



# ***Desktop APM for NT***

## ***User's Guide***

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# *Introduction*

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Desktop APM for NT provides power management functionality for desktop computer systems running Windows NT 4.0. The computer may be a Windows NT 4.0 workstation or server system. A BIOS-independent power management solution, Desktop APM for NT helps reduce the power consumption of the computer system thereby saving overall operating cost. Fundamentally, Desktop APM for NT provides-independent power management under Windows NT 4.0. In addition, applications that are power managed under Windows 95 are now power managed under Windows NT.

Desktop APM for NT uses a convenient graphical user interface that lets you access a variety of power management functions. By glancing at a single dialog box, you can control when your display and hard disk should power down. In addition, you can be informed before your desktop goes into suspend mode. Desktop APM for NT offers advanced power management functionality for workstation and server systems.

## *Features*

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Desktop APM for NT runs on any desktop computer and offers several advantages that Windows NT system does not provide. Desktop APM for NT includes the following functionality:

- Handles power management events and messages.
- Detects when the system is idle and reduces power consumption during these periods.
- Supports display and hard disk power down during idle periods. Powering down the display reduces power consumption and increases the life of the screen more than running a screen saver.
- Broadcasts power management messages to applications.
- Updates the system date and time when resuming from Suspend mode.
- Complies with the Win32 power management API requirements.
- Provides a seamless 32-bit APM connection with the 32-bit Windows NT services.
- Complies with APM specifications, versions 1.0, 1.1, and 1.2.
- Provides German, French, Italian, Spanish, and Japanese international language support.
- Works with either uni-processor or multi-processor Windows NT 4.0 workstation or server systems.

## *Audience*

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This document is designed for portable computer users who are familiar with Windows conventions and terminology and who want to:

- Use power management features of Windows 95 on NT machines
- Configure their machines to achieve maximum power management use of system devices
- Implement a BIOS-independent power management solution

## Contents of this Manual

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The *Desktop APM for NT User's Guide* contains the following chapters:

**Chapter 1 Installing and Setting Up Desktop APM for NT:** describes how to install the product and defines system requirements.

**Chapter 2 Using Desktop APM for NT:** describes the basic features of the Desktop APM for NT user interface.

**Chapter 3 Power Management Modes:** describes the power management modes and how component devices can be power managed.

**Appendix A Desktop APM for NT Drivers and Messages:** describes the power management device drivers that Desktop APM for NT installs and messages you might encounter as you install and run Desktop APM for NT.

**Glossary:** includes definitions for various terms used in this manual.

## Conventions and Typefaces Used in This Manual

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Choose	Within this manual, the term <i>choose</i> means to select a menu item by highlighting it with the cursor and pressing <b>&lt;Enter&gt;</b> or clicking on it.
<b>SETUP</b> <b>&lt;Enter&gt;</b>	Boldfaced courier type indicates text as it appears on the screen or in a program. It is used in text for instructions and for anything you must type literally (such as <b>A:\SETUP</b> to install a program).
<b>KEY1+KEY2</b>	This indicates a command that requires you press <b>KEY1</b> and hold it down as you press <b>KEY2</b> .
<b>Bold text</b>	Within text, bold-faced type indicates menu options and commands.
<i>Italic text</i>	Within text, italics indicate placeholders, class names, variables, and arrays. In syntax expressions, placeholders represent information that you must provide.
SETUP.EXE	Within text, capital letters represent the names of files and directories.

## Additional Information

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For additional information about Desktop APM for NT and other products, visit our World Wide Web home page at <http://www.phoenix.com>.

# *Chapter 1 Installing and Setting Up Desktop APM for NT*

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Installing the Desktop APM for NT involves using the Desktop APM for NT installation program, verifying information about the Desktop APM for NT program after the software is installed, and configuring a shortcut desktop icon to display on the Windows NT desktop.

This chapter describes:

- Installing the Desktop APM for NT software
- Un-Installing the Desktop APM for NT software
- Upgrading from a previous version of Desktop APM for NT
- Verifying information about your version of the Desktop APM for NT program

To begin installing the components, however, your system must meet certain system requirements.

