Dell Precision T1600 Service Manual

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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Contents

Working on Your Computer

Before Working Inside Your Computer

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

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

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

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

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

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

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

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

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

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer (see Turning Off Your Computer).

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

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.**

Recommended Tools

The procedures in this document may require the following tools:

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

Turning Off Your Computer

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

1. Shut down the operating system:

   – In Windows 8:

     * Using a touch-enabled device:

       a. Swipe in from the right edge of the screen, opening the Charms menu and select **Settings**.

b. Select the ⏻ and then select **Shut down**

* Using a mouse:

a. Point to upper-right corner of the screen and click **Settings**.

b. Click the ⏻ and select **Shut down**.

– In Windows 7:

1. Click **Start** .
2. Click **Shut Down.**

or

1. Click **Start** .
2. Click the arrow in the lower-right corner of the **Start** menu as shown below, and then click **Shut Down.**.

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

After Working Inside Your Computer

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

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 the Dell Diagnostics.

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Cover

Removing The Cover

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.
2. Pull up the cover release latch at the side of the computer.

3. Lift the cover upward to a 45—degree angle and remove it from the computer.

Related Links

> <u>Installing The Cover</u>

Installing The Cover

1. Place the cover on the computer.
2. Press down on the cover till it clicks into place.
3. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing The Cover

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Front Bezel

Removing The Front Bezel

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

2. Remove the Cover.

3. Gently pry the front bezel retention clips away from the chassis located at the side edge of front bezel.

4. Rotate the bezel away from the computer to release the hooks on the opposite edge of the bezel from the chassis.

Related Links
Installing The Front Bezel

Installing The Front Bezel

1. Insert the hooks along the bottom edge of the front bezel into the slots on the chassis front.
2. Rotate the bezel toward the computer to engage the four front-bezel retention clips until they click into place.
3. Install the Cover.
4. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing The Front Bezel

Expansion Card Tab

Removing The Expansion Card

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

2. Remove the Cover.

3. Push the release tab on the card-retention latch outward.

4. Gently pull the release lever away from the PCIe x16 card until you release the securing tab from the dent in the card. Then, ease the card up and out of its connector and remove it from the system.

5. Lift the PCIe x1 expansion card (if any) up and out of its connector and remove it from the system.

6. Lift the PCI expansion card (if any) up and out of its connector and remove it from the system.

7. Lift the PCI x4 expansion card (if any) up and out of its connector and remove it from the system.

Related Links

Installing The Expansion Card

Installing The Expansion Card

1. Insert the PCIe x4 card into the connector on the system board and press down until it is securely in place.
2. Insert the PCIe card into the connector on the system board and press down until it is securely in place.
3. Insert the PCIe x1 card into the connector on the system board and press down until it is securely in place.
4. Insert the PCIe x16 card into the connector on the system board and press down until it is securely in place.
5. Press the retention tab on the card-retention latch downwards.
6. Install the Cover.
7. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing The Expansion Card

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Optical Drive

Removing The Optical Drive

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the Cover.
3. Remove the Front Bezel.
4. Remove the data cable(1) and power cable(2) from the back of the optical drive.

5. Slide down the optical drive latch and then push the optical drive from the back toward the front of the computer.

6. Repeat steps four and five to remove the second optical drive (if available).

Related Links

Installing The Optical Drive

1. Slide up the optical drive latch and then push the optical drive from the front toward the back of the computer.
2. Connect the data cable and power cable to the back of the optical drive.
3. Install the Front Bezel.
4. Install the Cover.
5. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing The Optical Drive

Hard Drive

Removing The Hard Drive

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.

2. Remove the <u>Cover</u>.

3. Remove the data cable(1) and power cable(2) from the back of the hard drive.

4. Press both blue securing-bracket tabs inward and lift the hard drive bracket out of the bay.

5. Flex the hard drive bracket and then remove the hard drive from the bracket.

6.   Repeat the preceding steps for the second hard drive, if available.

Related Links

Installing the Hard Drive

Installing The Hard Drive

1.   Flex the hard drive bracket and then insert the hard drive into the bracket.
2.   Press both blue securing-bracket tabs inward and slide the hard drive bracket into the bay in the chassis.
3.   Connect the data cable and power cable to the back of the hard drive.
4.   Install the Cover.
5.   Follow the procedures in After Working Inside Your Computer.

Related Links

Removing The Hard Drive

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Memory

Removing The Memory

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

2. Remove the Cover.

3. Press down on the memory retaining tabs on each side of the memory modules.

4. Lift the memory modules out of the connectors on the system board.

Related Links

Installing the Memory

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Installing The Memory

1. Insert the memory modules into the connectors on the system board. Install the memory in the order of A1 > B1 > A2 > B2.
2. Press down on the memory modules until the release tabs spring back to secure them in place.
3. Install the Cover.
4. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing the Memory

Chassis Intrusion Switch

Removing The Intrusion Switch

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

2. Remove the Cover.

3. Disconnect the intrusion cable from system board.

4. Slide the intrusion switch toward the chassis bottom and remove it from the chassis.

Related Links

Installing the Intrusion Switch

Installing The Intrusion Switch

1. Insert the Intrusion Switch into the chassis rear and slide it toward the chassis top to secure it.
2. Connect the intrusion cable to the system board.
3. Install the Cover.
4. Follow the procedures in After Working Inside Your Computer.
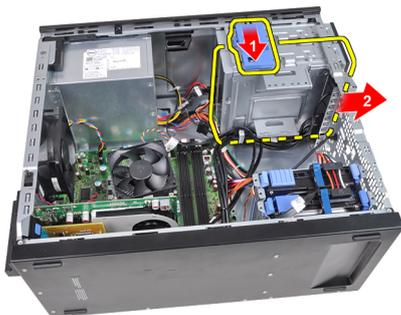
Related Links

Removing the Intrusion Switch

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Speaker

Removing The Internal Speaker

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.
2. Remove the <u>Cover</u>.
3. Disconnect the speaker cable from the system board.

