



# **Intel® 800 Series Chipset Family**

---

## **Common System Configuration Issues Using the Intel® Ultra ATA Storage Driver and Intel® Chipset Software Installation Utility**

*Revision 3.0  
May, 2001*

Shane K.  
System Software Support Engineer  
Intel Customer Support

---

---

## Revision History

Rev	Comments	Date
1.0	Initial Release	19 Nov 99
2.0	Added Windows* 2000 information; Registry access error message	18 May 00
2.1	Added Intel® 815, Intel® 815E, and Intel® 820E Chipsets	19 Jun 00
3.0	Added Windows Me, and Intel® 850/810E2/815EP/815P/860 Chipsets	22 May 01

## DISCLAIMER

Information in this document is provided in connection with Intel products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life-sustaining applications.

Intel may make changes to specifications and product descriptions at any time, without notice.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

\* Other brands and names may be claimed as the property of others.

Copyright © Intel Corporation 2001

1.	SCOPE OF THIS DOCUMENT .....	5
2.	HOW TO IDENTIFY THE OPERATING SYSTEM VERSION .....	5
3.	HOW TO IDENTIFY THE INTEL CHIPSET .....	7
4.	INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY FOR INTEL CHIPSETS .....	8
4.1	DESCRIPTION.....	8
4.2	DO YOU NEED THE INTEL CHIPSET SOFTWARE INSTALLATION UTILITY?.....	8
4.3	OBTAINING AND INSTALLING THE INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY .....	9
4.4	CONFIRMING THE INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY IS INSTALLED .....	10
5.	TROUBLESHOOTING.....	11
5.1	<i>Symptom:</i> System Locks Up During Restart.....	11
5.2	<i>Symptom:</i> After Reboot, Windows* Cannot Find ESDI_506.PDR File .....	11
5.3	<i>Symptom:</i> After Reboot, Windows Cannot Find UHCD.SYS, USBD.SYS, and/or USBHUB.SYS Files .....	11
5.4	<i>Symptom:</i> After Reboot, Windows Cannot Find ISAPNP.VXD File.....	11
6.	INTEL® ULTRA ATA STORAGE DRIVER.....	12
6.1	DESCRIPTION.....	12
6.2	DO YOU NEED THE INTEL® ULTRA ATA STORAGE DRIVER?.....	12
7.0	OPTION FOR USERS WITH WINDOWS* 95 AND/OR INTEL® 440XX/430XX CHIPSET.....	12
8.	USING THE INTEL® ULTRA ATA STORAGE DRIVER.....	13
8.1	SYSTEM REQUIREMENTS.....	13
8.2	STEPS TO TAKE BEFORE INSTALLING THE INTEL ULTRA ATA STORAGE DRIVER .....	13
8.3	RESOLVE CONFLICTS IN DEVICE MANAGER.....	13
8.4	OBTAINING AND INSTALLING THE INTEL® ULTRA ATA STORAGE DRIVER .....	14
8.5	UNATTENDED INSTALLATION UNDER WINDOWS NT* 4.0 .....	14
8.6	INSTALLATION UNDER WINDOWS* 2000.....	15
8.7	ISSUES DURING INSTALLATION .....	16
8.7.1	<i>Symptom:</i> Incompatible Hardware .....	16
8.7.2	<i>Symptom:</i> Operating System Not Supported.....	16
8.8	DMA CHECKBOX SETTING NOT AVAILABLE IN WINDOWS* 98.....	17
8.9	CONFIRMING THE INTEL ULTRA ATA STORAGE DRIVER FOR WINDOWS* 98 IS INSTALLED.....	18
8.10	CONFIRMING INTEL ULTRA ATA STORAGE DRIVER FOR WINDOWS NT* 4.0 IS INSTALLED .....	19
8.11	WINDOWS NT 4.0 SCSI ADAPTERS 'DRIVERS' TAB INDICATES 'NOT STARTED'.....	20
8.12	UNINSTALLING THE INTEL ULTRA ATA STORAGE DRIVER .....	21
8.13	WINDOWS* 98 AND WINDOWS 98 SECOND EDITION (SE) .....	21
8.14	WINDOWS NT* 4.0.....	21
9.	INTEL® ULTRA ATA COMPANION .....	22
9.1	DESCRIPTION.....	22
9.2	USING THE INTEL® ULTRA ATA COMPANION.....	22
9.3	PRIMARY CHANNEL MASTER DEVICE.....	24
9.4	UNPOPULATED MASTER/SLAVE ON PRIMARY OR SECONDARY CHANNEL .....	24
9.5	CHANGING TRANSFER MODE LIMIT PARAMETERS.....	25
9.6	INDEPENDENT CONFIGURATION OF DIFFERENT DEVICES ON THE SAME CABLE.....	26
9.7	THEORETICAL TRANSFER RATES ASSOCIATED WITH TRANSFER MODES .....	29
9.8	GENERATE AND VIEW A REPORT USING THE INTEL ULTRA ATA COMPANION .....	31
9.9	EXAMPLE OF GENERATED REPORT USING THE INTEL ULTRA ATA COMPANION.....	31
10.	ULTRA ATA/66 AND ULTRA ATA/100 .....	34
10.1	DESCRIPTION .....	34
10.2	SYSTEM REQUIREMENTS.....	34
11.	40 PIN, 80-CONDUCTOR IDE CABLE .....	34
11.1	DESCRIPTION .....	34
11.2	DO I NEED TO HAVE A 40 PIN, 80-CONDUCTOR IDE CABLE FOR ULTRA ATA/66 AND ATA/100?.....	34
11.3	TROUBLESHOOTING.....	35
11.3.1	<i>Symptom:</i> Intel Ultra ATA Companion Incorrectly Recognizes IDE Cable.....	35
11.3.2	<i>Symptom:</i> Unable to Update BIOS to Correctly Detect Cable Type.....	35
11.3.3	<i>Symptom:</i> System Will Not Boot with 40 Pin, 80-Conductor IDE Cable Installed .....	36
11.3.4	<i>Symptom:</i> System Performance is Slower Than Expected Using 1 Hard Drive and 1 CD-ROM.....	36
11.3.5	<i>Symptom:</i> Difficulty Recognizing Master/Slave Devices Installed on 40 Pin, 80-Conductor IDE Cable .....	36
11.3.6	<i>Symptom:</i> Registry Access Error Message in Windows* 98 and Windows 98 Second Edition (SE).....	36
11.3.7	<i>Symptom:</i> Corrupted Files when Using Norton* Speed Disk* .....	37
11.3.8	<i>Symptom:</i> 'Inaccessible Boot Device' in Windows* 2000 when Using Adaptec* Easy CD Creator* .....	37
11.3.9	<i>Symptom:</i> CD Recording Device Not Recognized by Adaptec* Easy CD Creator* .....	37

11.3.10	<i>Symptom:</i> 'Old or Out-of-Date Firmware' Error Message Appears in System Event Log .....	37
11.3.11	<i>Symptom:</i> High 'CPU utilization' Reported in HD Tach* Utility.....	37

## 1. Scope of This Document

This document discusses system configuration issues related to the use of the Intel® Chipset Software Installation Utility for the Intel® 810 chipset family, the Intel® 815 chipset family, the Intel® 820 chipset family, the Intel® 840 chipset, the Intel® 850 chipset, the Intel® 860 chipset and the Intel® Ultra ATA Storage Driver for Windows\* 98, Windows 98 Second Edition (SE), Windows Millennium Edition (Me), Windows 2000, and Windows NT\* 4.0.

The issues discussed in this guide are only relevant to systems using the Intel® 810, Intel® 810E, Intel® 810E2, Intel® 815, Intel® 815E, Intel® 815EP, Intel® 815P, Intel 820, Intel® 820E, Intel 840, Intel® 850, and Intel® 860 chipsets and Windows 98, Windows 98 Second Edition (SE), Windows Millennium Edition (Me), Windows 2000, or Windows NT 4.0 (any Service Pack). Please note that the Intel Chipset Software Installation Utility and the Intel Ultra ATA Storage Driver does NOT support Beta or pre-released versions of Windows operating systems.

Most of the issues contained in this document are related to either software configuration or hardware integration. Intel is not responsible for the software written by third party vendors or the implementation of Intel components in the products of third party manufacturers.

Customers should always contact the place of purchase or system/software manufacturer with support questions about their specific hardware or software configuration.

## 2. How to Identify the Operating System Version

To determine which version of Windows is installed on your computer, complete the following steps:

Click on Start Button / Settings / Control Panel



- Double-click on the System icon that appears in the following window:



- Located on the General tab, look for the operating system version, as shown below:



The version codes are translated in the following table:

Windows 98	4.10.1998	Original Retail Version
Windows 98 Second Edition (SE)	4.10.2222	Original Retail Version
Windows Millennium Edition (Me)	4.90.3000	Original Retail Version
Windows 2000	5.00.2195	Original Retail Version
Windows NT 4.0	Version 4.0 (Build 1381: Service Pack X)	Original Retail Version

### 3. How to Identify the Intel Chipset

If you are unsure which Intel chipset is located in your computer, you will need to look at the motherboard for the chipset markings.

**Note:** Some system manufacturers may void your warranty if you open the case. Check with the manufacturer if you have any concerns about this before proceeding.

**Caution:** Make sure you disconnect the power before opening the case. Avoid touching any of the components inside the system.

Intel® 800 series chipsets are comprised of multiple components. The key items to identify are the I/O Controller Hub (ICH), Memory Controller Hub (MCH), Graphics Memory Controller Hub (GMCH), and Firmware Hub (FWH) components. The tables below show the combinations that make up the various Intel chipsets that are supported by the Intel® Ultra ATA Storage Driver:

#### Intel Chipsets with Integrated Graphics

Intel Chipset	I/O Controller Hub (ICH)	Graphics Memory Controller Hub (GMCH)	Firmware Hub (FWH)
Intel® 810 chipset	82801AA or 82801AB	FW82810 or FW82810DC100	82802AB or 82802AC
Intel® 810E chipset	82801AA or 82801AB	FW82810E or FW82810DC100	82802AB or 82802AC
Intel® 810E2 chipset	82801AA or 82801AB	FW82810E or FW82810DC100	82802AB or 82802AC
Intel® 815 chipset	82801AA or 82801AB	FW82815	82802AB or 82802AC
Intel® 815E chipset	82801BA	FW82815E	82802AB or 82802AC
Intel® 815 chipset (B-step)	82801BA	FW82815B	82802AB or 82802AC

#### Intel Chipsets

Intel Chipset	Memory Controller Hub (MCH)	I/O Controller Hub (ICH)	Firmware Hub (FWH)
Intel® 815EP chipset	82815EP	82801BA	82802AB or 82802AC
Intel® 815P chipset	82815P	82801AA or 82801AB	82802AB or 82802AC
Intel® 820 chipset	82820	82801AA or 82801AB	82802AB or 82802AC
Intel® 820E chipset	82820	82801BA	82802AB or 82802AC
Intel® 840 chipset	82840	82801AA or 82801AB	82802AB or 82802AC
Intel® 850 chipset	82850	82801BA	82802AB or 82802AC
Intel® 860 chipset	82860	82801BA	82802AB or 82802AC

## 4. Intel® Chipset Software Installation Utility for Intel Chipsets

### 4.1 Description

The Intel® Chipset Software Installation Utility (formerly referred to as Intel® INF Installation Utility) for Intel chipsets was developed for updating certain versions of Windows\* 95, Windows 98, Windows Millennium Edition (Me), or Windows 2000. The Intel Chipset Software Installation Utility is not required or compatible with Windows NT\* 4.0. This utility allows the operating system to correctly identify the Intel chipset components and properly configure the system. The Intel Chipset Software Installation Utility installs specific Windows INF files. The INF files inform the operating system how to properly configure the chipset for specific functionality, such as AGP, USB, Core PCI, and ISA PnP services.

For more details about the specific INF files that are updated, please refer to the README.TXT file that is included with the Intel Chipset Software Installation Utility for Intel chipsets.