## *System Requirements*

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The recommended minimum system for running Desktop APM for NT includes the following components:

- A 486 or Pentium computer
- Microsoft Windows NT 4.0 (Workstation or Server)
- At least 5MB of free hard disk space available on your computer

## *Installing the Desktop APM for NT Software*

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Before you install Desktop APM for NT, back up the following Windows NT files:

- HAL.DLL
- DISK.SYS
- ATAP.SYS

If you already have a previous version of Desktop APM for NT installed in the system, refer to the section, “Upgrading the Desktop APM for NT Software,” later in this chapter for instructions on upgrading your system to the latest version of Desktop APM for NT.

To install Desktop APM for NT for the first time on a system:

1. Insert Disk 1 of the Desktop APM for NT software into drive A:  
**Note:** If your installation medium is a CD-ROM, then insert the CD-ROM into the CD-ROM drive.
2. Click the **Start** button on the Windows NT Taskbar.
3. Choose **Run...** and enter **A:\SETUP.EXE**.  
**Note:** If your installation medium is a CD-ROM, use the drive letter of the CD-ROM drive instead of A:\.
4. Follow the directions displayed in the Desktop APM for NT installation program. Specify a pathname in which you want Desktop APM for NT to be installed.
5. Restart your system when prompted by the setup program. Once the system is running again, you can use the Desktop APM for NT software.

The installation program backs up and then overwrites the HAL file. In addition, the installation program automatically places an icon, Desktop APM for NT, in the Windows NT Control Panel.

## *Un-Installing the Desktop APM for NT Software*

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If you already have a version of Desktop APM for NT installed in the system, you can un-install that version using the following the steps:

1. Insert Disk 1 of the Desktop APM for NT software into drive A:  
**Note:** If your installation medium is a CD-ROM, then insert the CD-ROM into the CD-ROM drive.
2. Click the **Start** button on the Windows NT Taskbar.
3. Choose **Run...** and enter **A:\UNINSTL.EXE**.  
**Note:** If your installation medium is a CD-ROM, use the drive letter of the CD-ROM drive instead of A:\.
4. Follow the directions displayed in the Desktop APM for NT un-installation program.
5. Restart your system when prompted by the Setup program.

The un-installation program cannot automatically remove any shortcuts that you may have created while running Desktop APM for NT. You must manually remove any shortcuts to the Desktop APM for NT program by dragging the shortcut icon to the Recycle Bin.

## *Upgrading from a Previous Version of Desktop APM for NT*

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If you already have a version of Desktop APM for NT installed in the system, you must upgrade your system to the current version of Desktop APM for NT.

1. Un-install the previous version of Desktop APM for NT software. Follow the steps outlined in the section, “Uninstalling the Desktop APM for NT Software,” earlier in this chapter.
2. After the system has been restarted, you can install Desktop APM for NT. Follow the steps outlined in the section, “Installing the Desktop APM for NT Software,” earlier in this chapter. You can use these steps because you have already un-installed the previous version of Desktop APM for NT.
3. Restart the system. Now you can use Desktop APM for NT.

## *Using DeskPower with Multiprocessor Systems*

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Desktop APM for NT is designed to work with multiprocessor systems. A multiprocessor system is one that has more than one processor. To install DeskPower on a uniprocessor or multiprocessor system, follow the directions given in the section, “Installing the Desktop APM for NT Software,” earlier in this chapter. No additional installation instructions are required.

If Desktop APM for NT was installed on a system with only one processor and you wish to upgrade your system with additional processors, the complete the following steps:

1. Ensure that your system supports the addition of multiple processors.
2. Follow your system instructions for adding additional processors in your system.
3. Follow the instructions in the Microsoft Windows NT Resource Kit for upgrading the number of processors in your system. This typically involves running the Microsoft utility UPTOMP.EXE.
4. Restart your system.
5. Log in to Windows NT. A dialog box appears on the screen indicating that one or more processors have been added to the system.
6. Click **OK** to run the Desktop APM for NT installation program again. The installation program updates Desktop APM for NT to run with more than one processor. Restart your system to complete the installation.

## *Verifying Information About Desktop APM for NT*

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After you install all the software components and Desktop APM for NT, it is a good idea to verify the version number and other information about the Desktop APM for NT program.

