type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• integrated on system board</td>
<td></td>
</tr>
<tr>
<td>• discrete</td>
<td></td>
</tr>
<tr>
<td>Data bus:</td>
<td></td>
</tr>
<tr>
<td>UMA</td>
<td>integrated video</td>
</tr>
<tr>
<td>Discrete</td>
<td></td>
</tr>
<tr>
<td>• PCI-E x16 Gen1</td>
<td></td>
</tr>
<tr>
<td>• PCI-E x16 Gen2</td>
<td></td>
</tr>
<tr>
<td>Video controller:</td>
<td></td>
</tr>
<tr>
<td>UMA</td>
<td>Intel HD Graphics</td>
</tr>
<tr>
<td>Discrete</td>
<td>NVIDIA NVS 4200M Discrete Graphics (512 MB DDR3)</td>
</tr>
</tbody>
</table>

## Communications

| Network adapter | 10/100/1000 Mbps Ethernet LAN |
| Wireless | internal wireless local area network (WLAN) and wireless wide area network (WWAN) |
### Ports and Connectors

**Audio**
- one microphone connector/stereo headphone/speakers connector

**Video**
- one 15-pin VGA connector
- one 19-pin HDMI connector

**Network adapter**
- one RJ-45 connector

**USB**
- three 4-pin USB 2.0-compliant connectors and one eSATA/USB 2.0-compliant connector

**Memory card reader**
- one 5-in-1 memory card reader

**IEEE 1394:**
- one 4-pin connector

### Contactless Smart Card

**Supported Smart Cards/Technologies**
- ISO14443A — 106 kbps, 212 kbps, 424 kbps, and 848 kbps
- ISO14443B — 106 kbps, 212 kbps, 424 kbps, and 848 kbps
- ISO15693
- HID iClass
- FIPS201
- NXP Desfire

### Display

**Type**
- WLED display

**Size**
- 15.6 inch high definition (HD)

**Dimensions:**
- Height: 210.00 mm (8.26 inches)
- Width: 360.00 mm (14.17 inches)
- Diagonal: 396.24 mm (15.60 inches)
- Active area (X/Y): 344.23 mm x 193.54 mm
- Maximum resolution: 1366 x 768 pixels at 262K colors
- Maximum Brightness: 220 nits
- Operating angle: 0° (closed) to 135°
- Refresh rate: 60 Hz

**Minimum Viewing angles:**
### Display

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>+/- 60°</td>
</tr>
<tr>
<td>Vertical</td>
<td>+/- 50°</td>
</tr>
<tr>
<td>Pixel pitch</td>
<td>0.252 mm</td>
</tr>
</tbody>
</table>

### Keyboard

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of keys:</td>
<td>United States: 101 keys United Kingdom: 102 keys Brazil: 104 keys Japan: 105 keys</td>
</tr>
<tr>
<td>Layout</td>
<td>QWERTY/AZERTY/Kanji</td>
</tr>
</tbody>
</table>

### Touchpad

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Area:</td>
<td></td>
</tr>
<tr>
<td>X-axis</td>
<td>80.00 mm</td>
</tr>
<tr>
<td>Y-axis</td>
<td>40.70 mm</td>
</tr>
</tbody>
</table>

### Battery

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
</table>
| Type    | • 4-cell "smart" lithium ion  
          • 6-cell "smart" lithium ion  
          • 9-cell "smart" lithium ion |
| Dimensions: |                      |
| 4-cell and 6-cell |                          |
| Depth        | 48.08 mm (1.90 inches) |
| Height       | 20.00 mm (0.79 inches) |
| Width        | 208.00 mm (8.19 inches) |
| 9-cell       |                          |
| Depth        | 71.79 mm (2.83 inches)  |
| Height       | 20.00 mm (0.79 inches)  |
| Width        | 214.00 mm (8.43 inches) |
| Weight:      |               |
## Battery

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4-cell</td>
<td>240.00 g</td>
<td>(0.53 lb)</td>
</tr>
<tr>
<td>6-cell</td>
<td>345.00 g</td>
<td>(0.76 lb)</td>
</tr>
<tr>
<td>9-cell</td>
<td>524.00 g</td>
<td>(1.16 lb)</td>
</tr>
</tbody>
</table>

Charge time for a 4-cell and 6-cell battery with computer off (with 90 W adapter) approximately 1 hour to 80% capacity and 2 hours to 100% capacity.