**Note:** It is important that your Intel chipset is properly configured prior to installing the Intel® Ultra ATA Storage Driver. If the Intel Chipset Software Installation Utility is needed, it should always be installed prior to installing the Intel Ultra ATA Storage Driver.

### 4.2 Do You Need the Intel Chipset Software Installation Utility?

Find your operating system version and Intel 800 series chipset family in the table below:

Intel 800 Series Chipset Family	Operating System Version				
	Windows 98 (4.10.1998)	Windows 98 SE (4.10.2222)	Windows NT 4.0 (Build 1381)	Windows 2000 (5.00.2195)	Windows Me (4.90.3000)
Intel® 810 chipset	YES	YES	N/A	NO	NO
Intel® 810E chipset	YES	YES	N/A	NO	NO
Intel® 810E2 chipset	YES	YES	N/A	NO	NO
Intel® 815 chipset	YES	YES	N/A	YES	NO
Intel® 815E chipset	YES	YES	N/A	YES	NO
Intel® 815EP chipset	YES	YES	N/A	YES	NO
Intel® 815P chipset	YES	YES	N/A	YES	NO
Intel® 820 chipset	YES	YES	N/A	NO	NO
Intel® 820E chipset	YES	YES	N/A	YES	NO
Intel® 840 chipset	YES	YES	N/A	NO	NO
Intel® 850 chipset	YES	YES	N/A	YES	YES
Intel® 860 chipset	YES	YES	N/A	YES	YES

"YES" indicates that the listed operating system version might not optimally configure the Intel chipset.

"NO" indicates that the operating system should optimally configure the Intel chipset. The Intel Chipset Software Installation Utility does not need to be run.

"N/A" indicates Not Applicable. Do not run the Intel Chipset Software Installation Utility.

You can confirm whether the Intel Chipset Software Installation Utility is needed by determining how Windows configures the Hard Disk Controller:

- Click on Start Button / Settings / Control Panel
- Double-click on the System icon
- Select the Device Manager tab and expand the listing for Hard disk controllers

If Windows did not configure the optimal Hard Disk Controller drivers, the following information will appear:



**Note:** If a "single fifo" notation appears after the Primary IDE controller listing, the system is not using the optimal driver.

If your system is configured like the above image, Windows did not optimally identify and configure the Intel chipset and you will need to install the Intel Chipset Software Installation Utility.

If yellow exclamation marks appear next to any devices under the Hard disk controllers listing, the Intel Chipset Software Installation Utility might correct the conflict(s). Try installing the Intel Chipset Software Installation Utility and see if the conflicts are resolved.

### 4.3 Obtaining and Installing the Intel® Chipset Software Installation Utility

The Intel® Chipset Software Installation Utility for Intel chipsets can be downloaded from the following Intel web site:

<http://developer.intel.com/design/software/drivers/platform/inf.htm>

The Intel Chipset Software Installation Utility (infirst\_enu.zip or infirst\_enu.exe) is available for all Windows Operating Systems with the Plug and Play feature. The infirst\_enu.zip file is approximately 1.3MB in size and the infirst\_enu.exe file is approximately 1.4MB in size. The infirst\_enu.zip file requires a compression utility such as WinZip\* or PKZip\* to unzip the file. The README.TXT file covers topics such as system requirements, contents of the distribution package, installation instructions, troubleshooting hints, and other notes. The RELNOTES.PDF file covers topics such as new features, fixes, and known issues for that Release. The USER'S MANUAL file covers topics such as installation instructions, troubleshooting hints, and other helpful information.

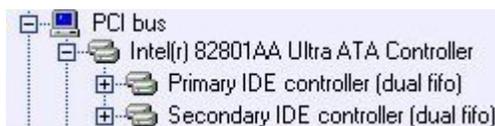
Please review the README.TXT document before installing the Intel Chipset Software Installation Utility.

Before installing the Intel Chipset Software Installation Utility for Intel chipsets, you should also confirm that all devices in the System Properties / Device Manager / Hard Disk Controllers listing are enabled. There should not be any yellow exclamation points or red "X"s, which could indicate a certain device is disabled or experiencing a driver conflict. The Intel Chipset Software Installation Utility may not work properly if there are devices in the system that are disabled.

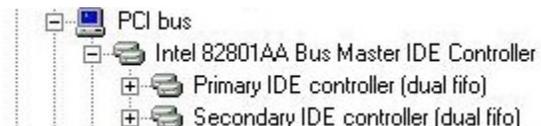
After the infirst\_enu.zip file has been unzipped to a directory on your hard drive, run the Setup.exe file. Once the Intel Chipset Software Installation Utility has completed setup, you must reboot your system. The first time you reboot, Windows\* 98 should detect new hardware and you might be prompted to reboot your system until all new hardware has been detected. After all the new hardware has been detected, verify that all the devices in Device Manager / Hard Disk Controllers have been optimally configured. Please refer to the next section for confirmation.

#### 4.4 Confirming the Intel® Chipset Software Installation Utility is Installed

After installing the Intel® Chipset Software Installation Utility, Device Manager should indicate that your system is now using the Intel Hard Disk Controller driver. Device Manager can be accessed by going to: Start Button / Settings / Control Panel / System / Device Manager. Select the radio button next to 'View devices by connection.' Expand the 'Plug and Play BIOS' listing, the 'PCI bus' listing, and then the 'Intel(r) 82801AA Ultra ATA Controller' or 'Intel 82801AA Bus Master IDE Controller.' The Hard Disk Controller listing should show the following:



**Intel® 810 and Intel® 810E Chipsets**



**Intel® 820 Chipset**

**Note:** This information will differ slightly if you already have the Intel® Ultra ATA Storage Driver installed. Please refer to the Section titled "Confirming the Intel Ultra ATA Storage Driver for Windows\* 98/Windows NT\* 4.0 is Installed" to verify installation of the Intel Ultra ATA Storage Driver.

## 5. Troubleshooting

After installing the Intel® Chipset Software Installation Utility for Intel chipsets, certain symptoms may be seen depending on the system configuration. The following sections detail each of these symptoms as well as possible causes and resolutions.

### 5.1 Symptom: System Locks Up During Restart

*Resolution:* System lockup can occur during Restart as a result of several possible system issues. In the event of a system lockup, restart the machine and view Device Manager. If the devices listed under Hard Disk Controllers are listed properly and the system experiences no further problems, then the .INF file restore process was successful. If the devices are not configured correctly, try rerunning the Intel Chipset Software Installation Utility Setup program again.

### 5.2 Symptom: After Reboot, Windows\* Cannot Find ESDI\_506.PDR File

After running the Intel Chipset Software Installation Utility setup program and rebooting the system, Windows\* reports that it cannot find the ESDI\_506.pdr file.

*Resolution:* Click the 'Browse' button in the dialog box where this error occurs and locate the X:\Windows\System\IOSubsys directory and click on the 'OK' button. (X:\ is the hard drive letter where Windows is installed. ie. C:\) The system should be able to locate this file in this directory and continue re-enumerating for the new devices.

### 5.3 Symptom: After Reboot, Windows Cannot Find UHCD.SYS, USBD.SYS, and/or USBHUB.SYS Files

After running the Intel Chipset Software Installation Utility setup program and rebooting the system, Windows reports that it cannot find one of the following files:

UHCD.SYS  
USB.D.SYS  
USBHUB.SYS

*Resolution:* Click the 'Browse' button in the dialog box where this error occurs and locate the X:\Windows\System32\drivers directory and click on the 'OK' button. (X:\ is the hard drive letter where Windows is installed. ie. C:\) The system should be able to locate this file in this directory and continue re-enumerating for the new devices.

### 5.4 Symptom: After Reboot, Windows Cannot Find ISAPNP.VXD File

After running the Intel Chipset Software Installation Utility setup program and rebooting the system, Windows\* reports that it cannot find the isapnp.vxd file.

*Resolution:* Click the 'Browse' button in the dialog box where this error occurs and locate the X:\Windows\System directory and click on the 'OK' button. (X:\ is the hard drive letter where Windows is installed. ie. C:\) The system should be able to locate this file in this directory and continue re-enumerating for the new devices.

## 6. Intel® Ultra ATA Storage Driver

### 6.1 Description

The Intel® Ultra ATA Storage Driver enables fast Ultra ATA transfers for a variety of ATA/ATAPI storage devices such as hard drives and CD-ROMs. When configured properly with other elements of your system, the driver has been architected to take advantage of the latest Intel Ultra ATA controller features to improve both storage subsystem performance and overall system performance. Driver installation is fully automated for Microsoft\* Windows\* 98, Windows 98 Second Edition (SE), Windows Millennium Edition (Me), Windows 2000, and Windows NT\* 4.0 (with any Service Pack). Also included is the Intel® Ultra ATA Companion, a useful diagnostic tool that can be used to view technical details of the ATA subsystem.

### 6.2 Do You Need the Intel® Ultra ATA Storage Driver?

The Intel® Ultra ATA Storage Driver is designed to take advantage of devices supporting ATA DMA/Ultra DMA technologies and improve system performance. It is not a requirement for your operating system to work properly. The Intel Ultra ATA Storage Driver was created for users with a specific system configuration:

- System based on the Intel® 810, Intel® 810E, Intel® 810E2, Intel® 815, Intel® 815E, Intel® 815EP, Intel® 815P, Intel® 820, Intel® 820E, Intel® 840, Intel® 850, or Intel® 860 chipsets
- Using Windows\* 98, Windows 98 Second Edition (SE), Windows Millennium Edition (Me), Windows 2000, or Windows NT\* 4.0 (any Service Pack)

### 7.0 Option for Users with Windows\* 95 and/or Intel® 440xx/430xx Chipset

If you have retail Windows\* 95 (4.00.950), Windows 95 Service Release 1 (4.00.950a), and/or one of the following Intel® chipsets: 440BX/LX/EX/GX/FX 430FX/VX/HX/TX, you can obtain the Intel® Bus Master IDE driver. The Intel Bus Master IDE driver supports a maximum transfer mode of Ultra ATA/33 and it does not have a Companion diagnostic tool. The Intel Bus Master IDE driver is available at the following Intel web site:

<http://developer.intel.com/design/chipsets/drivers/busmastr/>

Troubleshooting information on the Intel Bus Master IDE driver can be found at the following Intel web site:

[http://developer.intel.com/support/chipsets/inf\\_bm.htm](http://developer.intel.com/support/chipsets/inf_bm.htm)

There is a troubleshooting document available at the above web site that also covers how to enable Bus Mastering using the native Microsoft drivers for users with Windows 95 OSR 2.0 or later (4.00.950b or 4.00.950c) and Windows 98.

## 8. Using the Intel® Ultra ATA Storage Driver

This section applies only to users with Windows\* 98 (4.10.1998), Windows 98 Second Edition (4.10.2222), Windows Millennium Edition (Me), Windows 2000, or Windows NT\* 4.0

### 8.1 System Requirements

To use the Intel® Ultra ATA Storage Driver, your system must meet ALL of the following requirements:

- An Intel® 810, Intel® 810E, Intel® 810E2, Intel® 815, Intel® 815E, Intel® 815EP, Intel® 815P, Intel® 820, Intel® 820E, Intel® 840, Intel® 850, or Intel® 860 chipset
- Windows 98, Windows 98 Second Edition (SE), Windows Millennium Edition (Me), Windows 2000, or Windows NT 4.0 (any Service Pack)

To take advantage of increased storage subsystem performance and overall system performance, your system must meet the following requirement:

- A bus mastering capable IDE/ATA or ATAPI device (ie. hard drive, CD-ROM) that supports DMA transfers

**Note:** Ultra ATA/66 and Ultra ATA/100 has specific requirements. Please refer to the section titled "Ultra ATA/66 and Ultra ATA/100" for more information.

### 8.2 Steps to take before installing the Intel Ultra ATA Storage Driver

### 8.3 Resolve Conflicts in Device Manager

Before installing the Intel Ultra ATA Storage Driver, there should be NO conflicts (ie. yellow exclamation points) in Device Manager under Hard Disk Controllers. Device Manager can be accessed by going to: Start Button / Settings / Control Panel / System / Device Manager. The Hard Disk Controller listing should show the following:



**Intel® 810 and Intel® 810E Chipsets**



**Intel® 820 Chipset**

If this does not match your configuration, use the Intel® Chipset Software Installation Utility. Please refer to the section titled "Intel® Chipset Software Installation Utility for Intel Chipsets" for more information.