4. Unthread the internal speaker cable from the chassis clip.

5. Press down the speaker-securing tab and slide the speaker upwards to remove.

Installing The Internal Speaker

1. Press the speaker-securing tab and slide the speaker downward to secure it.
2. Thread the internal speaker cable into the chassis clip.
3. Connect the speaker cable to the system board.
4. Install the Cover.
5. Follow the procedures in After Working Inside Your Computer.

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Processor

Removing The Heat Sink And Processor

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

2. Remove the Cover.

3. Disconnect the heat sink/fan assembly cable from the system board.

4. Use a Phillips screwdriver to loosen the captive screws securing the heat sink/fan assembly to the system board.

5. Lift the heat sink/fan assembly upward gently, and remove it from the system. Lay the assembly with the fan facing downward, and with the thermal grease facing upward.

6. Press the release lever down and then move it outward to release it from the retention hook that secures it.

7. Lift the processor cover.

8. Lift the processor to remove it from the socket and place it in antistatic packaging.

Related Links

[Installing the Heat Sink and Processor](#)

Installing The Heat Sink And Processor

1. Insert the processor into the processor socket. Ensure the processor is properly seated.
2. Gently lower the processor cover.
3. Press the release lever down and then move it inward to secure it with the retention hook.
4. Place the heat sink/fan assembly into the chassis.
5. Use a Phillips screwdriver to tighten the captive screws securing the heat sink/fan assembly to the system board.
6. Connect the heat sink/fan assembly cable to the system board.
7. Install the [Cover](#).
8. Follow the procedures in [After Working Inside Your Computer](#).

Related Links

[Removing the Heat Sink and Processor](#)

Coin-Cell Battery

Removing The Coin-Cell Battery

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.

2. Remove the <u>Cover</u>.

3. Carefully press the release latch away from the battery to allow the battery to pop up from the socket.

4. Lift the coin-cell battery out of the computer.

Related Links

<u>Installing the Coin-Cell Battery</u>

Installing The Coin-Cell Battery

1. Place the coin cell battery into the slot on the system board.
2. Press the coin cell battery downward until the release latch springs back into place and secures it.
3. Install the Cover.
4. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing the Coin-Cell Battery

Power-Switch Cable

Removing The Power Switch Cable

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.

2. Remove the <u>Cover</u>.

3. Remove the <u>Front Bezel</u>.

4. Remove the <u>Optical Drive</u>.

5. Disconnect the power switch cable from the system board.
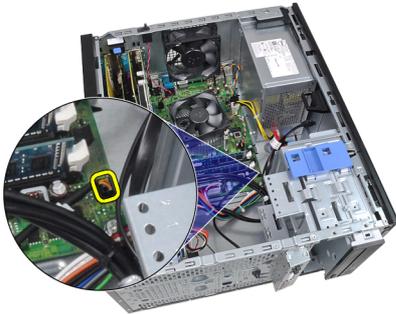
6. Unthread the power switch cable from the chassis clips.
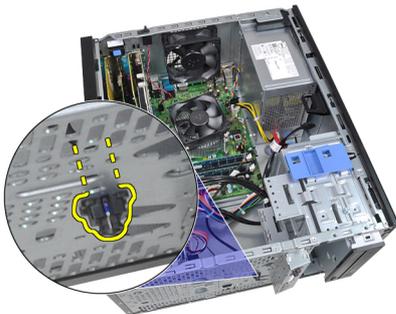
7. Unthread the power switch cable from the chassis clip.

8. Gently pry the power switch cable free.

9. Slide the power switch cable out through the front of the computer.

Related Links
    Installing the Power Switch Cable

Installing The Power Switch Cable

1. Slide the power switch cable in through the front of the computer.
2. Secure the power switch cable to the chassis.

3. Thread the power switch cable into the chassis clips.
4. Connect the power switch cable to the system board.
5. Install the Optical Drive.
6. Install the Front Bezel.
7. Install the Cover.
8. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing the Power Switch Cable

Front Thermal Sensor

Removing The Front Thermal Sensor

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.
2. Remove the <u>Cover</u>.
3. Disconnect the thermal sensor cable from the system board.

4. Unthread the thermal sensor cable from the chassis clip.

5. Gently pry the thermal sensor away from the chassis front and remove.

Related Links

    Installing the Front Thermal Sensor

Installing The Front Thermal Sensor

1. Gently secure the thermal sensor to the chassis front.
2. Thread the thermal sensor cable into the chassis clips.
3. Connect the thermal sensor cable to the system board.
4. Install the Cover.
5. Follow the procedures in After Working Inside Your Computer.

Related Links

    Removing the Front Thermal Sensor

System Fan

Removing The System Fan

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.

2. Remove the <u>cover</u>.

3. Disconnect the chassis fan cable from the system board.

4. Pry and remove the system fan away from the four grommets securing it to the back of the computer.

Related Links

<u>Installing the System Fan</u>

Installing The System Fan

1. Place the chassis fan in the chassis.
2. Pass the four grommets through the chassis and slide outward along the groove to secure in place.
3. Connect the fan cable to the system board.
4. Install the Cover.
5. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing the System Fan

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Input/Output Panel

Removing The Input/Output Panel

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

2. Remove the Cover.

3. Remove the Front Bezel.

4. Disconnect the Input/output panel and FlyWire cable from the system board.

5. Unthread the I/O Panel and FlyWire cable from the clip on the computer.

6. Remove the screw that secures the I/O panel to the computer.

7. Slide the I/O panel towards the left of the computer to release it.
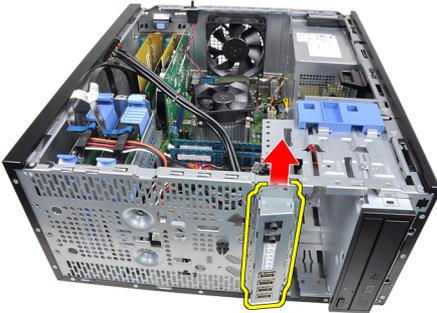
8. Remove the I/O panel by routing the cable through the front of the computer.