### Voltage

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4-cell</td>
<td>14.80 VDC</td>
</tr>
<tr>
<td>6-cell and 9-cell</td>
<td>11.10 VDC</td>
</tr>
</tbody>
</table>

Temperature range:

- **Operating**: 0 °C to 35 °C (32 °F to 95 °F)
- **Non-Operating**: −40 °C to 65 °C (−40 °F to 149 °F)

### Coin-cell battery

3 V CR2032 lithium coin cell

## AC Adapter

<table>
<thead>
<tr>
<th></th>
<th>65 W, 90 W, and 150 W</th>
</tr>
</thead>
</table>

**NOTE**: 65 W AC adapter is available only for computers with integrated video card.

- **Input voltage**: 100 VAC to 240 VAC
- **Input current (maximum)**: 1.50 A/1.60 A/1.70 A/2.10 A
- **Input frequency**: 50 Hz to 60 Hz
- **Output power**: 65 W, 90 W, and 150 W
- **Output current**: 3.34 A, 4.62 A and 7.70 A (continuous)
- **Rated output voltage**: 19.5 +/- 1.0 VDC

Temperature range:

- **Operating**: 0 °C to 40 °C (32 °F to 104 °F)
- **Non-Operating**: −40 °C to 70 °C (−40 °F to 158 °F)
## Physical

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>28.30 mm to 34.20 mm (1.11 inches to 1.35 inches)</td>
</tr>
<tr>
<td>Width</td>
<td>384.00 mm (15.11 inches)</td>
</tr>
<tr>
<td>Depth</td>
<td>258.00 mm (10.16 inches)</td>
</tr>
<tr>
<td>Weight (with 4-cell battery)</td>
<td>2.50 kg (5.51 lb)</td>
</tr>
</tbody>
</table>

## Environmental

<table>
<thead>
<tr>
<th>Property</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature:</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>0 °C to 35 °C (32 °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>Relative humidity (maximum):</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>10 % to 90 % (noncondensing)</td>
</tr>
<tr>
<td>Storage</td>
<td>5 % to 95 % (noncondensing)</td>
</tr>
<tr>
<td>Altitude (maximum):</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>−15.2 m to 3048 m (−50 ft to 10,000 ft)</td>
</tr>
<tr>
<td>Non-Operating</td>
<td>−15.2 m to 10,668 m (−50 ft to 35,000 ft)</td>
</tr>
<tr>
<td>Airborne contaminant level</td>
<td>G1 as defined by ISA-71.04–1985</td>
</tr>
</tbody>
</table>
System Setup

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.

Entering System Setup

1. Turn on (or restart) your computer.

2. When the blue DELL logo is displayed, you must watch for the F2 prompt to appear.

3. Once the F2 prompt appears, press <F2> immediately.

⚠️ NOTE: The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it to display, and then press <F2>. If you press <F2> before you are prompted, this keystroke will be lost.

4. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, shut down your computer and try again.

System Setup Menu Options

The following sections describe the menu options for the System Setup program.

General

The following table describes the menu options of the General menu.
### Option | Description
--- | ---
System Information | This section lists the primary hardware features of your computer.  
- System Information  
- Memory Information  
- Processor Information  
- Device Information
Battery Information | Displays the battery status and the type of AC adapter connected to the computer.
Boot Sequence | Allows you to change the order in which the computer attempts to find an operating system.  
- Diskette Drive  
- Internal HDD  
- USB Storage Device  
- CD/DVD/CD-RW Drive  
- Onboard NIC  
- Cardbus NIC
You can also choose the Boot List option. The options are:
- Legacy  
- UEFI
Date/Time | Allows you to change the date and time.

### System Configuration
The following table describe the menu options of the System Configuration menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>

**NOTE:** System Configuration contains options and settings related to integrated system devices. Depending on your computer and installed devices, the items listed in this section may or may not appear.