## 8.4 Obtaining and Installing the Intel® Ultra ATA Storage Driver

The Intel® Ultra ATA Storage Driver for the Intel 800 series chipset family can be downloaded from the following Intel web site:

<http://support.intel.com/support/chipsets/storagedrivers/ultraATA/>

The Intel Ultra ATA Storage Driver is available for Windows\* 98, Windows 98 Second Edition (SE), Windows Millennium Edition (Me), Windows 2000, and Windows NT\* 4.0 in both English (intelata\_enu.exe) and multi-language (intelata\_multi.exe) versions. The file is self-extracting, self-installing so all you need to do is save the file to a known location on your hard drive. An included README.TXT file covers topics such as system requirements, basic installation instructions, and advanced installation instructions.

A Release Notes document is located at the following web site:

[http://apps.cps.intel.com/scripts-df/Product\\_Filter.asp?ProductID=182](http://apps.cps.intel.com/scripts-df/Product_Filter.asp?ProductID=182)

The Release Notes document covers topics such as limitations, known problems, and compatibility issues along with topics for more advanced users such as installer setup flags and unattended installation (please refer to next section) under Windows NT 4.0. The installer setup flags provide more advanced users with options such as silent installation and Program Folder definition.

After the Intel Ultra ATA Storage Driver has been downloaded from the Intel web site to a known location on your hard drive, you need to run the file intelata\_enu.exe (English version) or intelata\_multi.exe (multi-language). Running the file can be done by double-clicking on the file name. The installation program should launch after you double-click on the file name. Click on the "Next" button at the Welcome screen. Read the license agreement and click on the "Yes" button to continue. Click on the "Next" button to install the driver in the default folder location. Click on the "Next" button to create the default Program Folder. The driver files will now be installed. When finished installing, select the "Yes" button for the reboot option and click on the "Finish" button to restart your computer. The Intel Ultra ATA Storage Driver should now be loaded.

## 8.5 Unattended Installation Under Windows NT\* 4.0

To load the Intel Ultra ATA Storage Driver via the method outlined in the Microsoft\* document "Deployment Guide Automating Windows NT Setup," use the supplied TXTSETUP.OEM file included in our driver package and insert the lines below into the UNATTEND.TXT file. (The TXTSETUP.OEM, INTELATA.INF, and INTELATA.SYS file need to first be extracted from the compressed .CAB file. To extract these files, run 'SETUP -A -P <path>' as described in the "Installer Setup Flags" section of the Release Notes.)

// Insert the lines below into the UNATTEND.TXT file

```
[MassStorageDrivers]
```

```
"Intel Ultra ATA Controller" = OEM
```

```
[OEMBootFiles]
```

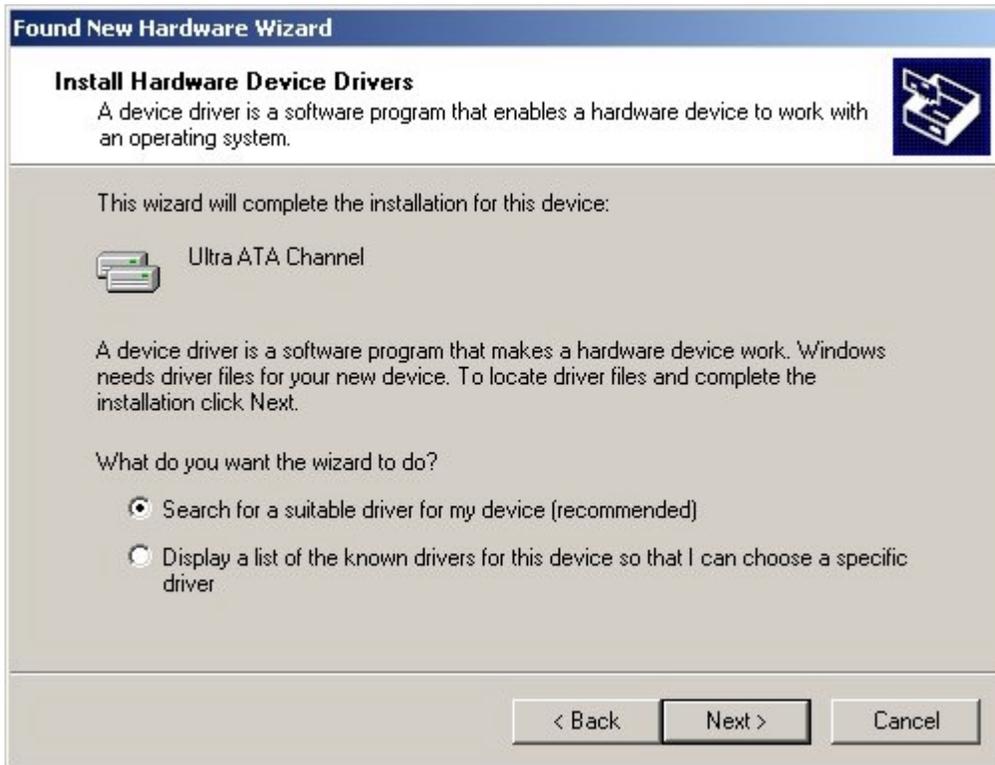
```
INTELATA.INF
```

```
INTELATA.SYS
```

```
TXTSETUP.OEM
```

## 8.6 Installation Under Windows\* 2000

After installing the Intel Ultra ATA Storage Driver on Windows 2000, new hardware will be detected by Windows 2000 and you will be prompted to install a device driver for an "Ultra ATA Channel." After the initial "Found New Hardware Wizard" screen, the following dialog box will appear:



Once this dialog box appears, leave the default radio button selection ('Search for a suitable driver for my device'), click on the 'Next' button and complete the following steps:

- On the 'Locate Driver Files' dialog box, leave the default search locations and click on the 'Next' button to continue
- After the wizard searches for the driver files, Windows should automatically find a driver in the following location:  
c:\winnt\inf\intelata.inf  
Once the driver has been found in this location, click on the 'Next' button
- You might be prompted with a 'Digital Signature Not Found' dialog box asking if you want to continue the installation. If this dialog box appears, click on the 'Yes' button to continue.
- A dialog box will then appear stating that Windows has finished installing the software for the device. Click on the 'Finish' button and you will be prompted to restart your computer. Click on the 'Yes' button to restart your computer.

**Note:** After you have restarted your computer, you will be prompted that another Ultra ATA Channel has been found. Simply follow the above steps again and restart your computer one final time for the changes to take effect.

## 8.7 Issues During Installation

### 8.7.1 Symptom: Incompatible Hardware

The following error message occurs during installation:



*Resolution:* This issue is resolved by installing the Intel® Ultra ATA Storage Driver on a system with one of the following Intel chipsets:

- Intel® 810, Intel® 810E, or Intel® 810E2 chipset
- Intel® 815, Intel® 815E, Intel® 815EP, or Intel® 815P chipset
- Intel® 820 or Intel® 820E chipset
- Intel® 840 chipset
- Intel® 850 chipset
- Intel® 860 chipset

### 8.7.2 Symptom: Operating System Not Supported

The following error message occurs during installation:



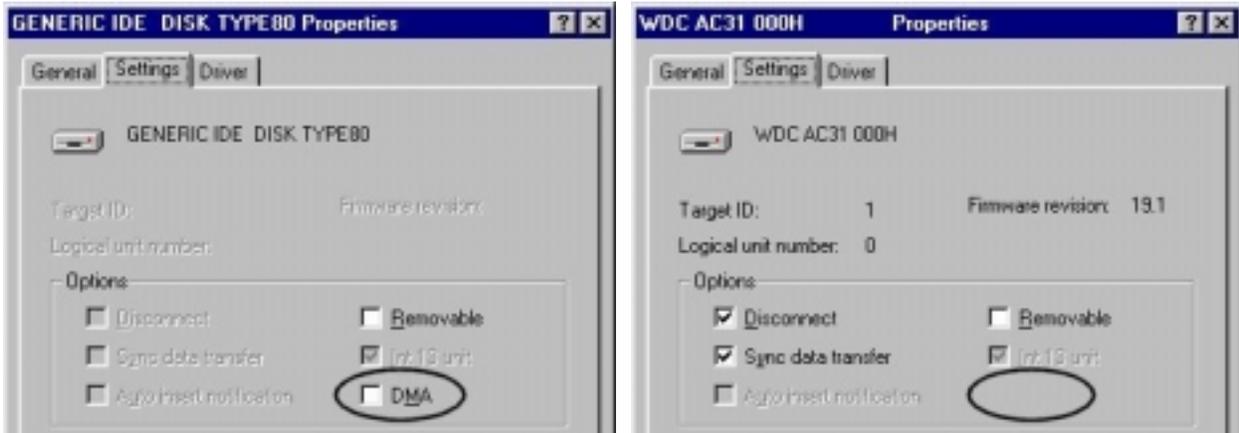
*Resolution:* This issue is resolved by installing the driver on a system with one of the following operating systems:

- Windows\* 98
- Windows 98 Second Edition (SE)
- Windows Millennium Edition (Me)
- Windows 2000
- Windows NT\* 4.0 (any Service Pack)

**Note For Windows NT 4.0 & Windows 2000 Users:** In order to successfully complete installation of the Intel Ultra ATA Storage Driver with Windows NT 4.0 and Windows 2000, the user must be logged on with Administration Rights.

## 8.8 DMA Checkbox Setting Not Available in Windows\* 98

After installing the Intel® Ultra ATA Storage Driver, the DMA checkbox setting will no longer be available in Windows\* 98 and Windows 98 Second Edition (SE). The DMA checkbox setting is usually located under: Start Button / Settings / Control Panel / System / Device Manager. Expand the listing under Disk Drives and double-click on Generic IDE Disk Type XX. After double-clicking the Generic IDE Disk Type, click on the 'Settings' tab. A DMA checkbox is normally present under the 'Options' section. Please see the following two illustrations:



Before Installation of Intel Ultra ATA Storage Driver

After Installation of Intel Ultra ATA Storage Driver

If you uninstall the Intel Ultra ATA Storage Driver, the previous DMA checkbox setting in Windows 98 and Windows 98 Second Edition (SE) for either ATA channel does not restore. This is a known issue with version 5.0 of the Intel Ultra ATA Storage Driver.

This known issue is included in Section 8 of the Release Notes document that is located at the following web site:

[http://appsrv.cps.intel.com/scripts-df/Product\\_Filter.asp?ProductID=182](http://appsrv.cps.intel.com/scripts-df/Product_Filter.asp?ProductID=182)

## 8.9 Confirming the Intel Ultra ATA Storage Driver for Windows\* 98 is Installed

To confirm that the Intel Ultra ATA Storage Driver for Windows\* 98 and Windows 98 Second Edition (SE) has been loaded, Device Manager / Hard Disk Controller listing should show the following:

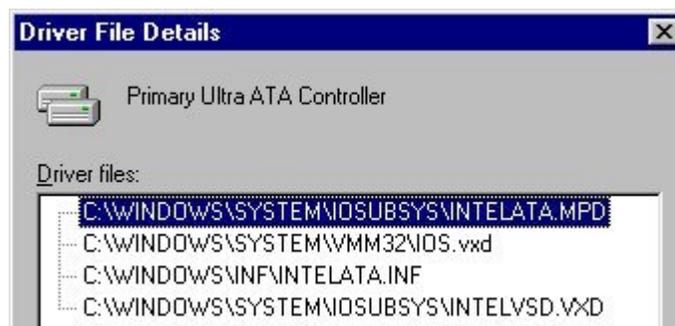


### Intel® 810, Intel® 810E, Intel® 815, and Intel® 820 Chipsets

**Note:** There is no "dual fifo" notation after either the Primary or Secondary IDE controller listing. If the "dual fifo" notation appears after installing the Intel Ultra ATA Storage Driver, the driver is not installed correctly.