Related Links

Installing the Input/Output Panel

Installing The Input/Output Panel

1. Insert the Input/Output Board into the slot on the chassis front.
2. Slide the Input/Output Board towards the right of the computer to secure to the chassis.
3. Use a Phillips screwdriver to tighten the single screw securing the Input/Output Board to the chassis.
4. Thread the Input/Output Board/FlyWire cable into the chassis clip.
5. Connect the Input/Output Board/FlyWire cable to the system board.
6. Install the Front Bezel.
7. Install the Cover.
8. Follow the procedures in After Working Inside Your Computer.

Related Links

Removing the Input/Output Panel

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# Power Supply

Removing The Power Supply

1. Follow the procedures in <u>Before Working Inside Your Computer</u>.
2. Remove the <u>Cover</u>.
3. Disconnect the power cables connected to the hard drive(s) and optical drive(s).

4. Unthread the power cables from the clips in the computer.

5. Disconnect the 24-pin power cable from the system board.

6. Disconnect the 4-pin power cable from the system board.

7. Remove the four screws securing the power supply to the back of the computer.

8. Push in on the blue release tab beside the power supply (1), and slide the power supply towards the front of the computer (2).

9. Lift the power supply out of the computer.

Related Links

[Installing the Power Supply](#)

Installing The Power Supply

1. Place the power supply in the chassis and slide towards the back of the system to secure it.

2. Use a Phillips screwdriver to tighten the screws securing the power supply to the back of the computer.

3. Connect the 4-pin power cable to the system board.

4. Connect the 24-pin power cable to the system board.

5. Thread the power cables into the chassis clips.

6. Connect the power cables connected to the hard drives(s) and optical drive(s).

7. Install the [Cover](#).

8. Follow the procedures in [After Working Inside Your Computer](#).

Related Links

[Removing the Power Supply](#)

System Board

Removing The System Board

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the Cover.
3. Remove the Front Bezel.
4. Remove the Expansion Card.
5. Remove the heat sink and processor.
6. Disconnect all the cables connected to the system board.

7. Remove the screws that secure the system board to the computer.

8. Slide the system board towards the front of the computer.

9. Carefully tilt the system board to 45–degrees, and then lift the system board out of the computer.

Related Links

    Installing the System Board

Installing The System Board

1. Align the system board to the port connectors on the rear of the chassis and place the system board in the chassis.
2. Tighten the screws securing the system board to the chassis.
3. Connect the cables to the system board.
4. Install the Heat sink and Processor.
5. Install the Expansion Card.
6. Install the Front Bezel.
7. Install the Cover.
8. Follow the procedures in After Working Inside Your Computer.

Related Links

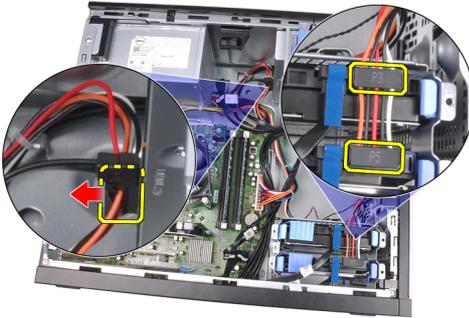   Removing the System Board

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System Setup

System Setup

The system offers the following options:

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

Press <F2> to enter System Setup and make changes to the user-definable settings. If you have trouble entering System Setup using this key, press <F2> when the keyboard LEDs first flash.

Boot Menu

This system includes a one-time boot menu. This feature gives users a quick and convenient mechanism to bypass the System Setup-defined boot device order and boot directly to a specific device (for example: floppy, CD-ROM, or hard drive).

Keystroke	Function
<Ctrl><Alt><F8>	One-time boot and diagnostics utility menu
<F12>	One-time boot and diagnostics utility menu

Boot Menu Enhancements

The boot menu enhancements introduced on previous platforms are as follows:

- **Easier access** — Although the <Ctrl><Alt><F8> keystroke still exists and can be used to call up the menu, simply press <F12> during system boot to access the menu.
- **User prompting** — Not only is the menu easy to access, but the user is prompted to use the keystroke on the BIOS splash screen (see image below). The keystroke is no longer "hidden" from the user.
- **Diagnostics options** — The boot menu includes two diagnostic options, **IDE Drive Diagnostics** (90/90 Hard Drive Diagnostics) and Boot to the Utility Partition. The

benefit here is that the user does not have to remember the <Ctrl><Alt><D> and <Ctrl><Alt><F10> keystrokes (although they still work).

NOTE: The BIOS features an option to disable either or both of the keystroke prompts under the System Security / Post Hotkeys submenu.

When you enter the <F12> or <Ctrl><Alt><F8> keystroke correctly, the system beeps. The key sequence invokes the Boot Device Menu that is similar in appearance to the Microsoft boot menu.

Since the one-time boot menu only affects the current boot, it has the added benefit of not requiring the technician to restore the customer's boot order after completing troubleshooting.

Timing Key Sequences

The keyboard is not the first device initialized by Setup. As a result, if you press a keystroke too early, you lock out the keyboard. When this happens, a keyboard error message appears on the monitor, and you cannot restart the system with the <Ctrl><Alt><Del> keys.

To avoid this scenario, wait until the keyboard is initialized before pressing the keystroke. There are two ways to know that this has happened:

- The keyboard lights flash.
- The "F2=Setup" prompt appears in the top right-hand corner of the screen during boot.