To verify information about Desktop APM for NT:

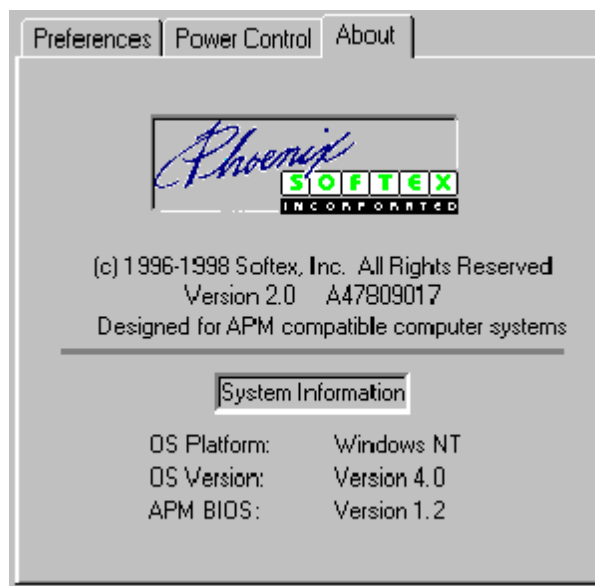
1. From the Windows NT Taskbar, choose **Start**, then **Settings**, then **Control Panel**. The Windows NT Control Panel appears.
2. From the Windows NT Control Panel, click on the **Desktop APM for NT** icon with the right mouse button. A drop-down list box appears. Select **Open** from the drop-down list box to display the Desktop APM for NT control panel.

or

Double-click on the Desktop APM for NT icon in the Control Panel. The Desktop APM for NT control panel appears.

3. Choose the **About** tab. The About tab page appears with statistics about the Desktop APM for NT software. (See Figure 1.)

**Figure 1. About Tab Page on the Desktop APM for NT Control Panel**



As a shortcut for verifying information about the Desktop APM for NT program, double-click on the cord icon on the Windows NT Taskbar.

## Chapter 2 Using Desktop APM for NT

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Desktop APM for NT gathers critical information from your portable computer, processes it, and displays the information on the screen in a format that is easy to understand. This chapter describes the following features of the Desktop APM for NT user interface:

- Taskbar icon
- Tabbed dialog boxes
- Power management features

To view the tabbed dialog boxes, double-click the left mouse button on the power management icon on the Taskbar, or double-click the left mouse button on the Desktop APM for NT desktop icon.

### Using the Power Management Taskbar

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The user interface consists of a power management icon on the Taskbar and the tabbed dialog boxes that display power management controls and settings.

**Figure 2. Power Management Icon**



From the Windows NT Taskbar, you can perform the following tasks:

- To display power status information as a tooltip, position the mouse pointer over the Taskbar icon.
- To display the Desktop APM for NT Control Panel, double click the left mouse button.
- To enter Suspend mode, double click the right mouse button.

### Viewing the Power Management Information

---

To view Power Management information, open Desktop APM for NT and navigate through the individual tabbed pages. Some of the pages function as dialog boxes in which you can select power management options; others display power management information.

To access the Desktop APM for NT tabbed pages:

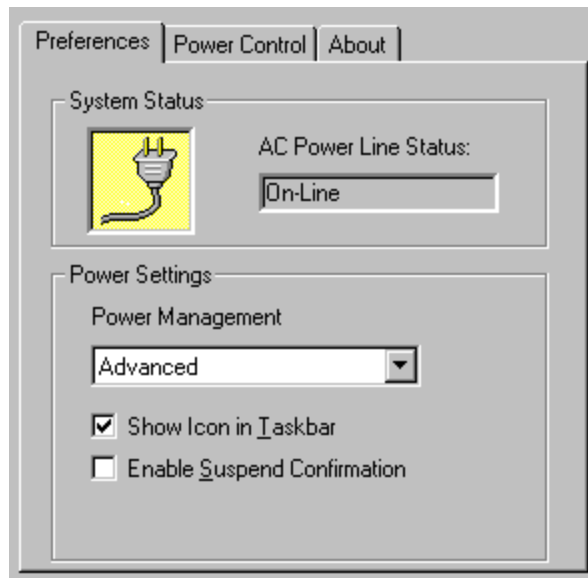
1. From the Windows NT Control Panel, double-click the left mouse button on the Desktop APM for NT icon

or

Double-click the left mouse button on the Desktop APM for NT icon in the Taskbar.