Another way to confirm that the Intel Ultra ATA Storage Driver for Windows 98 and Windows 98 Second Edition (SE) has been loaded, complete the following steps:

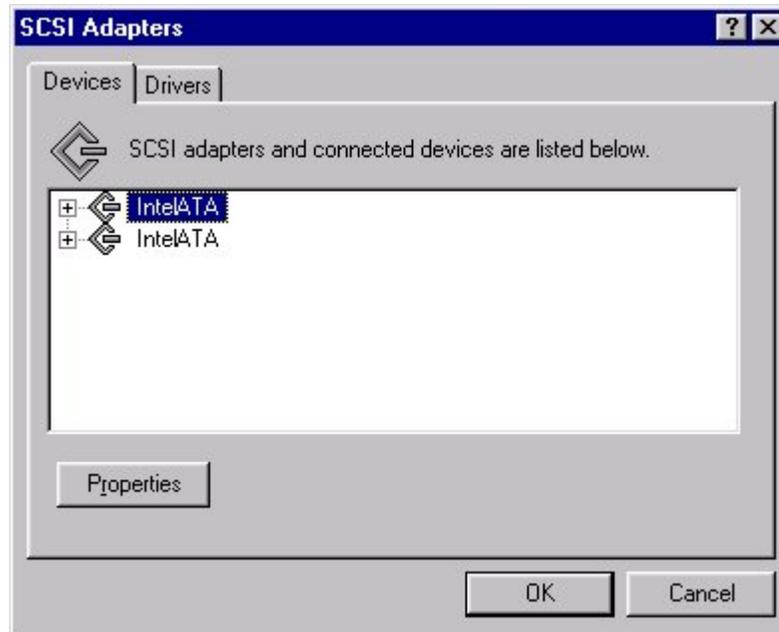
- Click on Start Button / Settings / Control Panel
- Double-click on the System icon
- Select the Device Manager tab and expand the listing for Hard disk controllers
- Select either the 'Primary' or 'Secondary' controller listed
- Select the Properties button
- Select the Driver tab
- Select the Driver File Details button
- 'IntelATA.MPD' should be displayed in the window as the following image illustrates:



## 8.10 Confirming Intel Ultra ATA Storage Driver for Windows NT\* 4.0 is Installed

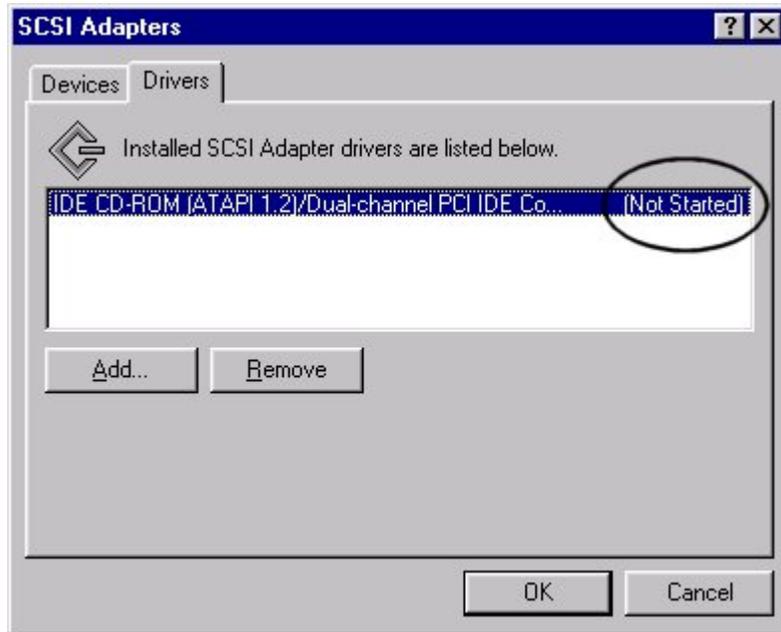
To confirm that the Intel Ultra ATA Storage Driver for Windows NT\* 4.0 has been loaded, complete the following steps:

- Click on Start Button / Settings / Control Panel
- Double-click on the SCSI Adapters icon
- 'IntelATA' or 'Intel Ultra ATA Controller' should be displayed in the window as the following image illustrates:



## 8.11 Windows NT 4.0 SCSI Adapters 'Drivers' Tab Indicates 'Not Started'

The 'Drivers' tab within the SCSI Adapters applet in Windows NT 4.0 will indicate that the driver is 'Not Started' as illustrated in the following image:



This is a known issue with version 5.0 of the Intel® Ultra ATA Storage Driver. The text should read "Intel Ultra ATA Controller [Started]". As long as the 'Devices' tab within the SCSI Adapters applet indicates 'IntelATA' or 'Intel Ultra ATA Controller,' the driver is installed correctly.

This known issue along with a workaround is included in Section 8 of the Release Notes document that is located at the following web site:

[http://appsr.cps.intel.com/scripts-df/Product\\_Filter.asp?ProductID=182](http://appsr.cps.intel.com/scripts-df/Product_Filter.asp?ProductID=182)

## 8.12 Uninstalling the Intel Ultra ATA Storage Driver

### 8.13 Windows\* 98 and Windows 98 Second Edition (SE)

To uninstall the Intel Ultra ATA Storage Driver from your system, complete the following steps:

- Click on Start Button / Settings / Control Panel
- Double-click on the Add/Remove Programs icon
- Under the Install/Uninstall tab, scroll down the list of software until you find 'Intel Ultra ATA Storage Driver'
- Highlight 'Intel Ultra ATA Storage Driver' by single-clicking on it one time
- Once it is highlighted, click on the 'Add/Remove' button
- You will be prompted with a dialog box confirming that you want to completely remove the Intel Ultra ATA Storage Driver and all of its components
- Click on the 'Yes' button and the unInstallShield will remove the Intel Ultra ATA Storage Driver from your computer
- Once the progress bar indicates completion, click on the 'OK' button
- You will be prompted with a dialog box recommending that you restart your machine to remove files that were in use during uninstall
- Click on the 'OK' button, close any open applications, and restart your system

### 8.14 Windows NT\* 4.0

If the Intel Ultra ATA Storage Driver was originally installed via specific advanced installer setup flags, uninstalling the driver might not be available. Please refer to Section 6 of the Release Notes document for more information on installer setup flags. The Release Notes document is located at the following web site:

[http://appsrv.cps.intel.com/scripts-df/Product\\_Filter.asp?ProductID=182](http://appsrv.cps.intel.com/scripts-df/Product_Filter.asp?ProductID=182)

## 9. Intel® Ultra ATA Companion

### 9.1 Description

The Intel® Ultra ATA Companion is a Win32 application which works in tandem with the Intel Ultra ATA Storage Driver to provide detailed, useful information about the storage subsystem. The Intel Ultra ATA Companion queries the Intel Ultra ATA Storage Driver to obtain detailed Ultra ATA Controller and device information, which is displayed on the screen and can be saved to a log file. The Intel Ultra ATA Companion can also be used to set a particular ATA or ATAPI device's transfer mode limit.

The Intel Ultra ATA Companion is installed via the Intel Ultra ATA Storage Driver Setup program. For more information on running the setup program, please refer to the section titled "Obtaining and Installing the Intel® Ultra ATA Storage Driver."

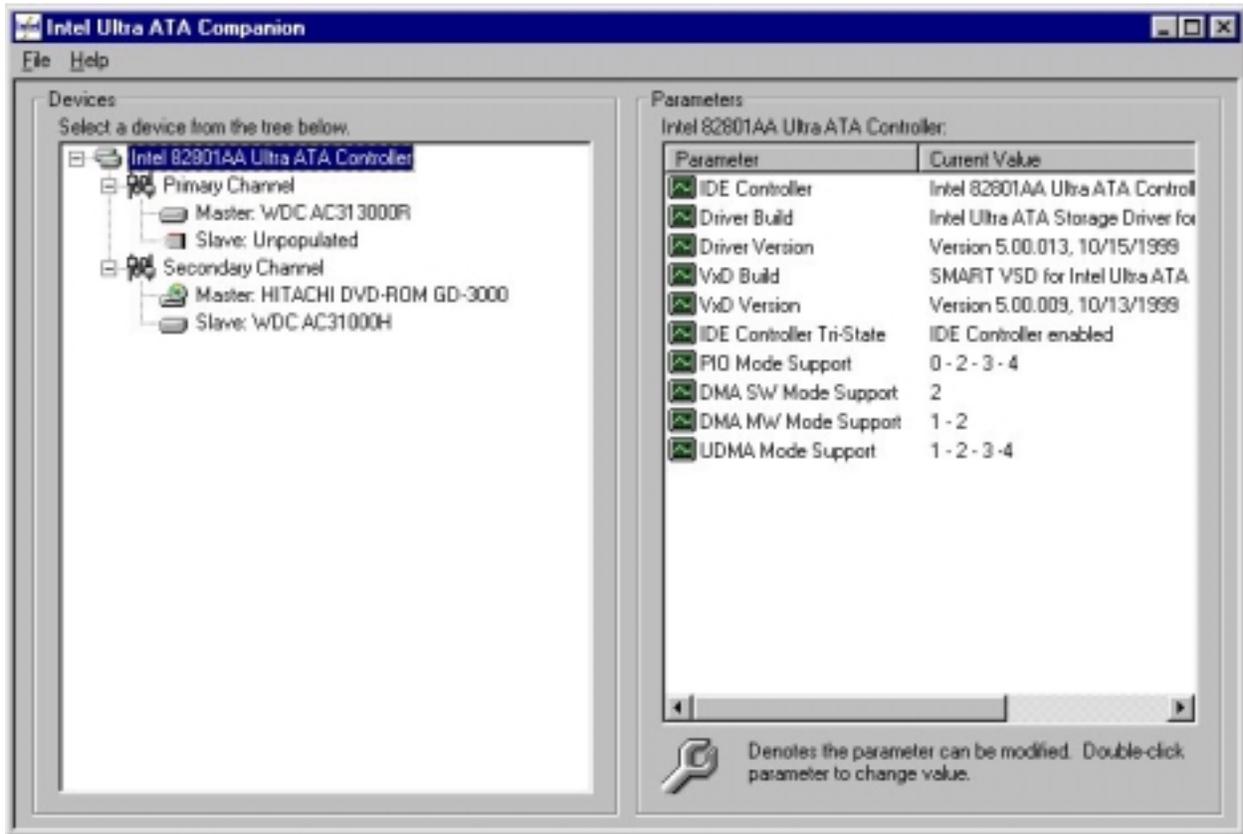
### 9.2 Using the Intel® Ultra ATA Companion

After the Intel Ultra ATA Storage Driver has been successfully installed and the system has rebooted, the following program group will appear:



After clicking on Companion, the following window will appear:

**Note:** The 'Devices' and 'Parameters' listing in your system can differ from the following illustration.

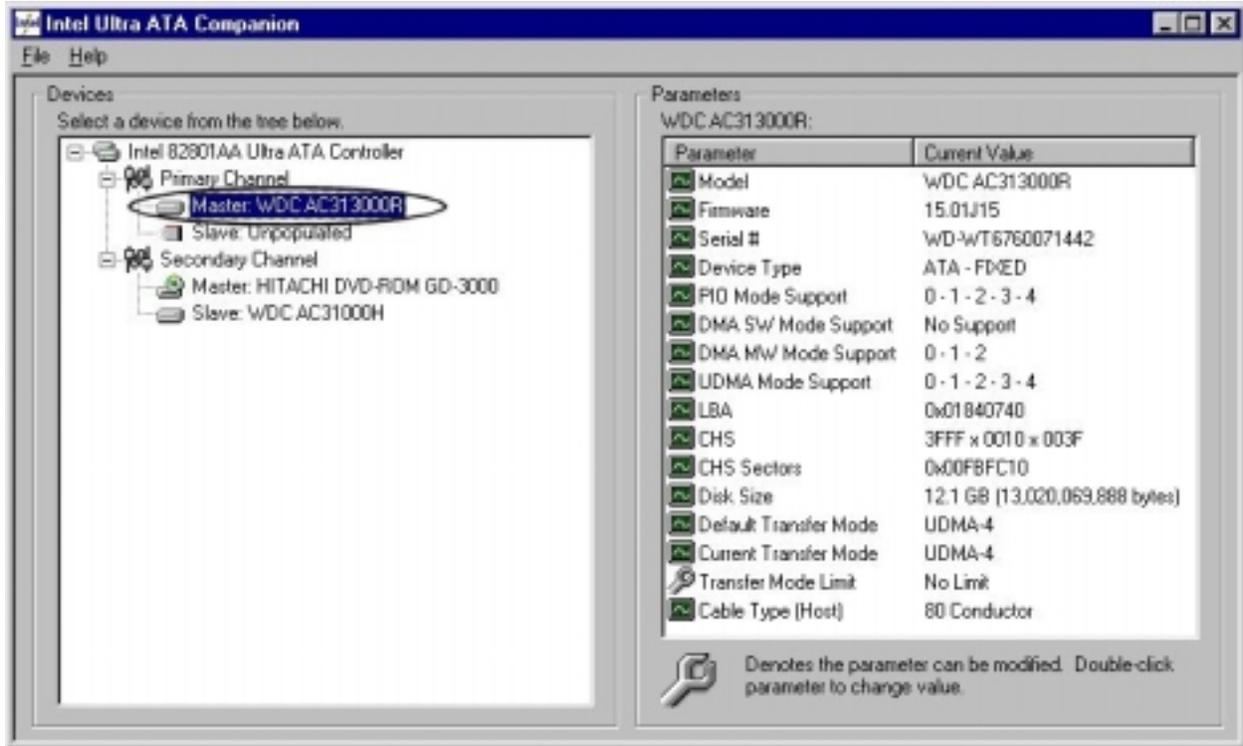


**Note:** For a complete list of descriptions for the names that appear under the Controller Parameters and Device Parameters, please refer to the Help file. The Help file is accessed by clicking on 'Help' and then 'Contents and Index.'