The second method is good if the monitor is already warmed up. If it is not, the system often passes the window of opportunity before the video signal is visible. If this is the case, rely on the first method—the keyboard lights—to know the keyboard is initialized.

Beep Codes And Text Error Messages

The OptiPlex BIOS is capable of displaying error messages in plain English, along with beep codes. If the BIOS determines the previous boot was unsuccessful, it displays an error message similar to the following:

```
Previous attempts at booting the system have failed at
checkpoint _____. For help resolving this problem, please
note this checkpoint and contact Dell Technical Support.
```

The blank is filled with a SmartVu code. To research the code given, search for the phrase *SMVU codes* in the Dell Knowledge Base. These codes are only meant to be indicators; perform thorough troubleshooting before replacing components.

Navigation

The system setup can be navigated by either the keyboard or the mouse.

Use the following keystrokes to navigate the BIOS screens:

Action	Keystroke
Expand and collapse field	<Enter>, left- or right-arrow key, or +/–
Expand or collapse all fields	< >
Exit BIOS	<Esc> — Remain in Setup, Save/Exit, Discard/Exit
Change a setting	Left or right-arrow key
Select field to change	<Enter>
Cancel modification	<Esc>
Reset defaults	<Alt><F> or **Load Defaults** menu option

System Setup Options

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

General

System Information	Displays the following information:
	• System Information: Displays **BIOS Version, Service Tag, Asset Tag, Ownership Date, Manufacture Date,** and the **Express Service Code**.
	• Memory Information: Displays **Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM 1 Size, DIMM 2 Size, DIMM 3 Size,** and **DIMM 4 Size**.
	• Processor Information: Displays **Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable,** and **64-Bit Technology.**
	• PCI Information: Displays **SLOT1, SLOT2, SLOT3, SLOT4**
	• Device Information: Displays **SATA-0, SATA-1, SATA-2, SATA-3,** and **LOM MAC Address.**
Boot Sequence	Specifies the order in which the computer attempts to find an operating system from the devices specified in this list.
	• USB Storage Device
	• CD/DVD/CD-RW Drive
	• Onboard NIC
	• SATA
Date/Time	Displays current date and time settings. Changes to the system date and time take effect immediately.

System Configuration

Integrated NIC	Enables or disables the integrated network card. You can set the integrated NIC to:
	• Disabled
	• Enabled (default)
	• Enabled w/PXE
	NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not appear.
System Management	• Disabled
	• DASH/ASF 2.0

System Configuration

Serial Port	Identifies and defines the serial port settings. You can set the serial port to:

- Disabled
- COM1
- COM2
- COM3
- COM4

> **NOTE:** The operating system may allocate resources even though the setting is disabled.

SATA Operation	Configures the operating mode of the integrated hard drive controller.

- RAID Autodetect / AHCI = RAID if signed drives, otherwise AHCI.
- RAID Autodetect / AATA = RAID if signed drives, otherwise ATA.
- RAID ON / ATA = SATA is configured for RAID on every boot.
- Legacy = The hard drive controller is configured for legacy mode

> **NOTE:** Legacy mode provides for compatibility with some older operating systems that do not support native resources assigned to the drive controller. RAID Mode is incompatible with ImageServer. Please disable RAID mode if enabling ImageServer.

Drives	These fields let you enable or disable various drives on board:

- SATA-0
- SATA-1
- SATA-2
- SATA-3

Smart Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification. This option is disabled by default.

System Configuration

USB Configuration	This field configures the integrated USB controller. You can set the USB Controller to :

- Enable USB Controller
- Disable USB Mass Storage Dev
- Disable USB Controller

Miscellaneous Devices	This field lets you enable or disable the following on-board devices.

- Enable front USB
- Enable Rear Quad USB
- Enable Rear Dual USB
- Enable PCI Slot

Video

Primary Video	This field determines which video controller will become the primary video controller when 2 controllers are available in the system. This selection matters only if there are 2 video controllers present.

- Auto(default) - Use the add-in video controller.
- Onboard/PEG - Use the integrated video controller unless a Graphic card is installed. A PCI Express Graphic (PEG) card will override and disable the integrated video controller.

Security

Strong Password	This field enforces strong passwords. If enabled, all passwords must contain at least one uppercase character, one lowercase character, and be at least 8 characters long. Enabling this feature automatically changes the default minimum password length to 8 characters. Enforce strong password - This option is disabled by default.
Password Configuration	These fields control the minimum and maximum number of characters allowed for Admin and System passwords. Changes to these fields are not active until they are committed via the apply button or saving changes before exiting setup.

- Admin Password Min

- Admin Password Max
- System Password Min
- System Password Max

Password Changes	Enables or disables the user from changing the system password without the administrative password. This option is enabled by default.
Non-Admin Setup Changes	This option lets you determine whether changes to the setup option are permitted when an administrator password is set. If disabled, the setup option is locked by the admin password. It cannot be modified unless setup is locked. Setup is unlocked when there is no admin password, or when the admin password has been entered. When enabled, the device setting can be modified even when other setup options are locked by the admin password.
TPM Security	This option lets you control whether the Trusted Platform Module (TPM) in the system is enabled and visible to the operating system. You can set the TPM Security to :

- Deactivate
- Disable
- Activate

> **NOTE:** When the TPM security is set to "Clear", the system setup program clears the owner information stored in the TPM. Use this setting to restore the TPM to its default state if you lose or forget the owner authentication data.

