Integrity™

**Test the stability of virtually all
re-writable storage devices and interfaces**

Available for MacOS™ X and Windows™ 2000 and later

User's Guide

intech

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1 Guide Introduction

About This Guide

The instructions and explanations in this guide assume that you understand how to operate your computer system. You should, for example, know how to choose, select, drag and launch/start an application by using your mouse. In addition, you should also understand how the desktop, windows, dialog boxes, buttons and file/folders work within the system environment. For more information about these items, please refer to your operating system's user guide and/or your computer's user guide.

Conventions Used In This Guide

Note: This symbol calls your attention to important information about the adjacent text. A note will always appear in standard print.

Warning: This symbol calls your attention to procedures in the adjacent text which could cause harm to you, your data or computer system. A warning will always appear in bold print.

User Registration

Please take a moment to register your copy of the SpeedTools™ software on-line via the Intech Software World Wide Web site at http://www.SpeedTools.com.

Technical Information

If you received this software with the purchase of a drive subsystem and you require technical support, Intech as made special arrangements with your drive manufacturer to support this software directly via their technical support department. For customers who have purchased this software product as stand-alone, Intech provides technical information and other late-breaking information via its web site at http://www.SpeedTools.com.

2 Describing the Integrity™ Utility

About Integrity

The Integrity utility is designed to detect problems associated with disk firmware, data cable signal quality and the overall data transferring reliability of various storage devices and the busses to which they are connected. Over the years, the Integrity utility has become an essential testing tool during Intech's development of various commercial driver and utility products. Now Intech has made Integrity available to everyone to help detect data transfer problems with permanent storage devices.
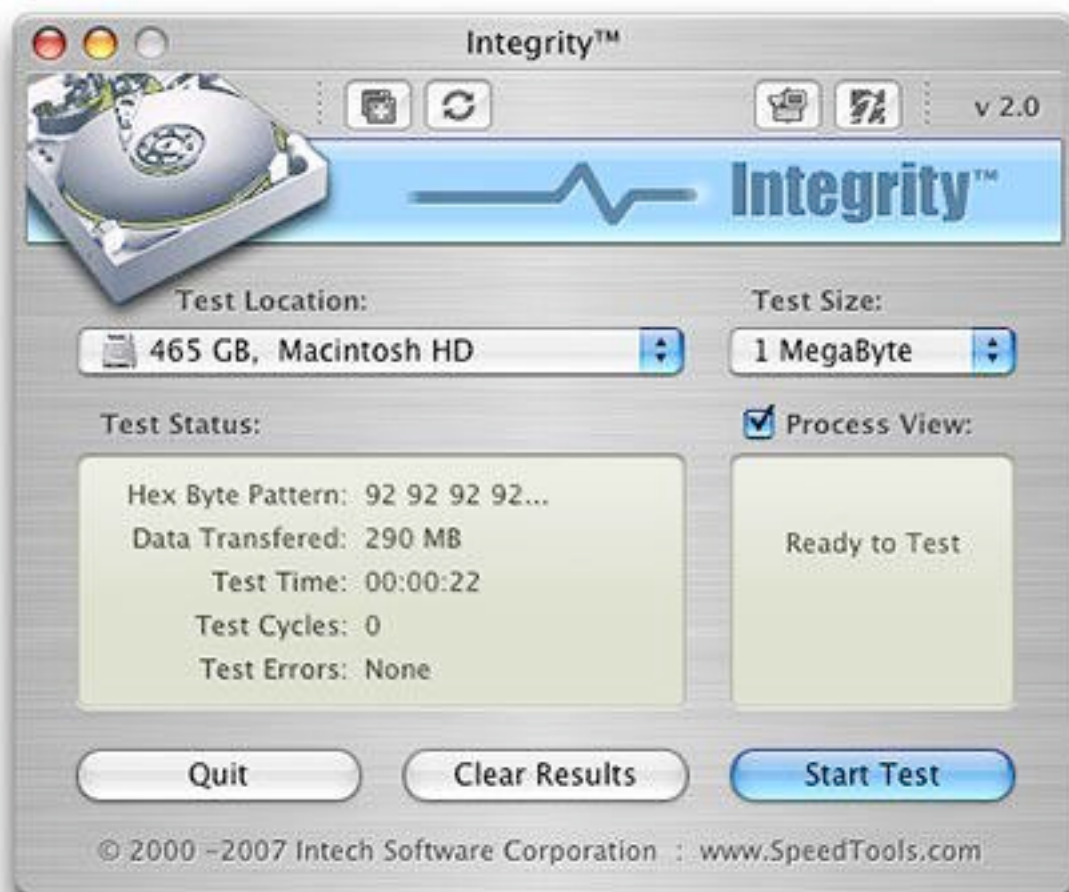
Figure 1.   The Integrity Utility Main Window

The Integrity utility is a totally different kind of disk testing utility compared with those which scan the medium of a storage device looking for bad sectors. Integrity exclusively tests for data becoming corrupted when transferred to and from your disk. Because the Integrity utility creates discrete, rotating data patterns, the data being retrieved can be compared against the data that was previously sent. Any mismatch will be immediately reported.