### 9.3 Primary Channel Master Device

After clicking on the 'Primary Channel' Master device, the 'Parameters' window will reflect information about the Primary Master device that is currently installed in your system. The following illustration is an example:

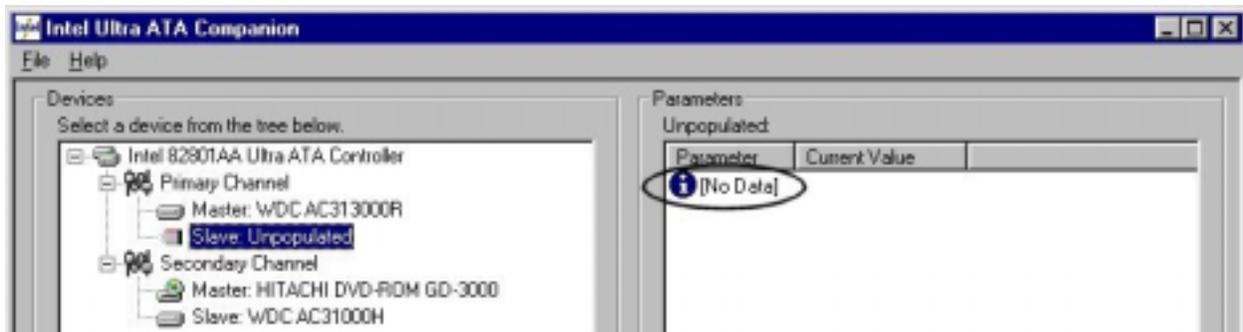
**Note:** The 'Devices' and 'Parameters' listing in your system can differ from the following example.



Information in the 'Parameters' window will reflect the model of the device that is currently installed as the Master device on the Primary Channel, along with the Default Transfer Mode, the Current Transfer Mode, and the type of cable installed on the device. (Please refer to the Section titled "40 Pin, 80-Conductor IDE Cable" for more information about cable types.)

### 9.4 Unpopulated Master/Slave on Primary or Secondary Channel

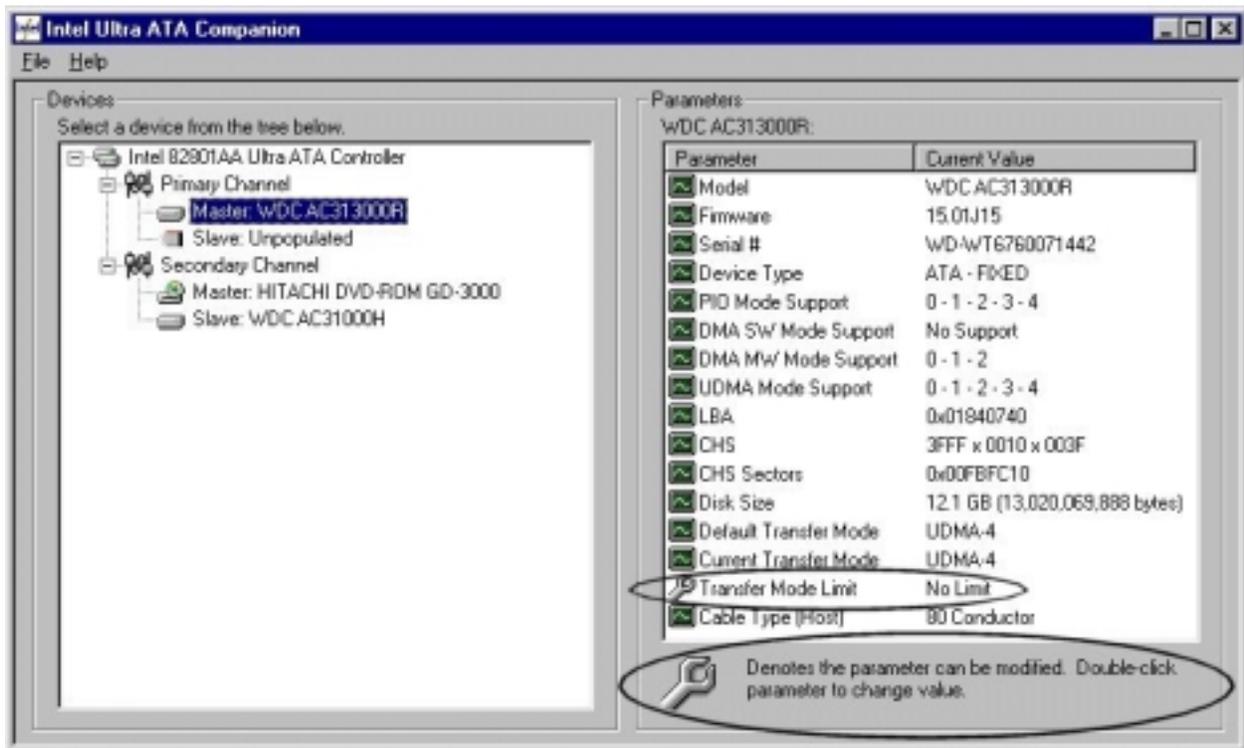
If no IDE or ATAPI device (ie. hard drive or CD-ROM) is installed as a Master or Slave on either the Primary or Secondary Channel, 'No Data' will appear under the 'Parameters' window as illustrated in the following example:



## 9.5 Changing Transfer Mode Limit Parameters

The Intel® Ultra ATA Companion allows you to modify the Transfer Mode Limit for each IDE and ATAPI device installed in your system. The wrench icon denotes the parameter that can be modified. Simply double-click on the parameter to change the value. The following illustration shows a parameter that can be modified:

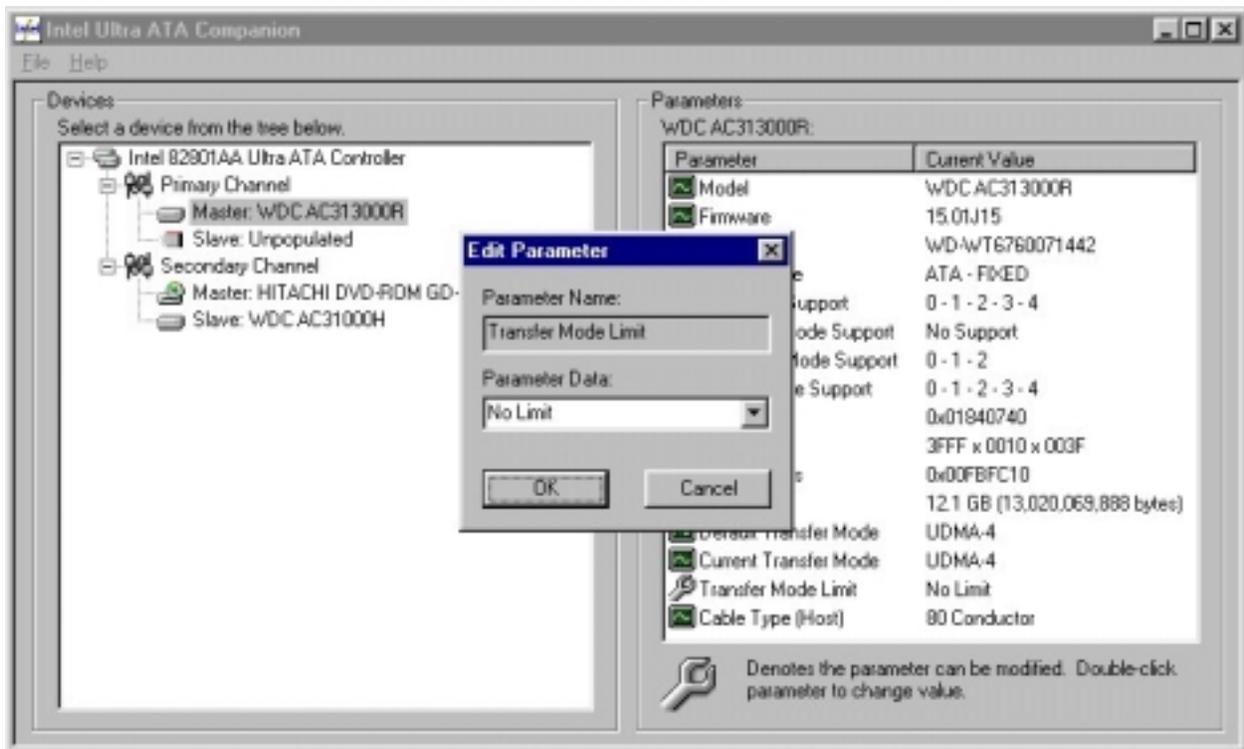
**Note:** The Intel Ultra ATA Storage Driver automatically configures all the IDE and ATAPI devices in your system for the maximum transfer mode possible even if the BIOS settings are incorrect. Changing the Transfer Mode for each device does not need to be done unless you have a specific need to decrease the Transfer Mode for specific devices to something less than the maximum. Leaving the Transfer Mode default settings will provide you with the optimal transfer rates available for your system.