Computrace	This field lets you Activate or Disable the BIOS module interface of the optional Computrace Service from Absolute Software. Enables or disables the optional Computrace service designed for asset management. The Computrace agent from Absolute Software tracks assets and provides recovery services in the event the computer is lost or stolen. The Computer agent communicates with the Absolute Software Monitoring Server at programmed intervals to provide the tracking service. By activating the service, you consent to the transmission of information from and to your computer and the Absolute Software Monitoring Server. The Computrace service is purchased as an option and the monitoring Server will

	enable its agent security module through an interface provided by the BIOS. Computrace and Absolute are registred trademarks of Absolute Software Corporation. • **Deactivate** - This option is disabled by default. • Disable • Activate
Chassis Intrusion	This field controls the chassis intrusion feature. You can set this option to: • **Clear Intrusion Warning** — Enabled by default if chassis intrusion is detected. • Disable • Enable • **On-Silent** — Enabled by default if chassis intrusion is detected.
CPU XD Support	Enables or disables the execute disable mode of the processor. This option is enabled by default.
OROM Keyboard Access	This option determines whether users are able to enter Option ROM Configuration screens via hotkeys during boot. Specifically, these settings are capable of preventing access to Intel RAID (CTRL+I) or Intel Management Engine BIOS Extension (CTRL+P/F12) • **Enable** — User may enter OROM configuration screens via the hotkey. • **One-Time Enable** — User may enter OROM configuration screens via the hotkeys on next boot only. After next boot, the setting will revert to disabled. • **Disable** — User may not enter OROM configuration screens via the hotkey. This option is set to Enable by default.
Admin Setup Lockout	Enables or disables the user from entering Setup when an Admin password is set. This option is not set by default.

Performance	
Multi Core Support	This field specifies whether the process will have one or all cores enabled. The performance of some applications will

Performance

	improve with the additional cores. This option is enabled by default.
Intel® SpeedStep™	This option enables or disables the Intel SpeedStep mode of the processor. When disabled, the system is placed into the highest performance state and the Intel Speedstep applet, or native operating system driver, is prevented from adjusting the processor's performance. When enabled, the Intel SpeedStep-enabled CPU is allowed to operate in multiple performance states. This option is enabled by default.
C States Control	This option enables or disables additional processor sleep states. The operating system may optionally use these for additional power savings when idle. This option is enabled by default.
Limit CPUID	This field limits the maximum value the processor Standard CPUID Function will support. Some operating systems will not complete installation when the maximum CPUID Function supported is greater than 3. This option is disabled by default.
Hyper-Thread Control	This option enables or disables the Hyper-Threading Technology. When disabled, only one thread per enabled core is enabled. This option is enabled by default.

Power Management

AC Recovery	Determines how the system responds when AC power is re-applied after a power loss. You can set the AC Recovery to: • Power Off (default) • Power On • Last State
Auto On Time	Sets time to automatically turn on the computer. Time is kept in standard 12-hour format (hour:minutes:seconds). Change the startup time by typing the values in the time and AM/PM fields. ✎ **NOTE:** This feature does not work if you turn off your computer using the switch on a power strip or surge protector or if **Auto Power is set to disabled**.
Deep Sleep Control	Controls where Deep Sleep is enabled.

Power Management

Fan Control Override	Controls the speed of the system fan. This option is disabled by default.

> **NOTE:** When enabled, the fan runs at full speed.

Wake on LAN	This option allows the computer to power up from the off state when triggered by a special 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 power supply.

- **Disabled** - Does not allow the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN.
- **LAN Only** - Allows the system to be powered on by special LAN signals.

This option is Disabled by default.

POST Behavior

Numlock LED	Enables or disables the Numlock feature when your computer starts. When enabled (default), this option activates the numeric and mathematical features shown at the top of each key. When disabled, this option activates the cursor-control functions labeled on the bottom of each key.
Keyboard Errors	Enables or disables keyboard error reporting when the computer starts. This option is enabled by default.
POST Hotkeys	Allows you to specify the function keys to display on the screen when the computer starts. **Enable F2 — Setup** (enabled by default) **Enable F12 — Boot menu** (enabled by default)
Fast Boot	When enabled (default), your computer starts more quickly because it skips certain configurations and tests.

Virtualization Support

Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities

Virtualization Support

	provided by Intel® Virtualization Technology. **Enable Intel® Virtualization Technology** - This option is enabled by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. **Enable Intel® Virtualization Technology for Direct I/O** - This option is disabled by default.
Trusted Execution	This field specifies whether a Measured Virtual Machine (MVMM) can utilize the addition 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. **Enable Intel® Trusted Execution Technology** - This option is disabled by default.

Maintenance

Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
SERR Messages	Controls the SERR message mechanism. This option is not set by default. Some graphics cards require that the SERR message mechanism be disabled.

System Logs

BIOS Events	Displays the system event log and allows you to:
	• Clear Log
DellDiag Events	Displays the DellDiag event log.
Thermal Events	Displays the thermal event log and allows you to:
	• Clear Log
Power Events	Displays the power event log and allows you to:
	• Clear Log

System Logs

BIOS Progress Events	Displays the BIOS Progress event log.

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Troubleshooting

Diagnostic LEDs

NOTE: The diagnostic LEDs 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.

The diagnostic LEDs are located on the front of the chassis next to the power button. These diagnostic LEDs are only active and visible during the POST process. Once the operating system starts to load, they turn off and are no longer visible.
The system now includes pre-POST and POST LEDs in an attempt to help pinpointing a possible problem with the system easier and more accurate.

NOTE: The diagnostic lights will blink when the power button is amber or off, and will not blink when it is blue. This has no other significance.

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	Power Button LED		
① ② ③ ④	⏻	The computer is either turned off or is not receiving power.	• Re-seat the power cable in the power connector at the back of the computer and the electrical outlet. • Bypass power strips, power extension cables, and other power protection devices to verify that the computer turns on properly.