2. Click the folder tabs to move through the Desktop APM for NT power management dialog boxes.

**Figure 3. Desktop APM for NT Power Management Dialog Box**



## *Viewing and Setting Power Management Preferences*

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The Preferences page displays the System Status information and allows you to change power management settings and user preferences. These settings change the level of power management in the system.

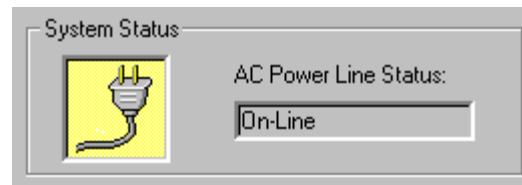
### *System Status Information*

---

On the top half of the Preferences page, Desktop APM for NT displays the following information:

- A plug icon to the left of the AC Power Line Status box
- The AC Power Line Status, which indicates whether the computer is plugged in.

Figure 4. System Status



## Changing Power Settings

You can change system power settings and enable the display of system power management messages using the Power Settings section of the Preferences page. You can activate one or more of the following options:

- Power Management Level
- Taskbar icon
- System Suspend confirmation message

You can adjust the power management level at which your desktop computer operates. There are three levels:

- **Advanced** — Desktop APM for NT and the BIOS work together to achieve maximum system power savings. This capability is present only in the systems that support the *Advanced Power Management Interface*.
- **Standard** — Low form of power management in which suspend mode does not fully reduce power consumption of the system. This capability is present only in systems that do *not* support the *Advanced Power Management Interface*.
- **Off** — Power Management mode is disabled. No power management is in effect. The system continues to use full power for all devices.

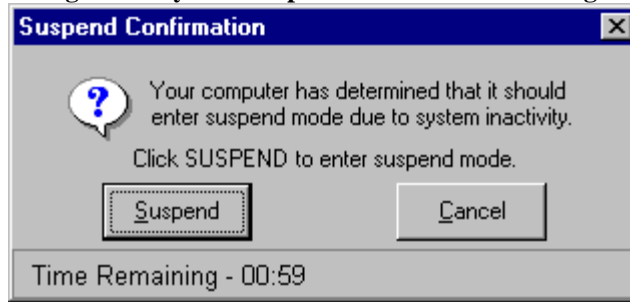
By modifying the option **Show Icon in Taskbar**, you can enable or disable the display of the Desktop APM for NT icon in the Taskbar. You may want to disable the display of the icon if there are too many items in your Taskbar.

On certain desktop computers, you have the ability to enable the System Suspend confirmation message from the Settings property page. If you enable this message, Desktop APM for NT displays a notification message before your system enters Suspend mode. (See Figure 5.) When this message appears:

1. Click Suspend to enter Suspend mode.
2. Click Cancel to resume normal system operation.

If this message is ignored, the system automatically enters Suspend mode after 59 seconds have elapsed since the message first appeared. Refer to Chapter 3 for detailed information about Suspend mode.

Figure 5. System Suspend Confirmation Message



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## Changing System Power Management Timeouts

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The Settings page lets you enable or disable the energy saving features of Desktop APM for NT. (See Figure 7.) In addition, you can specify the amount of time the system should be inactive before power management of certain devices takes effect. The three energy saving features you can change are:

- Display power down
- Hard Disk power down
- System Suspend mode

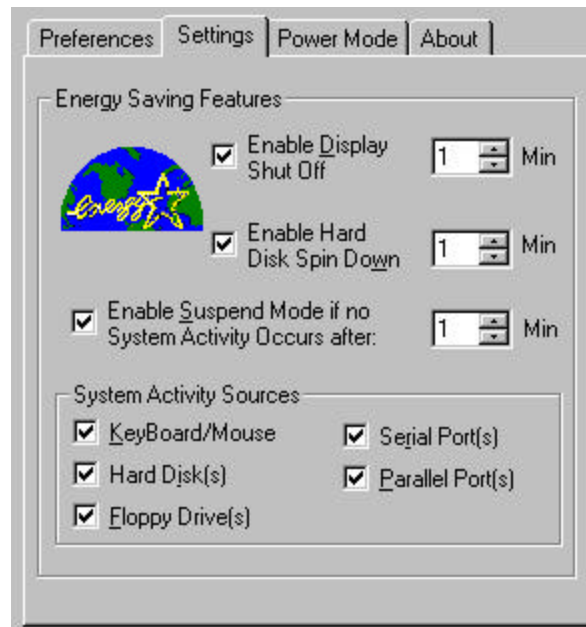
By checking **Enable Display Shut Off**, you can enable the shut down of your desktop monitor when the system is not in use. This feature lets you set the amount of the time your system must be inactive before Desktop APM for NT shuts off your monitor. For **Display Shut Off**, only keyboard and mouse activity are monitored. If you do not move your mouse or touch the keyboard for the amount of time shown in the dialog box, your screen display will be powered down to save energy.

By checking **Enable Hard Disk Spin Down**, you can enable the power down of your computer's hard disk when the hard disk is not in use. The hard disk automatically turns on again when it is needed — for example, to save a word processor file. This option lets you set the amount of time your hard disk must be inactive before Desktop APM for NT powers down your hard disk.

By checking **Enable Suspend Mode...**, you can enable the use of Suspend mode on your desktop. When the system is in Suspend mode, the maximum amount of power savings is in effect on your computer. In some cases this means that all processing on your computer is suspended until the machine is brought out of Suspend mode.

On certain systems, you must enable Suspend mode and Suspend settings through your system BIOS settings. Refer to your computer user's manual to determine if this task needs to be done. When **Enable Suspend Mode...** is checked, the system enters Suspend mode if activity occurs after the amount of time specified in the dialog box. Desktop APM for NT determines if the system is inactive by monitoring the devices selected in the System Activity Sources section. By default all the major system devices are monitored to determine if the system is active. In some cases, however, you may choose to tell Desktop APM for NT to ignore certain devices when deciding if the system is inactive.

Figure 6. Power Settings Page



## *Forcing Your Computer Into an Energy Savings Mode*

The Power Mode page shown in Figure 7 lets you force your computer into one of two energy savings modes:

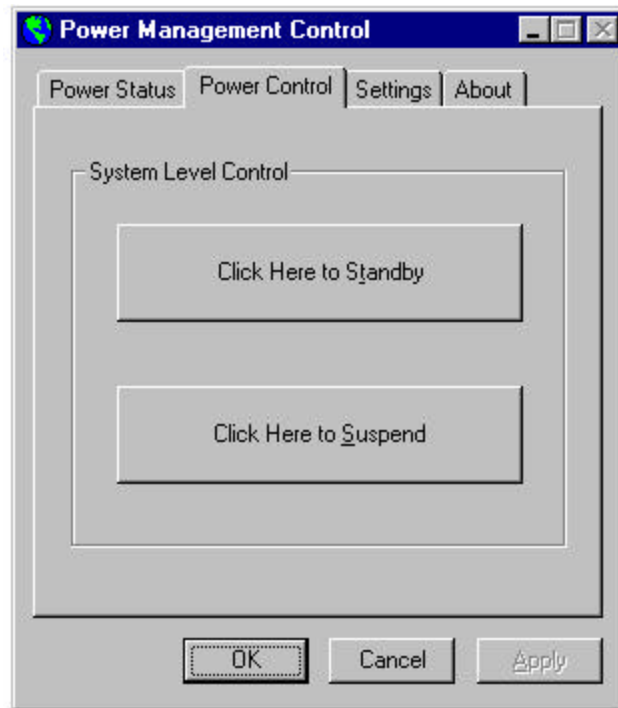
- Standby
- Suspend

In Standby mode, the computer's power consumption is reduced from the full power-on state. The amount of power savings varies depending on the computer. Typically, in Standby mode, the display and hard disk are put into a power-down mode.

In Suspend mode, the computer is put into the maximum power-savings mode. Similar to Standby mode, the amount of power savings varies depending on the computer. Typically, in Suspend mode, the display, hard disk, keyboard, mouse, CPU, and motherboard are powered down. To force your system into suspend mode, position the cursor over the Taskbar icon and double-click the right mouse button. (See Figure 2.)

Refer to your computer user's manual for more information on each of these modes.