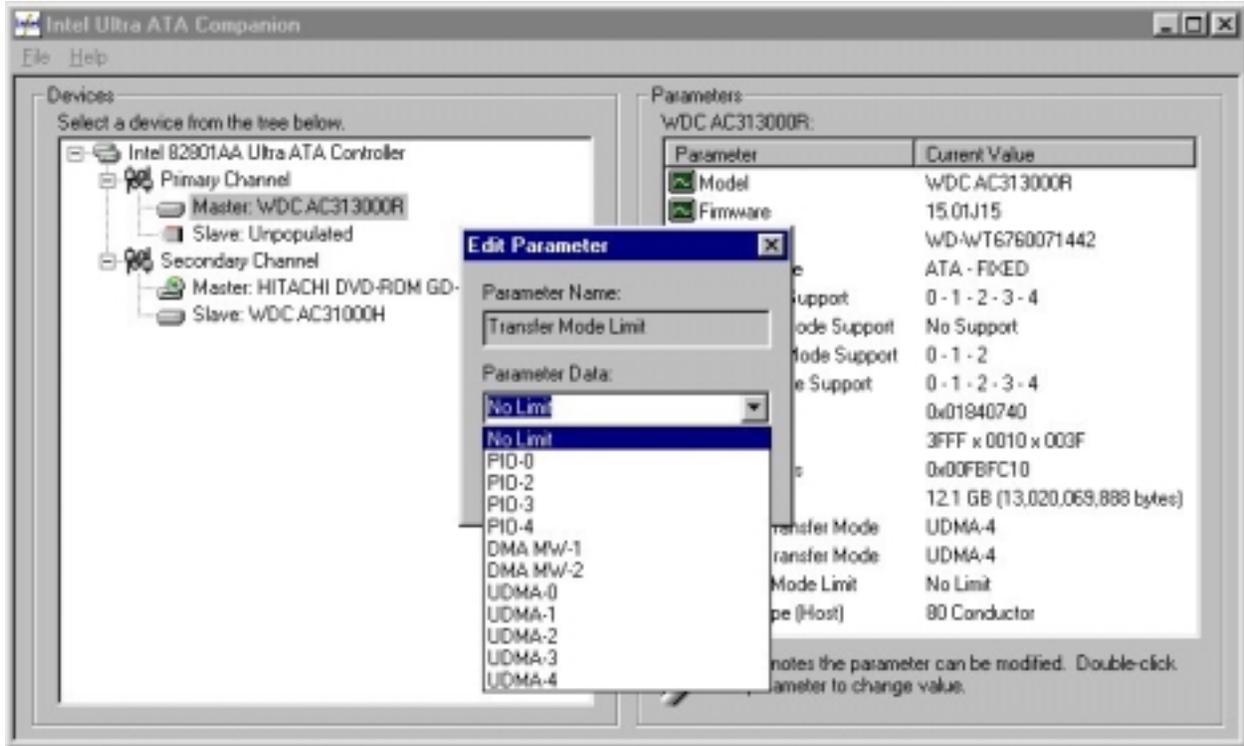
## 9.6 Independent Configuration of Different Devices on the Same Cable

The Intel Ultra ATA Driver allows different IDE or ATAPI devices that have different maximum transfer rates to be independently configured even when both devices are located on the same IDE cable. For example, if you have an IDE hard drive that is capable of Ultra ATA/66 transfers set up as the Master device on the Primary Channel and you have an ATAPI CD-ROM that is only capable of UDMA-2 (Ultra ATA/33) set up as the Slave device on the Primary Channel, each device can be independently configured. In the past, the slowest device installed on an IDE cable determined the rate at which both devices could transfer data. In the above example, this would mean that the rate for both devices would have been set at UDMA-2 because it is the slowest device. This was done to ensure that a device using an older technology was not damaged by using a transfer protocol that it was incapable of using. The Intel Ultra ATA Driver allows each device installed on the same IDE cable to be independent of the other device.

Double-clicking on the parameter with the wrench icon will cause the following dialog box to appear:



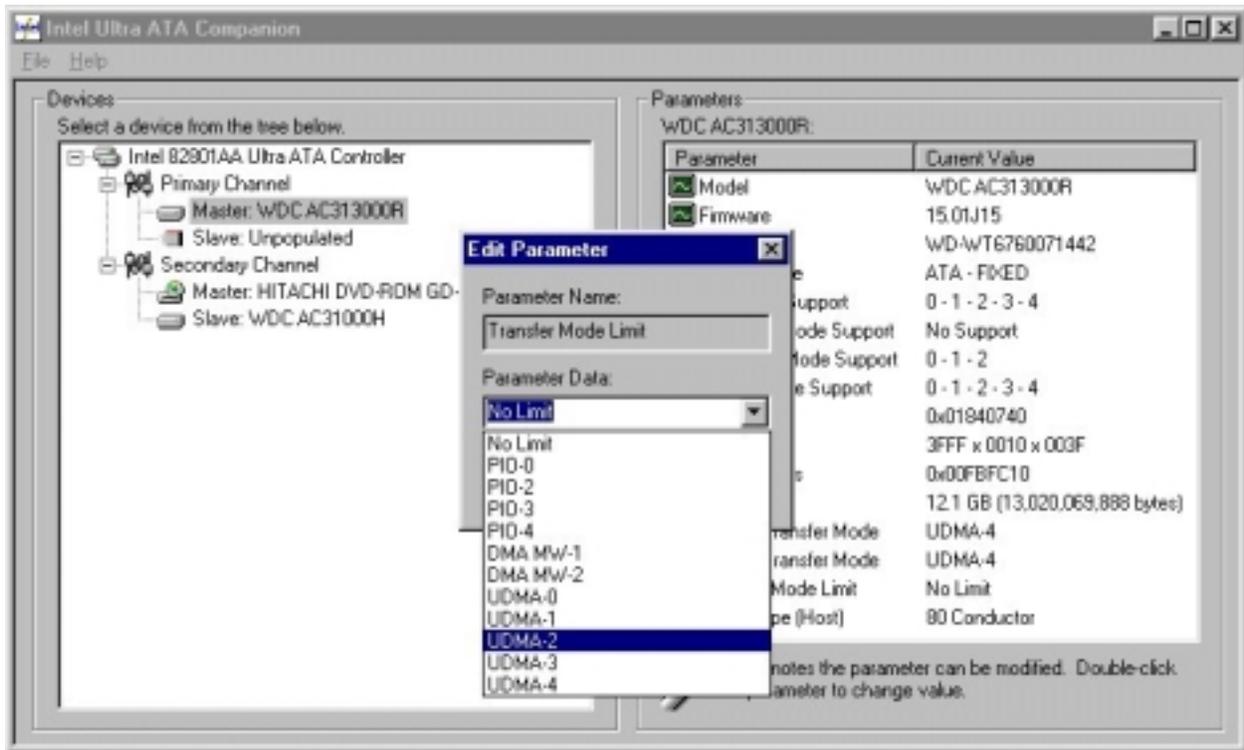
Click on the drop-down arrow located next to 'Parameter Data' to be given a choice of transfer modes that you can select from for this specific device. The above illustration has the Master device on the Primary Channel selected so any changes in this example would change the transfer mode for only the Master device on the Primary Channel. Each device would need to have the transfer mode configured separately. The following illustration shows an example of the Transfer Mode available for this specific IDE device:



Arrow down the list and select the transfer mode you are interested in. Please refer to the section titled "Theoretical Transfer Rates Associated with Transfer Modes" for transfer rates associated with each transfer mode.

**Note:** The Intel Ultra ATA Companion will not allow you to select a transfer mode that is not supported by your device or the IDE controller. If a transfer mode appears in the drop-down list, the device that you have selected should support any of the modes that appear in the drop-down list.

The following illustration shows an example of changing the Master device on the Primary Channel from the default setting of a UDMA-4 transfer mode to a UDMA-2 transfer mode:



## 9.7 Theoretical Transfer Rates Associated with Transfer Modes

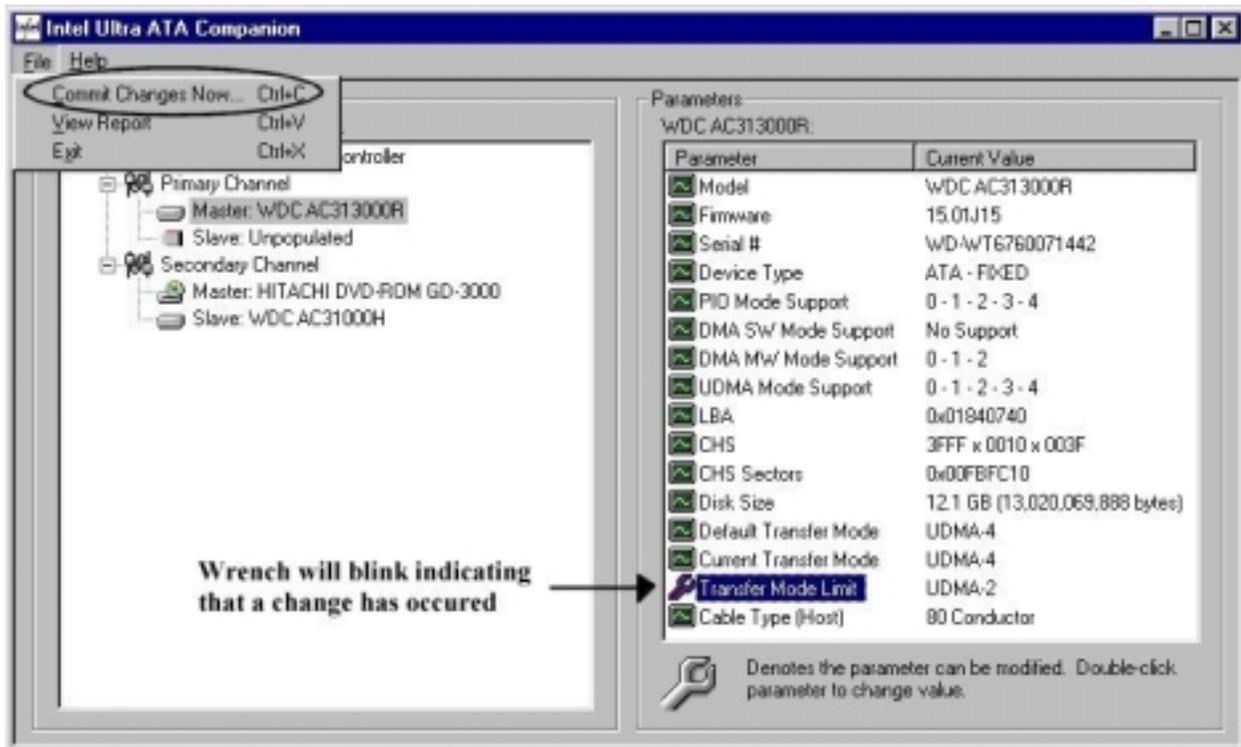
The table below lists different transfer modes that certain IDE and ATAPI (ie. hard drive, CD-ROM) devices support along with the theoretical transfer rate. Please refer to the documentation that was bundled with your device or contact the hardware manufacturer for more information about your specific IDE or ATAPI device.

**Note:** This table contains theoretical transfer rates of ATA transfer modes supported by the 82801AA and/or 82801AB ICH controller. Your actual transfer rates can vary from the information contained in this table. In order to take advantage of UDMA-4 (Ultra ATA/66) or UDMA-5 (Ultra ATA/100), your system must meet specific requirements. Please refer to the section titled "Ultra ATA/66 and Ultra ATA/100" for more information.

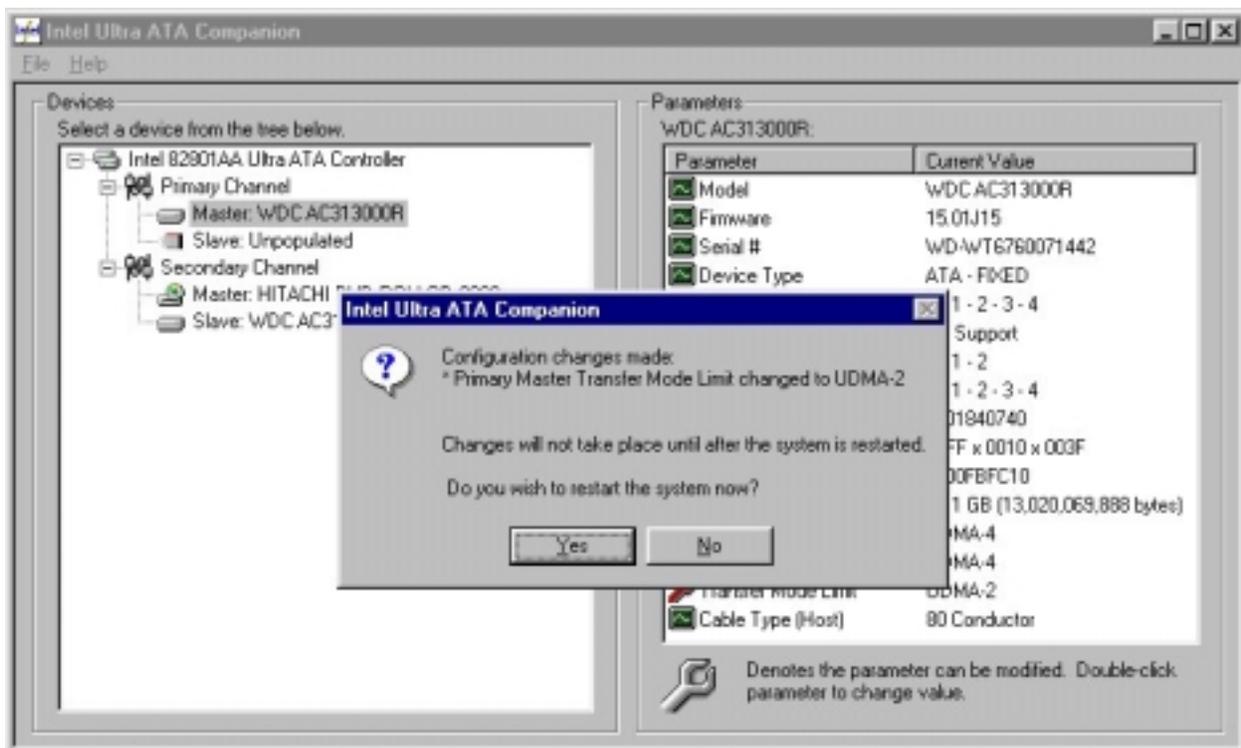
### TRANSFER RATES ASSOCIATED WITH TRANSFER MODES