Integrated NIC | Allows you to configure the integrated network controller. The options are:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Management</td>
<td>Allows you to control the systems management mechanism. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• DASH/ASF 2.0</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>DASH/ASF 2.0</strong></td>
</tr>
<tr>
<td>Parallel Port</td>
<td>Allows you to configure the parallel port on the docking station. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• AT</td>
</tr>
<tr>
<td></td>
<td>• PS2</td>
</tr>
<tr>
<td></td>
<td>• ECP</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>AT</strong></td>
</tr>
<tr>
<td>Serial Port</td>
<td>Allows you to configure the integrated serial port. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• COM1</td>
</tr>
<tr>
<td></td>
<td>• COM2</td>
</tr>
<tr>
<td></td>
<td>• COM3</td>
</tr>
<tr>
<td></td>
<td>• COM4</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>COM1</strong></td>
</tr>
<tr>
<td>SATA Operation</td>
<td>Allows you to configure the internal SATA hard-drive controller. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• ATA</td>
</tr>
<tr>
<td></td>
<td>• AHCI</td>
</tr>
<tr>
<td></td>
<td>• RAID On</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>RAID On</strong></td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NOTE:</td>
<td>SATA is configured to support RAID mode.</td>
</tr>
<tr>
<td>USB Controller</td>
<td>Allows you to control the USB controller. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Enable Boot Support</td>
</tr>
<tr>
<td></td>
<td>• Enable External USB Port</td>
</tr>
<tr>
<td>Default Setting</td>
<td>Enable USB Controller and Enable External USB Port</td>
</tr>
<tr>
<td>Miscellaneous Devices</td>
<td>Allows you to enable or disable the following devices:</td>
</tr>
<tr>
<td></td>
<td>• Internal Modem</td>
</tr>
<tr>
<td></td>
<td>• Microphone</td>
</tr>
<tr>
<td></td>
<td>• eSATA Ports</td>
</tr>
<tr>
<td></td>
<td>• Hard Drive Free Fall Protection</td>
</tr>
<tr>
<td></td>
<td>• Module Bay</td>
</tr>
<tr>
<td></td>
<td>• ExpressCard</td>
</tr>
<tr>
<td></td>
<td>• Camera</td>
</tr>
<tr>
<td></td>
<td>You can also enable or disable:</td>
</tr>
<tr>
<td></td>
<td>• Media Card and 1394</td>
</tr>
<tr>
<td></td>
<td>• Enable Media Card only</td>
</tr>
<tr>
<td></td>
<td>• Disable Media Card and 1394</td>
</tr>
<tr>
<td>Default Setting</td>
<td>Media Card and 1394</td>
</tr>
<tr>
<td>Keyboard illumination</td>
<td>Allows you to configure the keyboard illumination feature. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• Level is 25%</td>
</tr>
<tr>
<td></td>
<td>• Level is 50%</td>
</tr>
<tr>
<td></td>
<td>• Level is 75%</td>
</tr>
<tr>
<td></td>
<td>• Levels is 100%</td>
</tr>
<tr>
<td>Default Setting</td>
<td>Level is 25%</td>
</tr>
<tr>
<td>Drives</td>
<td>Allows you to configure the SATA drives on board. The options are:</td>
</tr>
</tbody>
</table>
Option | Description
--- | ---
• SATA-0 |  
• SATA-1 |  
• SATA-4 |  
• SATA-5 |  

Default Setting: All drives are enabled.

**Video**
The following table describe the menu options of the Video menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD Brightness</td>
<td>Allows you to set the display brightness depending up on the power source (On Battery and On AC).</td>
</tr>
<tr>
<td>Enable Optimus</td>
<td>This option enables or disables the Nvidia Optimus Technology applicable to Windows 7 only.</td>
</tr>
</tbody>
</table>

**Security**
The following table describe the menu options of the Security menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Password</td>
<td>Allows you to set, change, or delete the administrator (admin) password.</td>
</tr>
</tbody>
</table>

⚠️ **NOTE:** You must set the admin password before you set the system or hard drive password.

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

⚠️ **NOTE:** Deleting the admin password automatically deletes the system password and the hard drive password.