**Figure 7. Power Mode Page**



# Chapter 3 Power Management Modes

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From the user interface, you can select the power management modes that Desktop APM for NT implements. This chapter describes those modes and the types of components and devices that can be power managed. The specific devices that can be power managed depend on your system configuration.

Desktop APM for NT provides both system-wide power management and automatic component power management. System-wide power management involves controlling the power usage of the system as a whole by changing the power consumption based on inactivity timers. Component power management, such as device Standby, provides power management of individual components. High-powered component management, such as the video subsystem and the hard disk motor, contribute significantly to power savings.

With Desktop APM for NT, you can control system-wide power management through the Desktop APM for NT Control Panel. Component power management settings can be controlled from the settings on the BIOS setup screen for your desktop computer. For information about your computer's setup options, refer to your desktop computer user's manual.

## System Power Management

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A system with power management capabilities can control power to devices to achieve maximum performance and energy savings.

Desktop APM for NT communicates with the power management component in the BIOS, controlling power to various devices such as the parallel and serial ports, the hard disk drive, and the monitor.

### On Mode

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The default system mode, On Mode, is the normal state of the system. If power management is disabled, the system remains in this state until power is turned off. The CPU runs at the speed specified in the BIOS SETUP screen. In addition, each component operates according to the power consumption constraints specified in the BIOS SETUP screen.

### Idle Mode

---

Idle mode is a system mode that detects the lack of CPU and system activity and then, automatically switches CPU speed. When no system activity occurs, the CPU speed is automatically dropped to an idle speed, also referred to as CPU Idle. When system activity resumes, the CPU runs at the maximum speed specified in the BIOS SETUP screen.

Desktop APM for NT communicates with the APM BIOS idle function to slow or stop the processor clock during any CPU idle period.

## *Standby Mode*

---

Standby mode controls the power to specific OEM-defined devices when there is a lack of system or device activity. The devices can include keyboard, CPU, video subsystem, mouse, hard drive, floppy drive, serial and parallel ports. When the system enters Standby mode, the hard disk and video enter a low power state, and the CPU clock and the processor are stopped.

Standby attempts to reduce maximum power consumed by the system short of a full system Suspend. The CPU clock is reduced to the Standby CPU speed specified in the BIOS SETUP or, system permitting, the CPU clock is stopped. Any system activity returns the system to the power ON state.

**Note:** Certain desktop computers may not support Standby mode. Refer to your computer user's manual for instructions on settings the Standby timeout and other device timeouts.

## *Suspend Mode*

---

The system enters suspend mode when no system activity occurs or if there is no user request through hardware or software. These events cause the Auto Suspend timer to time out. In addition, the user can force the system to enter Suspend mode at any time by pressing the Suspend/Resume HotKey.

After the user presses a Suspend/Resume key, the system returns to the full power-on state from Suspend mode within a few seconds. Upon a request to resume, the BIOS restores the states of all the devices and returns control to the application that was active when the system entered Suspend mode.

Currently, under Windows NT, system time is not updated after the computer resumes from Suspend mode. As a result, when the computer resumes from Suspend mode, the system time that is displayed on screen and used to time-stamp files is inaccurate. However, Desktop APM for NT conveniently updates the time stamp for all applications and files.

## *Off Mode*

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Off mode prevents all power from being supplied to the system. Pressing the power on button restores power to the system.

## *Component Power Management*

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When the system enters Standby mode, various component devices can be power-managed depending on the configuration of the individual system. This section describes a generic type of component power management. Refer to your portable computer user's manual to find out which components can be power-managed and how to set the timeouts for each device.

## *Disk Subsystem*

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A user-defined timeout value determines the amount of time the hard disk drive must be idle before the spindle motor is turned off. Any disk access restarts the hard disk motor and brings the disk subsystem back to full power mode. Power to the drive can be completely turned off by the power management application if this control is available in the hardware platform.

## *Video Subsystem*

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A user-defined time-out determines when to power down the video panel and backlight. The power state is controlled by keyboard and or mouse activity, or both. If no keyboard or mouse activity occurs for the specified time period, the monitor is turned off. The video panel and backlight are turned on again by any keyboard or mouse activity.