Mode	Theoretical Transfer Rate (MB/s)
PIO-0	3.3
PIO-1	5.2
PIO-2	8.3
PIO-3	11.1
PIO-4	16.6
DMA Multi-Word-1	13.3
DMA Multi-Word-2	16.6
Ultra DMA-0	16.6
Ultra DMA-1	25
Ultra DMA-2	33.3
Ultra DMA-3	44.4
Ultra DMA-4	66.6
Ultra DMA-5	100

After a transfer mode has been selected, the wrench icon will blink indicating that a change has occurred. Once you are satisfied with the selected transfer mode for each device in your system, arrow up and click on 'File' (located at the top left of the Companion window), arrow down and click on 'Commit Changes Now' as illustrated in the following example:



Once you have clicked on 'Commit Changes Now,' you will be prompted with the following dialog box:

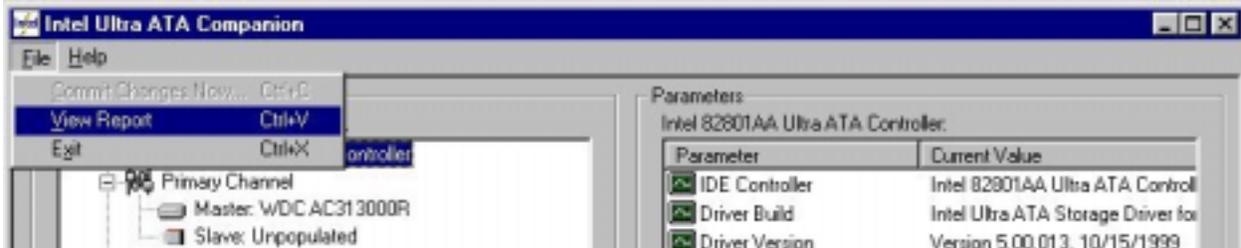


You must restart your system for any changes to take place.

## 9.8 Generate and View a Report using the Intel Ultra ATA Companion

The Intel Ultra ATA Companion allows you to generate and view a report. Everything that appears for each device in your system (except for the Serial #'s), can be generated into a report. This information can be very helpful if you need assistance from Intel Customer Support.

To generate and view a report, simply arrow up and click on 'File' (located at the top left of the Companion window), arrow down and click on 'View Report' as illustrated in the following example:

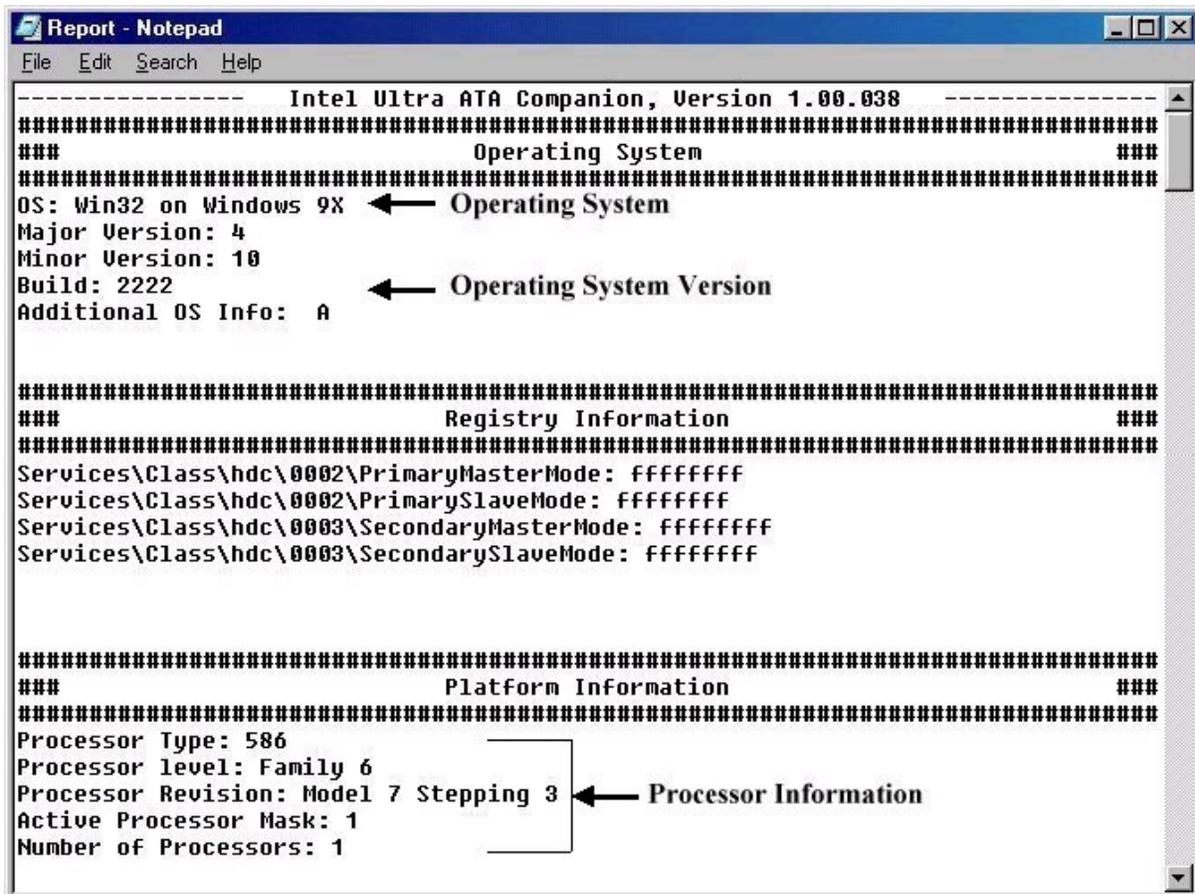


The report will be generated and opened in your default text viewer such as Notepad\* or WordPad.\* The file can then be saved to a location on your hard drive.

## 9.9 Example of Generated Report Using the Intel Ultra ATA Companion

The following is an example of a generated report using the Intel Ultra ATA Companion:

**Note:** A generated report from your system can differ from the following example.



```

Report - Notepad
File Edit Search Help

#####
###                               Driver Information                               ###
#####
HPD Info:
Version 5.00.013, 10/15/1999 ← Intel® Ultra ATA Storage Driver Version
Intel Ultra ATA Storage Driver for Windows 98*

UxD Info:
Version 5.00.009, 10/13/1999
SMART USD for Intel Ultra ATA Storage Driver for Windows 98*

#####
###                               Controller Information                               ###
#####
IDE Controller: Intel 82801AA Ultra ATA Controller, ICH
Storage Driver Kit Build(s): 5.00.018
Driver Build: Intel Ultra ATA Storage Driver for Windows 98*
Driver Version: Version 5.00.013, 10/15/1999
UxD Build: SMART USD for Intel Ultra ATA Storage Driver for Windows 98*
UxD Version: Version 5.00.009, 10/13/1999
IDE Controller Tri-State: IDE Controller enabled
PIO Mode Support: 0 - 2 - 3 - 4
DMA SW Mode Support: 2
DMA HW Mode Support: 1 - 2
UDMA Mode Support: 1 - 2 - 3 -4 ← Transfer Modes Supported
UDMA on 80 conductor cable only: Disabled
Ping Pong Enable: Enabled

```

```

Report - Notepad
File Edit Search Help

#####
###                               Channel Information                               ###
#####

----- Primary Channel -----
No Data

----- Secondary Channel -----
No Data

#####
###                               Device Information                               ###
#####

----- Primary Master: WDC AC313000R -----
Model: WDC AC313000R
Firmware: 15.01J15
Device Type: ATA - FIXED
PIO Mode Support: 0 - 1 - 2 - 3 - 4
DMA SW Mode Support: No Support
DMA HW Mode Support: 0 - 1 - 2
UDMA Mode Support: 0 - 1 - 2 - 3 - 4 ← Information Specific to Master Device
LBA: 0x01840740
CHS: 3FFF x 0010 x 003F
CHS Sectors: 0x00FBFC10
Disk Size: 12.1 GB (13,020,069,888 bytes)
Default Transfer Mode: UDMA-4
Current Transfer Mode: UDMA-4
Transfer Mode Limit: No Limit
Cable Type (Device): 80 Conductor

```

```

Report - Notepad
File Edit Search Help
240 0000 0000 0000 0000 0000 0000 0000 0000
248 0000 0000 0000 0000 0000 0000 0000 7F00
----- Primary Slave: No Device Connected -----
----- Secondary Master: HITACHI DVD-ROM GD-3000 -----
Model: HITACHI DVD-ROM GD-3000
Firmware: 0020
Device Type: ATAPI - Removable - CDROM
PIO Mode Support: 0 - 1 - 2 - 3 - 4
DMA SW Mode Support: 0 - 1 - 2
DMA HW Mode Support: 0 - 1 - 2
UDMA Mode Support: No Support
Default Transfer Mode: DMA HW-2
Current Transfer Mode: DMA HW-2
Transfer Mode Limit: No Limit
Cable Type (Device): 40 Conductor
Cable Type (Host): 40 Conductor
PIO PPE: Enabled
UDMA Control Register: Ultra DMA Mode Disabled

Device Identify Data:
  0 1 2 3 4 5 6 7
  0 c085 0000 0000 0000 0000 0000 0000 0000
  8 0000 0000 2020 2020 2020 2020 2020 2020
 16 2020 2020 2020 2020 0000 0000 0000 3030
 24 3032 2020 2020 4948 4154 4843 2049 5644
 32 2d44 4f52 204d 4447 332d 3030 2030 2020
 40 2020 2020 2020 2020 2020 2020 2020 0000

```

Indicates No Slave Device is currently installed on Primary Channel

Information Specific to Master Device currently installed on Secondary Channel

```

Report - Notepad
File Edit Search Help
240 0000 0000 0000 0000 0000 0000 0000 0000
248 0000 0000 0000 0000 0000 0000 0000 0000
----- Secondary Slave: WDC AC31000H -----
Model: WDC AC31000H
Firmware: 19.19E22
Device Type: ATA - FIXED
PIO Mode Support: 0 - 1 - 2 - 3
DMA SW Mode Support: 0
DMA HW Mode Support: 0 - 1
UDMA Mode Support: No Support
LBA: 0x00204CC0
CHS: 0034 x 0010 x 003F
CHS Sectors: 0x00204CC0
Disk Size: 1.0 GB (1,083,801,600 bytes)
Default Transfer Mode: PIO-3
Current Transfer Mode: PIO-3
Transfer Mode Limit: No Limit
Cable Type (Device): 40 Conductor
Cable Type (Host): 40 Conductor
PIO PPE: Disabled
UDMA Control Register: Ultra DMA Mode Disabled

Device Identify Data:
  0 1 2 3 4 5 6 7
  0 7a42 3480 0000 1000 00e1 5820 3f00 1000
  8 0000 e000 4457 572d 3254 3237 3531 3732
 16 3730 2036 2020 2020 3000 0010 4000 3931
 24 312e 4539 3232 4457 2043 4341 3133 3030

```

Information Specific to Slave Device currently installed on Secondary Channel

## 10. Ultra ATA/66 and Ultra ATA/100

### 10.1 Description

Ultra ATA/66 is a newer transfer protocol technology with a theoretical transfer rate of 66 MB/s. Ultra ATA/66 is also referred to as Ultra DMA/66, Fast ATA-2, and UDMA-4 by some hard drive manufacturers. Ultra ATA/100 is the newest transfer protocol technology with a theoretical transfer rate of 100 MB/s. Ultra ATA/100 is also referred to as Ultra DMA/100 and UDMA-5. Ultra ATA/66 and Ultra ATA/100 is backwards compatible with earlier Ultra ATA/33 and DMA technology, and with existing EIDE/IDE hard drives and CD-ROM drives. Please contact your computer manufacturer or place of purchase to determine if your system supports Ultra ATA/66 or Ultra ATA/100.