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

Default Setting: **Not set**
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Password</td>
<td>Allows you to set, change or delete the system password.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Successful password changes take effect immediately.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: Not set</td>
</tr>
<tr>
<td>Internal HDD-0 Password</td>
<td>Allows you to set or change the system's internal hard-disk drive.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Successful password changes take effect immediately.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: Not set</td>
</tr>
<tr>
<td>Password Bypass</td>
<td>Allows you to enable or disable the permission to bypass the System and the Internal HDD password, when they are set. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• Reboot bypass</td>
</tr>
<tr>
<td></td>
<td>Default Setting: Disabled</td>
</tr>
<tr>
<td>Password Change</td>
<td>Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: Allow Non-Admin Password Changes is selected</td>
</tr>
<tr>
<td>Strong Password</td>
<td>Allows you to enforce the option to always set strong passwords.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: Disabled</td>
</tr>
<tr>
<td>OROM Keyboard Access</td>
<td>Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Enable</td>
</tr>
<tr>
<td></td>
<td>• One Time Enable</td>
</tr>
<tr>
<td></td>
<td>• Disable</td>
</tr>
<tr>
<td></td>
<td>Default Setting: Enable</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TPM Security</td>
<td>Allows you to enable the Trusted Platform Module (TPM) during POST. Default Setting: <strong>Disabled</strong></td>
</tr>
</tbody>
</table>
| Computrace          | Allows you to activate or disable the optional Computrace software. The options are: • Deactivate • Disable • Activate  
|                     | **NOTE:** The Activate and Disable options permanently activates or disables the feature and no further changes are allowed. Default Setting: **Deactivate** |
| CPU XD Support      | Allows you to enable the Execute Disable mode of the processor. Default Setting: **Enabled**                                               |
| Non-Admin Setup Changes | Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password. Default Setting: **Disabled** |
| Password Configuration | Allows you to determine the minimum and maximum length of Administrator and System passwords.                                             |
| Admin Setup Lockout | Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: **Disabled**                        |

**Performance**

The following table describe the menu options of the **Performance** menu.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi Core Support</td>
<td>Allows you to enable or disable multi-core support for the processor. The options are:</td>
</tr>
<tr>
<td></td>
<td>• All</td>
</tr>
<tr>
<td></td>
<td>• 1</td>
</tr>
<tr>
<td></td>
<td>• 2</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>All</strong></td>
</tr>
<tr>
<td>Intel SpeedStep</td>
<td>Allows you to enable or disable the Intel SpeedStep feature.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enabled</strong></td>
</tr>
<tr>
<td>C-States Control</td>
<td>Allows you to enable or disable the additional processor sleep states.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: The options <strong>C states, C3, C6, Enhanced C-states</strong>, and <strong>C7</strong> options are selected/enabled.</td>
</tr>
<tr>
<td>Limit CPUID</td>
<td>Allows you to limit the maximum value the processor Standard CPUID Function will support.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enable CPUID Limit</strong></td>
</tr>
<tr>
<td>Intel TurboBoost</td>
<td>Allows you to enable or disable the Intel TurboBoost mode of the processor.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enabled</strong></td>
</tr>
<tr>
<td>HyperThread Control</td>
<td>Allows you to enable or disable the HyperThreading in the processor.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enabled</strong></td>
</tr>
</tbody>
</table>

**Power Management**

The following table describe the menu options of the **Power Management** menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Behavior</td>
<td>Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Disabled</strong></td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Auto On Time</td>
<td>Allows you to set the time at which the computer must turn on automatically. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>• Every Day</td>
</tr>
<tr>
<td></td>
<td>• Weekdays</td>
</tr>
<tr>
<td>Default Setting:</td>
<td>Disabled</td>
</tr>
<tr>
<td>USB Wake Support</td>
<td>Allows you to enable USB devices to wake the system from Standby.</td>
</tr>
<tr>
<td>Default Setting:</td>
<td>Disabled</td>
</tr>
<tr>
<td><strong>NOTE:</strong> This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup will remove power from all of the USB ports to conserve battery power.</td>
<td></td>
</tr>
<tr>
<td>Wireless Radio Control</td>
<td>Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection.</td>
</tr>
<tr>
<td>Default Setting:</td>
<td>The options Control WLAN radio and Control WWAN radio are selected.</td>
</tr>
<tr>
<td>Wake on LAN/WLAN</td>
<td>This field allows the computer to power up from the off state when triggered by a special LAN signal or from Hibernate state when triggered by a special wireless LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC.</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• WLAN Only — Allow the system to be powered on by special WLAN signals.</td>
</tr>
<tr>
<td></td>
<td>• LAN or WLAN — Allow the system to be powered on by special LAN or wireless LAN signals.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Disabled</strong></td>
</tr>
</tbody>
</table>

