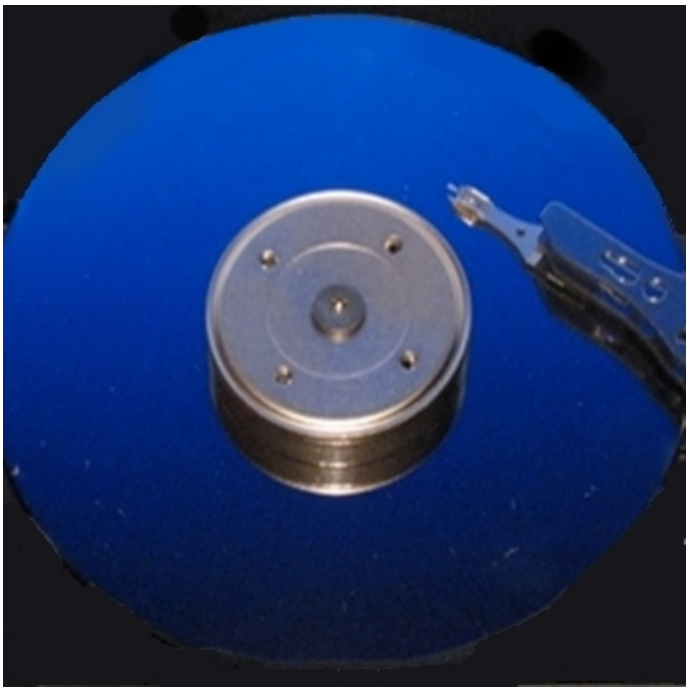


Scannerz

Product Profile

Software and Computer Systems Company, LLC
http://www.scsc-online.com

What is *Scannerz*?

Scannerz™ is a hard drive and system scanning tool designed to detect both developing and existing flaws in hard drives and their associated hardware. Unlike many other drive related tools developed for Mac's, Scannerz is hardware oriented, whereas others tend to be file system oriented. Scannerz can, if troubleshooting procedures are followed, help a user determine whether the problems they may be having are truly drive problems, or whether they may be caused by something else, such as a bad drive cable, an intermittent trace or failing component on a logic board, or possibly even the operating system itself.

Scannerz works with MacOS® 10.5 (Leopard), 10.6 (Snow Leopard), 10.7 (Lion), and 10.8 (Mountain Lion) using PowerPC™ G4 or G5 processors, and all Intel® based Macintosh systems. Scannerz should be used only on Apple® computers.

Scannerz now supports all variants of Core Storage, which was partially introduced in MacOS 10.7 and updated in MacOS 10.8. Scannerz can separate out Core Storage multi-volume/drive components, such as those in a Fusion Drive, and allow the user to test each component individually. It also supports Apple RAID as well as most versions of hardware implemented RAID.

What are *FSE-Lite* and *FSE*?

The base Scannerz package comes with another product named FSE-Lite™, which is included at no charge. The name of this package is ***Scannerz with FSE-Lite.*** An optional, upgraded package, named ***Scannerz with FSE*** consists of Scannerz and the fully featured version of FSE at a price that's a little higher. We recommend users purchase the ***Scannerz with FSE*** license package because FSE is much more capable than FSE-LIte.

Both FSE and FSE-Lite are file system event monitors, with FSE being much more sophisticated than FSE-Lite. Both FSE and FSE-Lite can detect, display, and optionally log file system activity that may mislead an individual into believing a drive or hardware problem exists, when in fact it's an operating system or application problem. Whereas FSE-Lite is really limited to this one function, FSE can, by the use of customized profiles, perform many other tasks. Download and review the document titled ***FSE and FSE-Lite Product Profile*** from SCSC's web site to help determine which product is right for you.

What Does Scannerz Do?

In a nutshell, Scannerz looks for problems on hard drives and their volumes as well as the associated hardware that controls the drive. Scannerz does this by monitoring and exercising the entire data path associated with the drive, CPU, RAM, the I/O controller, and any other interface circuitry that may be present in the path to the drive. Scannerz looks not only for I/O errors, but also timing irregularities. In Scannerz terminology, an irregularity is an operation during a test that took more time to complete than it should have.

Other drive testing products on the market typically attempt to read data from the drive, and if they detect a failed READ operation which generates an I/O error, they inform the user that the drive has a media problem (bad sector.) This approach is simplistic because I/O errors, or failed READ operations, can be caused by a complete or partial failure of any component in the data path that ultimately originates in the RAM/CPU interface and runs through the I/O controller and other interface components to the drive. If the problem is not actually in the drive itself but somewhere in the support circuitry, such applications will misinform the user that the drive has problems. The end result is often that the user ends up replacing the drive only to find out that the problem still persists. Additionally, such products completely fail to recognize a weak sector on a drive, because as far as they're concerned, if it can be read, there's not a problem. A weak sector is one that is either damaged or losing it's ability to retain information, and the system typically needs to try and re-try reading it before it finally gets data out of it – it also often turns into a bad sector over time.

Scannerz differs from other products in that it allows the user to easily determine whether or not the drive or a system component is the source of problems, and it can detect both I/O errors and irregularities. The most common cause of I/O errors related to the drive's platters or media is a bad sector on the drive. The most common cause of an irregularity related to the drive's platters or media is a weak sector. The most common causes of I/O errors and irregularities that are related to another system component are typically bad cables or connectors somewhere in the system where intermittent contact exists.