An Integrity test effectively reproduces the environment and steps that other applications use to save and retrieve data from your disk device(s). In other words, each test iteration verifies the reliability of everything involved with a data transfer process including various functions of the Operating System itself, an application's ability to save and retrieve data through the Operating System, the disk device driver, the bus that the disk device is connected to, the disk device data cable, the firmware of the disk device and the disk device cache.

Describing the Integrity Window

Test Location Menu:

This menu allows you choose a disk volume for testing. Alternatively, you may drag a disk icon from the Desktop on to the Integrity window. Disks and/or volumes listed in this popup menu, which are shown with gray volume names, are volumes which are either write protected or do not have enough disk space available for a test. These items will appear with a "lock" icon to their left.

Test Size Menu:

The selection in this menu represents the size of the file to be created and used for the reading and writing tests. Test sizes from 1MB to 10MB are available to choose from. For most people, a 1MB size is usually sufficient to detect any problems. However, larger sizes are available for those who wish to test data transfers that better simulate data transfers used by some special-purpose applications.

Test Status:

The Test Status area shows detailed information regarding the current running test. The Test Status information fields are described below:

Hex Byte Pattern: A textual sample of the created data pattern which is currently being written and read back during a test iteration.

Data Transferred: The combined amount of data which is written to and read back in from the storage device. It is displayed in Megabytes (MB).

Test Time: The Test Time display will monitor the exact amount of testing time that has elapsed during a test session.

Test Cycles: This field is incremented once every time the Hex pattern restarts with ones (effectively every 255 patterns).

Test Errors: This field represents each instance that the returning data did not match the test pattern data which was originally written. It is incremented after each error message.

The Test Status information will be preserved while pausing a test, and will be resumed from the previous state when a test has been restarted. If a new Test Location volume is selected, the Test Status information will automatically be cleared to prepare for the new test.

Process View:

This area of Integrity's window displays the active test action of each test pattern iteration (i.e. preparing the data, writing the data, reading the data and comparing the data). This feature may be turned off if desired. To turn off this feature, uncheck the checkbox just left of the Process View title. When the Process View has be turn off, a "Spinner" will be displayed in the Process View area instead.

The ToolBar Buttons:

The Toolbar buttons are featured at the top of Integrity's main window just below the title bar. Each button function is described below:

Open New Integrity Test – Clicking this button will open a new application instance of the Integrity utility. This function allows you to conduct multiple, independent volume tests at once.

Rescan for New Test Locations (Volumes) – This button item is used to rebuild the Test Location popup menu. This is useful for detecting a newly added a new storage device after the Integrity utility is already open, for example.

About Integrity – Clicking this button will open a new window which provides version and copyright information about the Integrity utility.

Go to Intech's Website – Clicking this button will automatically start your internet browser and display Intech's home page.

The Main Utility Buttons:

The "Start/Pause" Button – After selecting a Test Location, click the "Start" button to begin a test. When a test has begun, this button will turn into a "Pause" button, allowing you to stop the test at anytime.

The "Clear Results" Button – This button provides the ability to clear the Test Status information fields. It is not available to click while a test is running or when there is no Test Status information to clear.

The "Quit" Button – This button provides a quick way to stop a test (if one is running) and to quit the Integrity utility with one mouse click.

3 Using the Integrity™ Utility

Using Integrity

To use the Integrity utility, the selected test volume must have write permission and have at least 1MB free disk space available for the test file. You can test any mounted volume which meets this criteria, including RAM disks or remotely mounted network volumes. Volumes which do not meet the minimum test criteria will appear in the menu with a "Locked" icon and will be grayed–out and, therefore, not selectable.

Note: An iDisk will appear as a selectable volume in the Test Location menu, but it is not useful to test this using Integrity. iDisk's are virtual disks, not real disks, and reads and writes could be mapped to any hard disk, network drive or even your computer's RAM.

The Integrity test is not destructive to any existing data and may be run in the background if desired. However, testing on low speed devices may result in poor responsiveness from your computer while a test is running.

To start a test, select a disk/volume using the "Test Location" popup menu in the main window and click the "Start" button. The "Start" button will change to a "Pause" button and the test will begin. You may quit or pause a test at anytime. Clicking the "Start" button after pausing will resume the test from the same state just prior to pausing.

Once an Integrity test has been initiated, it will continue to test indefinitely until either the "Pause" or "Quit" buttons has been clicked. As a result, the following warning can be extremely important depending on the selected device and should be read and followed carefully.

Warning: Intech DOES NOT recommend extensive testing with devices which may have a limitation on the total number of times you can write to the media, such as with certain types of "phase–change" based devices. If you are in doubt, contact the manufacturer of your drive product and verify that there is no significant limit to the number of times you can write to your device. Because hard disk devices have no real write count limitation, this warning does not apply to them.