### ExpressCharge

Allows you to enable or disable the ExpressCharge feature. The options are:

• Standard
• ExpressCharge

Default Setting: **ExpressCharge**

### POST Behavior

The following table describe the menu options of the **POST Behavior** menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapter Warnings</td>
<td>Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enable Adapter Warnings</strong> is selected.</td>
</tr>
<tr>
<td>Keypad (Embedded)</td>
<td>Allows you to choose one or two methods to enable the keypad that is embedded in the internal keyboard.</td>
</tr>
<tr>
<td></td>
<td>• Fn Key Only</td>
</tr>
<tr>
<td></td>
<td>• By Num Lk</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Fn Key Only</strong></td>
</tr>
<tr>
<td>Mouse/Touchpad</td>
<td>Allows you to define how the system handles mouse and touch pad input. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Serial Mouse</td>
</tr>
<tr>
<td></td>
<td>• PS2 Mouse</td>
</tr>
<tr>
<td></td>
<td>• Touchpad/PS-2 Mouse</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Touchpad/PS-2 Mouse</strong></td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Numlock Enable</td>
<td>Allows you to enable the Numlock option when the computer boots.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enable Numlock</strong> is selected.</td>
</tr>
<tr>
<td>Fn Key Emulation</td>
<td>Allows you to set the option where the &lt;Scroll Lock&gt; key is used to simulate the &lt;Fn&gt; key feature.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enable Fn Key Emulation</strong> is selected.</td>
</tr>
<tr>
<td>POST HotKeys</td>
<td>Allows you enable the sign-on screen message display indicating the keystroke sequence to access the System Setup option menu.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enable F12 Boot Option Menu</strong> is selected.</td>
</tr>
<tr>
<td>Fastboot</td>
<td>Allows to set the option to speed up the boot process. The options are:</td>
</tr>
<tr>
<td></td>
<td>• Minimal</td>
</tr>
<tr>
<td></td>
<td>• Thorough</td>
</tr>
<tr>
<td></td>
<td>• Auto</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Thorough</strong></td>
</tr>
</tbody>
</table>

**Virtualization Support**

The following table describe the menu options of the **Virtualization Support** menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtualization</td>
<td>Allows you to enable or disable the Intel Virtualization Technology.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Enable Intel Virtualization Technology</strong> is selected.</td>
</tr>
<tr>
<td>VT for Direct I/O</td>
<td>Allows you to enable or disable Virtualization Technology for Direct I/O.</td>
</tr>
<tr>
<td></td>
<td>Default Setting: <strong>Disabled</strong> is selected.</td>
</tr>
<tr>
<td>Trusted Execution</td>
<td>This option specifies whether a Measured Virtual Machine Monitor (MVMM) can</td>
</tr>
</tbody>
</table>
utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM Virtualization Technology and Virtualization Technology for Direct I/O must be enabled to use this feature.
Default Setting: Disabled is selected.