## *Serial Ports*

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Power management of the Serial ports (COM1 and COM2/Modem) can be enabled by specifying a time-out value. If a time-out value is specified, the port is powered down after the specified time of inactivity is reached. If serial port power management is disabled, power to the port is disabled until a request to access the port is received. Once the port is active, power remains on at all times regardless of the time-out value or inactivity.

## *Diskette Drive*

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Power management of the floppy disk can be enabled or disabled. When power management is enabled, the disk drive controller can be placed into low power mode

## *Parallel Port*

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The parallel port power management can be enabled by specifying a time-out value. If parallel port power management is disabled, the port remains active at all times. If a time-out value is specified, the port is powered down after the time of inactivity has elapsed.

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# Appendix A Power Management Drivers and Messages

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This chapter describes the Desktop APM for NT drivers and driver installation messages. Desktop APM for NT automatically loads several device drivers that transmit power management information to and from the BIOS. Table 1 lists the device drivers that support power management functionality and enable the Desktop APM for NT software to communicate with the operating system. Depending on the configuration of your system, one or more of these drivers are installed.

**Table 1. Desktop APM for NT Drivers**

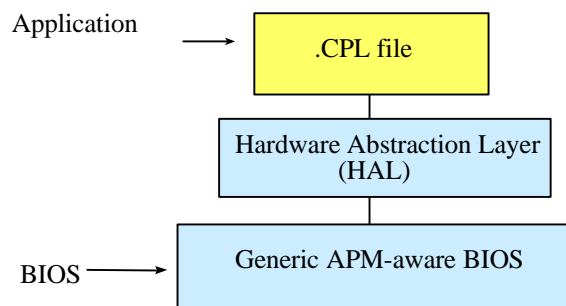
Name	Description
HAL	Desktop APM for NT installs a customized version of Windows NT Hardware Abstraction Layer (HAL) which, together with the Windows NT kernel drivers, communicates power management messages to the APM BIOS.
POWER.SYS	An APM driver that Desktop APM for NT installs. POWER.SYS provides communication services between Desktop APM for NT, the BIOS power management services, and various device drivers
POWER.DLL	Desktop APM for NT installs POWER.DLL to communicate power management events to the Win32 subsystem.

## Desktop APM for NT Components

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Desktop APM for NT communicates with the Hardware Abstraction Layer (HAL), which interacts with a generic, APM-aware BIOS to implement power management events. The following diagram illustrates the relationship among Desktop APM for NT, HAL, and the BIOS.

**Figure 8. Desktop APM for NT Components**



## Driver Installation Messages

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Table 2 lists any driver installation messages you might encounter while installing or running Desktop APM for NT.

**Table 2. Driver Installation Messages**

<b>Message</b>	<b>Solution</b>
Cannot find entry point HALCallAPM32 in HAL.DLL	The HAL file required by Desktop APM for NT has been replaced by another HAL file. This can typically happen during the upgrade process. Re-run SETUP.EXE and re-install the Desktop APM for NT software.

# Glossary

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## **Advanced Power Management (APM) BIOS**

A logically-related group of routines that perform power management services. Using APM functionality, the Operating System (OS) and the Power Management (PM) system can communicate so as to reduce power consumption. For example, the OS can request that the PM place the computer in Suspend mode.

## **Advanced Power Management (APM) 1.2**

Jointly authored by Intel and Microsoft, the APM Specification 1.2 defines the requirements and functionality of a software layer that supports power management and communicates with power manageable hardware devices. Desktop APM for NT provides the functionality listed in the APM specification 1.2.

## **Driver**

Also referred to as a device driver, a driver is a set of software routines that enable the operating system to talk to a device such as a printer.

## **Hardware Abstraction Layer (HAL)**

A set of Windows NT drivers designed to communicate power management messages to the APM-aware BIOS.

## **Standby Mode**

A mode in which the system saves power. In Standby mode, certain system devices, including the keyboard, CPU, video system, mouse, and floppy drive, can be powered down. Any system activity, for example, a modem ring or the press of a key, returns the system to the power-on state.

## **Suspend Mode**

A power-saving mode, Suspend mode is triggered by a lack of system activity or a user request through hardware or software. When the system enters Suspend mode, it either saves the system to DRAM (Standard mode) or Save-to-Disk.

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