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	Power Button LED		
			• Ensure that any power strips being used are plugged into an electrical outlet and are turned on.
			• Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
			• Ensure that the main power cable and front panel cable are securely connected to the system board.
		A possible system board failure has occurred.	Unplug the computer. Allow one minute for the power to drain. Plug the computer into a working electrical outlet and press the power button.
		A possible system board, power supply, or peripheral failure has occurred.	• Power off computer, leaving the computer plugged in. Press and hold the power supply test button at the rear of the power supply unit. If the LED next to the switch

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	**Power Button LED**		
			illuminates, the problem may be with your system board.
			• If the LED next to the switch does not illuminate, disconnect all internal and external peripherals, and press and hold the power supply test button. If it illuminates, there could be a problem with a peripheral.
			• If the LED still does not illuminate, remove the PSU connections from the system board, then press and hold the power supply button. If it illuminates, there could be a problem with the system board.
			• If the LED still does not illuminate, the problem is with the power supply.
①②③④ ⏻		Memory modules are detected, but a memory power	• If two or more memory modules are installed, remove the

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	Power Button LED		
		failure has occurred.	modules, then re-install one module and re-start the computer. If the computer starts normally, continue to install additional memory modules (one at a time) until you have identified a faulty module or reinstalled all modules without error. If only one memory module is installed, try moving it to a different DIMM connector and re-start the computer. • If available, install verified working memory of the same type into your computer.
①②③④ 🔲		A possible CPU or system board failure has occurred.	Replace the CPU with a known good CPU. If the computer still fails to boot, inspect the CPU socket for damage.
①②③④ 🔲		BIOS may be corrupt or missing.	The computer hardware is operating normally but the BIOS may be corrupt or missing.

Light Pattern		Problem Description	Troubleshooting Steps
① ② ③ ④	⏻	A possible system board failure has occurred.	Remove all peripheral cards from the PCI and PCI-E slots and re-start the computer. If the computer boots, add the peripheral cards back one by one until you find the bad one.
① ② ③ ④	⏻	Power connector not installed properly.	Re-seat the 2x2 power connector from the power supply unit.
① ② ③ ④	⏻	Possible peripheral card or system board failure has occurred.	Remove all peripheral cards from the PCI and PCI-E slots and re-start the computer. If the computer boots, add the peripheral cards back one by one until you find the bad one.
① ② ③ ④	⏻	A possible system board failure has occurred.	• Disconnect all internal and external peripherals, and re-start the computer. If the computer boots, add the peripheral cards back one by one until you find the bad one. • If the problem persists, the

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	Power Button LED		
			system board is faulty.
①②③④ ⏻		A possible coin cell battery failure has occurred.	Remove the coin cell battery for one minute, reinstall the battery, and restart.
①②③④ ⏻		The computer is in a normal *on* condition. The diagnostic lights are not lit after the computer successfully boots to the operating system.	Ensure that the display is connected and powered on.
①②③④ ⏻		A possible processor failure has occurred.	Re-seat the processor.
①②③④ ⏻		Memory modules are detected, but a memory failure has occurred.	• If two or more memory modules are installed, remove the modules (see your service manual), then re-install one module (see your service manual) and re-start the computer. If the computer starts normally, continue to install additional memory modules (one at a time) until you have identified a faulty module or

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	**Power Button LED**		
			reinstalled all modules without error. • If available, install working memory of the same type into your computer.
①②③④ ⏻		A possible graphics card failure has occurred.	• Ensure that the display/monitor is plugged into a discrete graphic card. • Re-seat any installed graphics cards. • If available, install a working graphics card into your computer.
①②③④ ⏻		A possible floppy drive or hard drive failure has occurred.	Re-seat all power and data cables.
①②③④ ⏻		A possible USB failure has occurred	Re-install all USB devices and check all cable connections.
①②③④ ⏻		No memory modules are detected.	• If two or more memory modules are installed, remove the modules, then reinstall one module and restart the computer. If the computer starts

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	Power Button LED		
			normally, continue to install additional memory modules (one at a time) until you have identified a faulty module or reinstalled all modules without error. • If available, install working memory of the same type into your computer.
		Memory modules are detected, but a memory configuration or compatibility error has occurred.	• Ensure that no special requirements for memory module/ connector placement exist. • Ensure that the memory you are using is supported by your computer.
		A possible expansion card failure has occurred.	• Determine if a conflict exists by removing an expansion card (not a graphics card) and restarting the computer. • If the problem persists, reinstall the card you removed, then remove a different card

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	**Power Button LED**		
			and restart the computer.
			• Repeat this process for each expansion card installed. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts.
①②③④⏻		A possible system board resource and/or hardware failure has occurred.	• Clear CMOS. • Disconnect all internal and external peripherals, and restart the computer. If the computer boots, add the peripheral cards back one by one until you find the bad one. • If the problem persists, the system board / system board component is faulty.
①②③④⏻		Some other failure has occurred.	• Ensure that the display/monitor is plugged into a discrete graphic card. • Ensure that all hard drives and optical drive cables are properly

Light Pattern		Problem Description	Troubleshooting Steps
Diagnostic LEDs	**Power Button LED**		
			connected to the system board.
			• If there is an error message on the screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to make sure it is functioning properly.
			• If the operating system is attempting to boot from a device (such as the floppy drive or optical drive), check system setup to ensure the boot sequence is correct for the devices installed on your computer.

Beep Codes

The system can emit a series of beeps during start-up if the display cannot show errors or problems. These series of beeps, called beep codes, identify various problems. The delay between each beep is 300 ms, the delay between each set of beeps is 3 sec, and the beep sound lasts 300 ms. After each beep and each set of beeps, the BIOS should detect if the user presses the power button. If so, BIOS will jump out from looping and execute the normal shutdown process and power system.