Wireless
The following table describe the menu options of the **Wireless** menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Switch</td>
<td>Allows to set the wireless devices that can be controlled by the wireless switch. The options are:</td>
</tr>
<tr>
<td></td>
<td>• WWAN</td>
</tr>
<tr>
<td></td>
<td>• WLAB</td>
</tr>
<tr>
<td></td>
<td>• Bluetooth</td>
</tr>
<tr>
<td>Default Setting:</td>
<td>All the options are selected.</td>
</tr>
<tr>
<td>Wireless Device Enable</td>
<td>Allows you to enable or disable the wireless devices</td>
</tr>
<tr>
<td>Default Setting:</td>
<td>All the options are selected.</td>
</tr>
</tbody>
</table>

Maintenance
The following table describe the menu options of the **Maintenance** menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Tag</td>
<td>Displays the Service Tag of your computer.</td>
</tr>
</tbody>
</table>

**NOTE:** If a Service Tag has not been set for this system, the computer will automatically bring up this screen when users enter the BIOS. You will be prompted to enter the Service Tag.

| Asset Tag | Displays the Asset Tag. |
System Logs
The following table describe the menu options of the **System Logs** menu.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Events</td>
<td>Allows you to view and clear the System Setup (BIOS) POST events.</td>
</tr>
<tr>
<td>DellDiag Events</td>
<td>Allows you to view and clear the DellDiag events.</td>
</tr>
<tr>
<td>Thermal Events</td>
<td>Allows you to view and clear the Thermal events.</td>
</tr>
<tr>
<td>Power Events</td>
<td>Allows you to view and clear the Power events.</td>
</tr>
</tbody>
</table>
Device Status Lights

- **Turns on when you turn on the computer and blinks when the computer is in a power management mode.**
- **Turns on when the computer reads or writes data.**
- **Turns on steadily or blinks to indicate battery charge status.**
- **Turns on when wireless networking is enabled.**

Battery Status Lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

- **Alternately blinking amber light and blue light** — An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
- **Alternately blinking amber light with steady blue light** — Temporary battery failure with AC adapter present.
- **Constantly blinking amber light** — Fatal battery failure with AC adapter present.
- **Light off** — Battery in full charge mode with AC adapter present.
- **Blue light on** — Battery in charge mode with AC adapter present.

LED Error Codes

The following table shows the possible LED codes that may display when your computer is unable to complete a power on self test.

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Description</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinking</td>
<td>Solid</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Description</td>
<td>Next Step</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
</tbody>
</table>
| Solid      | Memory is detected but has errors. | 1. Reseat the memory.  
2. If two modules are installed remove one and test. Try the other module in the same slot and test. Test the other slot with both modules.  
3. Replace the memory.  
4. Replace the system board. |
| Blinking   | System board error | Replace the system board. |
| Blinking   | Video card error | Replace the system board. |
| Blinking   | Keyboard error | 1. Reseat the keyboard cable.  
2. Replace the keyboard. |
| Blinking   | USB controller error | Unplug the USB device (if any) |
| Solid      | No SODIMMs are installed. | 1. Install supported memory modules.  
2. If memory is already present, reseat the module(s) one at a time in each slot.  
3. Try known good memory from another computer or replace the memory. |
<table>
<thead>
<tr>
<th>Appearance</th>
<th>Description</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinking</td>
<td>Solid</td>
<td>Blinking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off</td>
<td>Blinking</td>
<td>Blinking</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
การติดต่อกับ Dell

หมายเหตุ: หากไม่สามารถติดต่อผ่านอินเทอร์เน็ต สามารถติดต่อผ่านที่อยู่อีเมล ไปยังกันตอิเล็กทรอนิกส์ บิล หรือแคตตาล็อกสินค้าของ Dell

Dell มีบริการความช่วยเหลือหลายแบบ รวมถึงเว็บไซต์, โทรศัพท์ และอีเมล์ การจัดหาบริการจะขึ้นกับประเทศและประเภทผลิตภัณฑ์ การบริการบางส่วนอาจไม่มีในพื้นที่ของคุณ การติดต่อกับฝ่ายขายของ Dell ฝ่ายบริการทางเทคนิคหรือฝ่ายบริการลูกค้าเพื่อแจ้งปัญหา:

1. กรุณาเข้าไปที่เว็บไซต์ support.dell.com
2. เลือกประเภทบริการที่เกี่ยวข้อง
3. หากลูกค้าไม่ใช่ลูกค้าในสหรัฐฯ, ให้เลือกประเทศในด้านล่าง หรือเลือก All เพื่อดูลิสต์เลือกเพิ่มเติม
4. เลือกลิงค์ของบริการหรือความช่วยเหลือที่ตรงกับความต้องการของคุณ