### 10.2 System Requirements

To use Ultra ATA/66 or Ultra ATA/100, your system must meet ALL of the following requirements:

- Ultra ATA/66 or Ultra ATA/100 compatible logic either on the motherboard, or on an Ultra DMA PCI adapter card
- Ultra DMA compatible BIOS
- DMA-aware device driver for the operating system
- Ultra ATA/66 or Ultra ATA/100-compatible IDE or ATAPI device such as a hard drive or CD-ROM
- A 40 pin, 80-conductor IDE cable (previous IDE cables are 40 pin, 40-conductor)

**Note:** The Intel® 810E2, Intel® 815E, Intel® 815EM, Intel® 815EP, Intel® 820E, Intel® 850, and Intel® 860 chipsets are currently the only Intel chipsets that support Ultra ATA/100.

## 11. 40 Pin, 80-Conductor IDE Cable

### 11.1 Description

A 40 pin, 80-conductor IDE cable reduces noise and crosstalk and allows for higher transfer rates. Previous IDE cables are 40 pin, 40-conductor.

### 11.2 Do I need to have a 40 Pin, 80-conductor IDE Cable for Ultra ATA/66 and ATA/100?

In order to take advantage of Ultra ATA/66 and Ultra ATA/100 you need to have a 40 pin, 80-conductor IDE cable and a system BIOS that is capable of detecting a 40 pin, 80-conductor cable. Some motherboards require that you update the BIOS in order for them to properly detect this type of cable. If the BIOS cannot properly detect the type of IDE cable installed in your system, you will not be able to achieve Ultra ATA/66 or Ultra ATA/100 transfer rates. Please contact your motherboard manufacturer for more information.

**Note:** A 40 pin, 40-conductor IDE cable can be used but it will limit the device to Ultra ATA/33 transfer rates.

**Important Note for Removable / Mobile IDE Rack Users:** If you have an Ultra ATA/66 or Ultra ATA/100 IDE device that uses a removable/mobile IDE rack, verify that the short IDE cable inside the tray is 40 pin, 80-conductor. If the IDE cable inside the tray is 40 pin, 40-conductor, it will limit the device to Ultra ATA/33. Please contact the mobile IDE rack manufacturer for more information.

## 11.3 Troubleshooting

### 11.3.1 Symptom: Intel Ultra ATA Companion Incorrectly Recognizes IDE Cable

The Intel® Ultra ATA Companion incorrectly recognizes the cable type as 40 conductor even though an 80 conductor cable is installed resulting in slower performance of IDE/ATAPI drives.

*Possible Causes:* There are several things that could cause this symptom to occur.

The first step is verify that your system meets ALL the Ultra ATA/66 or Ultra ATA/100 requirements that are listed in the section titled "Ultra ATA/66 and Ultra ATA/100."

If the motherboard BIOS is not capable of detecting the type of IDE/ATA cable installed, the 40 pin, 80-conductor cable will be reported as being 40-conductor. Not all motherboards BIOS's are capable of detecting 40 pin, 80-conductor cables. Updating the motherboard BIOS can correct this issue on some motherboards. Please contact your motherboard manufacturer for more information.

If the motherboard chipset or IDE controller card is not capable of using Ultra ATA/66 or Ultra ATA/100 transfer modes, the cable can be incorrectly reported. Please contact your motherboard or IDE controller card manufacturer to determine if your hardware supports Ultra ATA/66 or Ultra ATA/100 transfer modes.

If an Ultra DMA-2 (Ultra ATA/33) device is slaved to a high performance DMA-capable device such as an Ultra ATA/66 hard drive, the cable type can be reported as being 40-conductor. The reason that this occurs is because of performance issues with the Ultra DMA-2 device being configured as a slave device.

*Resolution:* Try switching the master/slave devices to the opposite configuration of how they are currently configured. Another option is to move the slave device so that it is not mated with an Ultra ATA/66 master device.

If the all the system requirements for Ultra ATA/66 or Ultra ATA/100 has been verified and you are still experiencing problems with the cable being incorrectly recognized, you might have a defective 40 pin, 80-conductor IDE cable. If possible, try using another 40 pin, 80-conductor IDE cable and see if the problem still occurs. You can also try contacting the cable manufacturer to see if they have seen this issue before.

### 11.3.2 Symptom: Unable to Update BIOS to Correctly Detect Cable Type

If you are unable to update the BIOS in your system, an Ultra DMA PCI adapter card might be a possible workaround. Please contact your computer manufacturer or place of purchase to determine if your system can accept an Ultra DMA PCI adapter card.

### **11.3.3 Symptom: System Will Not Boot with 40 Pin, 80-Conductor IDE Cable Installed**

If your system does not boot with a 40 pin, 80-conductor IDE cable installed, verify that your system meets ALL the Ultra ATA/66 or Ultra ATA/100 requirements that are listed in the section titled "Ultra ATA/66 and Ultra ATA/100." Please refer to the previous symptom titled "Intel Ultra ATA Companion Incorrectly Recognizes IDE Cable" for possible causes. Another option is to try using a 40 pin, 40-conductor cable to see if the system will boot.

### **11.3.4 Symptom: System Performance is Slower Than Expected Using 1 Hard Drive and 1 CD-ROM**

Having one device (ie. hard drive) configured as the Master Device on the Primary IDE Controller and one device (ie. CD-ROM) configured as the Master Device on the Secondary IDE Controller will provide the best performance. The reason that this configuration provides the best performance is because of latency issues with two devices installed on the same IDE controller. Please refer to the following symptom titled "Difficulty Recognizing Master/Slave Devices Installed on 40 Pin, 80-Conductor IDE cable" to verify correct device placement and attachment.

### **11.3.5 Symptom: Difficulty Recognizing Master/Slave Devices Installed on 40 Pin, 80-Conductor IDE Cable**

If you are having difficulties recognizing Master/Slave devices that are installed on the same 40 pin, 80-conductor IDE cable, it could be due to incorrect cable attachment. The 40 pin, 80-conductor IDE cable requires that the Master Device is installed at the end of the cable and the Slave Device is installed on the middle connector. Most 40 pin, 80-conductor IDE cables are color-coded to insure correct device placement and attachment. Typical color-coding for 40 pin, 80-conductor IDE cables is: Blue indicates attachment to the IDE Controller (on motherboard or Ultra DMA PCI adapter card), Black indicates attachment to the Master Device, and Gray indicates the Slave Device. The jumper settings for each device must be correctly configured for this configuration. Please contact the device manufacturer for the correct jumper settings for your specific device.

### **11.3.6 Symptom: Registry Access Error Message in Windows\* 98 and Windows 98 Second Edition (SE)**

A Registry access error message occurs in Windows\* 98 and Windows 98 Second Edition (SE) after installing the Intel Ultra ATA Storage Driver and rebooting your system.

*Resolution:* Driver version 6.03 is available that should correct this issue. If you have driver version 5.0, 5.01, or 5.02 on your system, we recommend that you uninstall the driver and reinstall using driver version 6.03 or later. Driver version 6.03 and later can be obtained from the following Intel web site:

<http://support.intel.com/support/chipsets/storagedrivers/ultraATA/>

### **11.3.7 Symptom: Corrupted Files when Using Norton\* Speed Disk\***

Some customers have reported issues using the Intel Ultra ATA Storage Driver with Norton\* Speed Disk.\* The main issue reported has been corrupted files. We are investigating these reports. At this time, we recommend that you do not use Norton Speed Disk with the Intel Ultra ATA Storage Driver.

### **11.3.8 Symptom: 'Inaccessible Boot Device' in Windows\* 2000 when Using Adaptec\* Easy CD Creator\* Version 4.02c\_s10**

When installing the Intel® Ultra ATA Storage Driver after Easy CD Creator\* version 4.02c\_s10 on systems with Windows\* 2000 installed, the system will fail to complete installation of the Intel Ultra ATA Storage Driver resulting in a blue screen error. Following this condition, the system will not be bootable and will report an 'Inaccessible Boot Device' error at each subsequent reboot.

*Resolution:* This issue can be prevented by first upgrading to version 4.02e (or newer version) of Easy CD Creator before installing the Intel Ultra ATA Storage Driver. Version 4.02e of Easy CD Creator can be obtained from the following Roxio\* (now a subsidiary of Adaptec,\* Inc.) website: <http://www.roxio.com>

After extensive investigation with Roxio of the 'Inaccessible Boot Device' error message, we have found that the Intel Ultra ATA Storage Driver is not the root cause of these incompatibilities. However, Intel is continuing to work with Roxio to resolve this issue as soon as possible. Please visit Roxio's website for future updates and/or workarounds.

### **11.3.9 Symptom: CD Recording Device Not Recognized by Adaptec\* Easy CD Creator\***

If your CD recording device is not recognized by Adaptec\* Easy CD Creator,\* please update to the latest version by going to <http://www.roxio.com> for the latest CD-R/CD-RW device support. Roxio\* is now a subsidiary of Adaptec, Inc.

### **11.3.10 Symptom: 'Old or Out-of-Date Firmware' Error Message Appears in System Event Log**

Some customers have reported that an 'old or out-of-date firmware' message appears in the system event log when using Windows\* 2000 and Windows NT\* 4.0. Microsoft\* has posted a Knowledge Base article regarding this issue that is available on [Microsoft's website](#).

### **11.3.11 Symptom: High 'CPU utilization' Reported in HD Tach\* Utility**

Some customers have reported that version 2.61 of HD Tach\* (utility created by TCD Labs\*, Inc.) reports high 'CPU utilization' when the Intel® Ultra ATA Storage Driver is installed. After further investigation of HD Tach version 2.61, the producers of HD Tach indicated to Intel that the tool is targeted as a disk and driver tuning tool and not necessarily as a benchmark for grading the real-life 'CPU utilization' of a storage driver. Listed below is the technical explanation of why the 'CPU utilization' is reported as higher in HD Tach version 2.61 when the Intel Ultra ATA Storage Driver is installed:

The HD Tach utility (version 2.61) measures how much the processor is utilized during a timed disk Input/Output (I/O) transfer loop by comparing how many loops of an integer math routine are run when the I/O transfer is taking place versus how many of the same integer math loops are run in a similar timed run without the disk I/O operating. The HD Tach utility then generates a processor overhead percentage based on the difference of the two idle loop count runs. The HD Tach 'CPU utilization' results are a worst-case scenario based on continuous drive operation, which in real-world situations happens quite rarely. Even during the running of highly disk-intensive benchmarks, such as WinBench\* Disk WinMarks\*, the disk is only accessed around 30% during the timed test. As a result, the HD Tach utilization report truly is a worst-case scenario.

Note however that this is not indicative of the actual processor usage of the Intel Ultra ATA Storage Driver compared to typical operation where application and driver time are factored in. The 'CPU utilization' for Business Winstone\*, or other business application-based benchmarks, report a much lower 'CPU utilization' number. When 'CPU utilization' for the rest of the operating system and applications are factored in, the Intel Ultra ATA Storage Driver accounts for a much smaller increase in 'CPU utilization' than the HD Tach utility reports.

The Intel Ultra ATA Storage Driver does implement features in the driver that, while it may show higher 'CPU utilization' in utilities such as HD Tach, does enhance performance on the system by working more effectively with hard drives to reduce the overall latency and bandwidth required to do the required disk I/O.