Code	Cause
1-1-2	Microprocessor register failure
1-1-3	NVRAM
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer
1-2-2	DMA initialization failure
1-2-3	DMA page register read/write failure
1-3-1 through 2-4-4	DIMMs not being properly identified or used
3-1-1	Slave DMA register failure
3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
3-2-2	Interrupt vector loading failure
3-2-4	Keyboard Controller Test failure
3-3-1	NVRAM power loss
3-3-2	NVRAM configuration
3-3-4	Video Memory Test failure
3-4-1	Screen initialization failure
3-4-2	een retrace failure
3-4-3	Search for video ROM failure
4–2–1	No time tick
4–2–2	Shutdown failure
4–2–3	Gate A20 failure
4–2–4	Unexpected interrupt in protected mode
4–3–1	Memory failure above address 0FFFFh
4–3–3	Timer-chip counter 2 failure
4–3–4	Time-of-day clock stopped
4–4–1	Serial or parallel port test failure

Code	Cause
4–4–2	Failure to decompress code to shadowed memory
4–4–3	Math coprocessor test failure
4–4–4	Cache test failure

Error Messages

Error Message	Description
Address mark not found	The BIOS found a faulty disk sector or could not find a particular disk sector.
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.	The computer failed to complete the boot routine three consecutive times for the same error. Contact Dell and report the checkpoint code (nnnn) to the support technician.
Alert! Security override Jumper is installed.	The MFG_MODE jumper has been set and AMT Management features are disabled until it is removed.
Attachment failed to respond	The floppy or hard drive controller cannot send data to the associated drive.
Bad command or file name	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct pathname.
Bad error-correction code (ECC) on disk read	The floppy or hard drive controller detected an uncorrectable read error.
Controller has failed	The hard drive or the associated controller is defective.
Data error	The floppy or hard drive cannot read the data. For the Windows operating system, run the chkdsk utility to check the file structure of the floppy or hard drive. For any other operating system, run the appropriate corresponding utility.
Decreasing available memory	One or more memory modules may be faulty or improperly seated. Re-install the

Error Message	Description
	memory modules and, if necessary, replace them.
Diskette drive 0 seek failure	A cable may be loose or the computer configuration information may not match the hardware configuration.
Diskette read failure	The floppy disk may be defective or a cable may be loose. If the drive access light turns on, try a different disk.
Diskette subsystem reset failed	The floppy drive controller may be faulty.
Drive not ready	No floppy disk is in the drive. Put a floppy disk in the drive.
Diskette write protected	The floppy disk is write-protected. Slide the write-protect notch to the open position.
Gate A20 failure	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
General failure	The operating system is unable to carry out the command. This message is usually followed by specific information—for example, **Printer out of paper**. Take the appropriate action to resolve the problem.
Hard-disk drive configuration error	The hard drive failed initialization.
Hard-disk drive controller failure	The hard drive failed initialization.
Hard-disk drive failure	The hard drive failed initialization.
Hard-disk drive read failure	The hard drive failed initialization.
Invalid configuration information-please run SETUP program	The computer configuration information does not match the hardware configuration.
Invalid Memory configuration, please populate DIMM1	DIMM1 slot does not recognize a memory module. The module should be re-seated or installed.
Keyboard failure	A cable or connector may be loose, or the keyboard or keyboard/mouse controller may be faulty.

Error Message	Description
Memory address line failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory allocation error	The software you are attempting to run is conflicting with the operating system, another program, or a utility.
Memory data line failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory double word logic failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory odd/even logic failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them
Memory write/read failure at address, read value expecting value	A memory module may be faulty or improperly seated. Reinstall the memory modules and, if necessary, replace them.
Memory size in CMOS invalid	The amount of memory recorded in the computer configuration information does not match the memory installed in the computer.
Memory tests terminated by keystroke	A keystroke interrupted the memory test.
No boot device available	The computer cannot find the floppy disk or hard drive.
No boot sector on hard-disk drive	The computer configuration information in System Setup may be incorrect.
No timer tick interrupt	A chip on the system board might be malfunctioning.
Non-system disk or disk error	The floppy disk in drive A does not have a bootable operating system installed on it. Either replace the floppy disk with one that has a bootable operating system, or remove the floppy disk from drive A and restart the computer.
Not a boot diskette	The operating system is trying to boot to a floppy disk that does not have a bootable

Error Message	Description
	operating system installed on it. Insert a bootable floppy disk.
Plug and play configuration error	The computer encountered a problem while trying to configure one or more cards.
Read fault	The operating system cannot read from the floppy or hard drive, the computer could not find a particular sector on the disk, or the requested sector is defective.
Requested sector not found	The operating system cannot read from the floppy or hard drive, the computer could not find a particular sector on the disk, or the requested sector is defective.
Reset failed	The disk re-set operation failed.
Sector not found	The operating system cannot locate a sector on the floppy or hard drive.
Seek error	The operating system cannot find a specific track on the floppy disk or hard drive.
Shutdown failure	A chip on the system board might be malfunctioning.
Time-of-day clock stopped	The battery might be dead.
Time-of-day not set-please run the System Setup program	The time or date stored in System Setup does not match the computer clock.
Timer chip counter 2 failed	A chip on the system board may be malfunctioning.
Unexpected interrupt in protected mode	The keyboard controller may be malfunctioning or a memory module may be loose.
WARNING: Dell's Disk Monitoring System has detected that drive [0/1] on the [primary/secondary] EIDE controller is operating outside of normal specifications. It is advisable to immediately back up your data and replace your hard drive by calling your support desk or Dell	During initial startup, the drive detected possible error conditions. When your computer finishes booting, immediately back up your data and replace your hard drive (for installation procedures, see "Adding and Removing Parts" for your computer type). If no replacement drive is immediately available and the drive is not

Error Message	Description
	the only bootable drive, enter System Setup and change the appropriate drive setting to **None**. Then remove the drive from the computer.
Write fault	The operating system cannot write to the floppy or hard drive.
Write fault on selected drive	The operating system cannot write to the floppy or hard drive.
X:\ is not accessible. The device is not ready	The floppy drive cannot read the disk. Insert a floppy disk into the drive and try again.

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Specifications

Technical Specifications

> NOTE: Offerings may vary by region. For more information regarding the configuration of your computer, click Start (or Start in Windows XP) Help and Support, and then select the option to view information about your computer.