Integrity Usage Recommendations

⬤ For devices connected to a SCSI, ATA or SATA bus, Intech recommends at least 2 hours of continuous testing to feel reasonably secure about the data transferring process. However, at your earliest opportunity, testing overnight or for a weekend duration is preferable.

⬤ If you add a new SCSI drive, you should also test every other SCSI hard drive which is connected to the same SCSI bus as well. This is because adding a new device can affect the signal quality for every other device which shares a common bus.

⬤ If you add a new ATA drive to form a Master/Slave disk drive pair, you should test both Master and Slave devices. If possible, for maximum effectiveness, test both disks at once using the "Open New Integrity Test" toolbar button.

⬤ For USB and FireWire devices, we recommend a minimum of 24 hours of continuous testing. A full weekend is highly recommended as errors in these drive configurations tend to be more difficult to detect.

Disclaimer: Although Intech believes that the Integrity utility can be very effective at detecting data signal and other various disk communication problems, Intech cannot not guarantee that the Integrity utility will be able to detect every possible error.

Understanding Test Errors

There are effectively three different error classifications, two of which Integrity will report and attempt to provide some level of detail for. The other error type is a lockup and/or system crash. If a lockup or system crash occurs while testing a disk, this situation should be considered a serious configuration and/or hardware error and should be corrected before attempting to do any serious work on your computer.

System and File System Errors: This classification of error is not always a configuration or hardware related error. On occasion, Integrity may report an error if there is not enough memory to conduct a test or maybe you don't have sufficient privileges to read or write to the test disk, for example. Clearly, errors like these are not indicative of trouble with your disk device. However, nearly all other System and/or File System errors that Integrity may report are usually a sign of serious trouble.

Integrity has been supplemented with a File System Error lookup table. This means that for many File System errors, Integrity can provide a definition of the error when it happens. As such, read the Integrity error messages carefully so that you can determine the severity of the situation.

Data Integrity Errors: Errors which involve mismatched data patterns or unmatched write vs. read data amounts are serious errors. An example of a data integrity error message is shown in Figure 2 below.
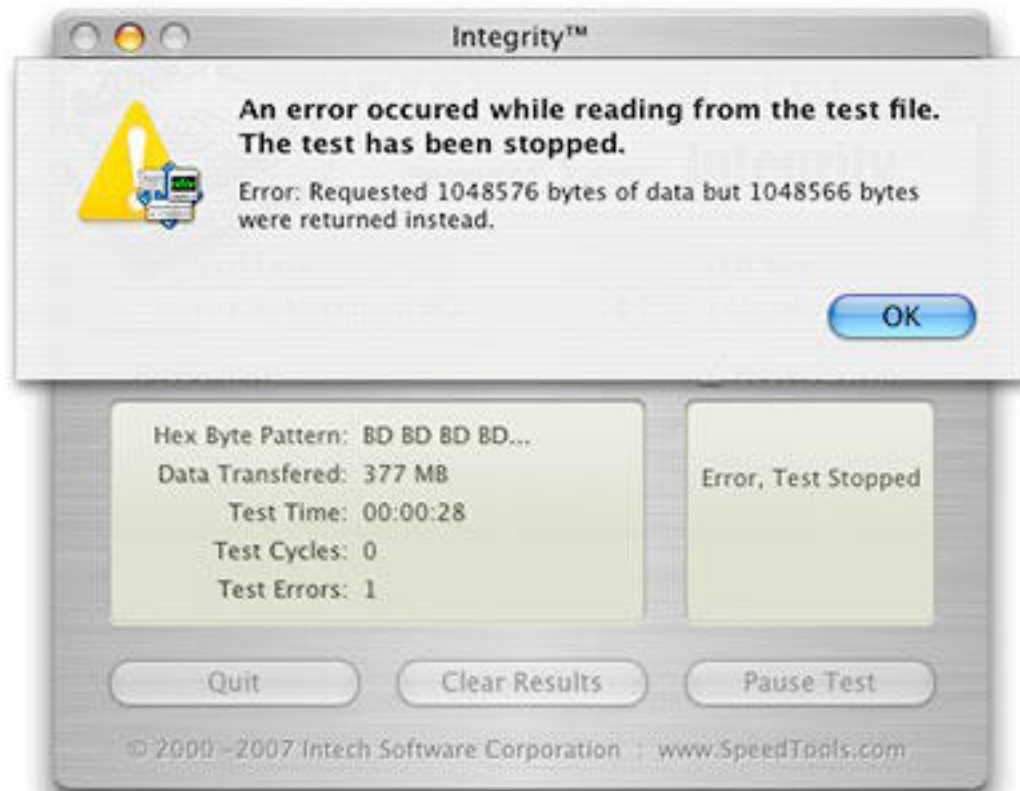

Figure 2. **Data Integrity Error Message**

For all devices, Intech believes that a single data integrity error (where the data read does not match the written data) is still one too many. However, the final decision about errors and the device's trustworthiness is ultimately yours.