Processor	
Processor type:	• Intel Core i3 series • Intel Core i5 series • Intel Core i7 series • Intel Xeon E3–1200 series
Total Cache	Up to 8 MB cache depending on processor type

Memory	
Type	DDR3
Speed	1333 MHz
Connectors	four DIMM slots
Capacity	1 GB, 2 GB, 4 GB, and 8 GB
Minimum Memory	1 GB
Maximum memory	32 GB

Video

Integrated:	• Intel HD Graphics 2000/3000 (with Intel Core i3 DC 65 W and Intel Core i5/i7 QC vPRO 95 W-class CPU-GPU combo)
Discrete	PCI Express x16 graphics adapter

Audio

Integrated	four Channel High Definition Audio

Network

Integrated	Intel 82579LM Ethernet capable of 10/100/1000 Mb/s communication

System Information

System Chipset	Intel C206 Series Express Chipset
DMA Channels	two 82C37 DMA controllers with seven independently programmable channels
Interrupt Levels	Integrated I/O APIC capability with 24 interrupts
BIOS Chip (NVRAM)	80 MB (10 MB)

Expansion Bus

Bus Type	PCI 2.3, PCI Express 2.0, SATA 3.0 and 2.0, USB 2.0
Bus Speed:	PCI Express:
	• x1-slot bidirectional speed – 500 MB/s
	• x16-slot bidirectional speed – 16 GB/s
	SATA: 1.5 Gbps, 3.0 Gbps, and 6 Gbps

Cards

PCI	up to one full-height card
PCI Express x1	up to three full-height cards

Cards

PCI-Express x16	up to two full-height cards
Mini PCI Express	none

Drives

Externally Accessible (5.25–inch drive bays)	two
Internally Accessible:	
3.5–inch SATA drive bays	two
2.5–inch SATA drive bays	two

External Connectors

Audio:	
Back Panel	two connectors for line-out and line-in/microphone
Front Panel	two connectors for microphone and headphone
Network Adapter	one RJ45 connector
Serial	one 9-pin connector; 16550C compatible
Parallel	one 25-pin connector (optional for mini-tower)
USB 2.0	
Front Panel	four
Back Pane	six
Video	15-pin VGA connector, 20-pin DisplayPort connector

NOTE: Available video connectors may vary based on the graphics card selected.

System Board Connectors

PCI 2.3 data width (maximum) — 32 bits	one 120-pin connector
Mini-Tower, Desktop	
PCI Express x1 data width (maximum) — one PCI Express lane	one 36-pin connector
PCI Express x16 (wired as x4) data width (maximum) — four PCI Express lanes	one 164-pin connector
PCI Express x16 data width (maximum) — 16 PCI Express lanes	one 164-pin connector
Mini PCI Express data width (maximum) — one PCI Express lane and one USB interface	none
Serial ATA	four 7-pin connectors
Memory	four 240-pin connectors
Internal USB	one 10-pin connector
System Fan	one 5-pin connector
Front panel control	one 34-pin and one 5-pin connector
Thermal Sensor	one 2-pin connector
Processor	one 1155-pin connector
Processor Fan	one 5-pin connector
Service mode jumper	one 2-pin connector
Password clear jumper	one 2-pin connector
RTC reset jumper	one 2-pin connector
Internal speaker	one 5-pin connector
Intruder connector	one 3-pin connector
Power connector	one 24-pin and one 4-pin connector

Controls and Lights

Front of the computer:

Power button light	Blue light — Solid blue light indicates power-on state; blinking blue light indicates sleep state of the computer.
	Amber light — Solid amber light when the computer does not start indicates a problem with the system board or power supply. Blinking amber light indicates a problem with the system board.
Drive activity light	Blue light — Blinking blue light indicates that the computer is reading data from or writing data to the hard drive.
Diagnostic lights	Four lights located on the front panel of the computer. For more information on the diagnostic lights, see the Service Manual at support.dell.com/manuals.

Back of the computer:

Link integrity light on integrated network adapter	green — a good 10 Mbps connection exists between the network and the computer.
	orange — a good 100 Mbps connection exists between the network and the computer.
	yellow — a good 1000 Mbps connection exists between the network and the computer.
	off (no light) — the computer is not detecting a physical connection to the network.

Controls and Lights

	Network activity light on integrated network adapter	yellow light — A blinking yellow light indicates that network activity is present.
	Power supply diagnostic light	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. ✍ **NOTE:** You can test the health of the power system by pressing the test button. When the system☐ power supply voltage is within specification, the self-test LED lights up. If the LED does not light up, the power supply may be defective. AC power must be connected during this test.

Power	Wattage	Maximum Heat Dissipation	Voltage
	265 W	1390 BTU/hr	100 VAC to 240 VAC, 50 Hz to 60 Hz, 5.0 A
Coin-cell battery	3 V CR2032 lithium coin cell		

✍ **NOTE:** Heat dissipation is calculated by using the power supply wattage rating. See the safety information that shipped with your computer for important voltage–setting information.

Physical	Height	Width	Depth	Weight
	36.00 cm (14.17 inches)	17.50 cm (6.89 inches)	41.70 cm (16.42 inches)	8.87 kg (19.55 lb)

Environmental

Temperature range:

	Operating	10 °C to 35 °C (50 °F to 95 °F)
	Storage	−40 °C to 65 °C (−40 °F to 149 °F)

Relative humidity (maximum):

	Operating	20% to 80% (non-condensing)
	Storage	5% to 95% (non-condensing)

Maximum vibration:

	Operating	0.26 GRMS
	Storage	2.2 GRMS

Maximum shock:

	Operating	40 G
	Storage	105 G

Altitude:

	Operating	140 G
	Storage	163 G

Airborne contaminant level	G1 or lower as defined by ANSI/ISA-S71.04-1985

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Contacting Dell

Contacting Dell

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

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

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