A “real world” example of intermittent contact would be a loose light bulb in a fixture – the light flickers on and off as the bulb makes and breaks contact with its electrical source. The exact same thing can occur within a computer system if there's an intermittent problem of some sort in the data lines, but instead of being a simple power source, the electrical lines carry data. Temporary periods of loss and reconnection during data transmission cause the components to continually re-try sending the data. If the problem is truly intermittent, the operation will succeed, and Scannerz will detect this as an irregularity, but if the connection is lost for a long enough period of time, this will be reported as an I/O error, even though the drive may be in perfect working order.

When evaluating a problem with Scannerz, determining whether or not repeatability

exists is critical. Like a bad DVD or a vinyl record that skips at a certain point, media problems with a hard drive are repeatable. If a hard drive has bad or weak sectors, they will always occur at the exact same points during a test. If a test using Scannerz produces errors or irregularities that are not repeatable, then the source of the problem is usually being caused by another component in the path running between the CPU and RAM to the hard drive. In most cases, the source of the problem will be a bad cable or connector, but in extreme cases it might point at problems in the logic board.

The process for testing a drive and its subsystem components is as follows:

1. Perform the initial test on the entire drive, typically in normal mode.
2. If no problem is found, the test is complete, and no further steps are needed.
3. If a problem is found, the user reviews the test data and report to find the location of the problems on the drive.
4. The user enters cursory scan mode and retests the problem areas, *not the entire drive,* as identified in the test data.
5. If the re-scan has repeatable results, the drive itself has media problems (bad or weak sectors) and it needs to be repaired or replaced. If the results can't be repeated, then the problem is with another system component, and the user should either implement path isolation procedures as described in Scannerz documentation, or take the system to a service center for further evaluation.

Scannerz is the only commercial drive testing product currently available for Mac's that allows this type of testing to be performed. The re-scan in cursory mode is typically done quickly and usually in a matter of minutes. This can't be done using other drive testing tools in any timely manner. It should also be noted that most system problems will often be traced down to nothing more complicated than faulty connections or bad cables, rather than the logic board itself.

In addition, Scannerz monitors the drive's performance parameters over an extended period of time. As hard drives age, due to component wear, they will begin to show signs of degradation when the wear starts impeding performance. Scannerz will compare current test data done in normal testing to that of the original scans. If degradation becomes evident, Scannerz can warn the user of an emerging problem, usually before S.M.A.R.T. based systems even become aware of them.

Finally Scannerz performs seek scan tests on a drive to ensure that its ability to position and retrieve data from point to point on the hard drive is working properly. If a drive has excessive wear or failing bearings associated with the drives seek mechanisms, these might not show up at all in a surface scan test, because such a test only increments the seek mechanisms of a drive in a track by track manner. Scannerz seek test will sweep from the extreme regions of a drive's platters down to a track by track test. Scannerz is the only major product on the market with this capability.

What Features Does Scannerz Have?

Scannerz features the following:

- **Normal Mode Testing:** Normal mode testing is typically done on a drive for initial or periodic testing to either determine if a drive has problems or problems are beginning to develop. A normal mode test can be interrupted, terminated and resumed at a later time, thus the user doesn't need to lock their system up for hours on end to complete a test. A complete normal mode test will perform both a surface scan test and a seek scan test on the drive. When a normal mode test is complete, Scannerz analyzes the test data from the current test to that of the original scans, and warns the user if there are problems beginning to emerge.

- **Cursory Mode Testing:** Cursory mode testing is typically used for troubleshooting and verifying a problem. Cursory mode tests can be configured to scan limited regions of the drive's surface to confirm the presence of problems or to help isolate other problems, such as bad cables. Cursory mode tests can perform surface scan tests, seek scan tests, or both. This mode is often used in surface scan mode to help identify non-drive related problems, such as a bad external drive cable or connector.

- **High Performance Scanning:** Scannerz has been optimized to provide high performance scanning during all tests. This has been done by selecting optimal scan buffer sizes for drive scanning and minimizing the user interface by keeping the user interface extremely simple and easy to use.

- **Stop, Start, and Resume Testing:** Because of the high storage capacity of some of todays drives, requiring a user to perform a test on a drive in one session can be incredibly time consuming. To overcome this, Scannerz allows a user to start, stop, and resume a normal mode test right where it left off. A user may be able to break up a test and spread it out over several different sessions, or resume the test on another day.

- **S.M.A.R.T. Monitoring:** During all tests, Scannerz will monitor the S.M.A.R.T. status of a drive and if a significant failure is detected, it will warn the user of it.

This type of test is done in the background at one minute intervals during surface scan tests and is part of the surface scan test regiment – it is not a selectable test. This is only applicable to drives that support S.M.A.R.T. technology. FireWire and USB drives do not currently report S.M.A.R.T. status to the operating system.

- **Report Generation:** At the end of a normal mode test on a drive, regardless of whether or not the test has been stopped and resumed one or more times, Scannerz will issue a summary report on the overall test results in rich text format.

- **The Logging Window:** Although the user interface will display test results in real time, detailed test results are stored in a log file. The logging window provides a snapshot of the logging activity in real time as the log is updated.

- **Preferences:** Scannerz allows the user to set some parameters that will apply to all tests. The preferences allow Scannerz to automatically stop a test if a certain number of errors have been obtained, and to probe into bad regions of a drive to determine the severity of damage.

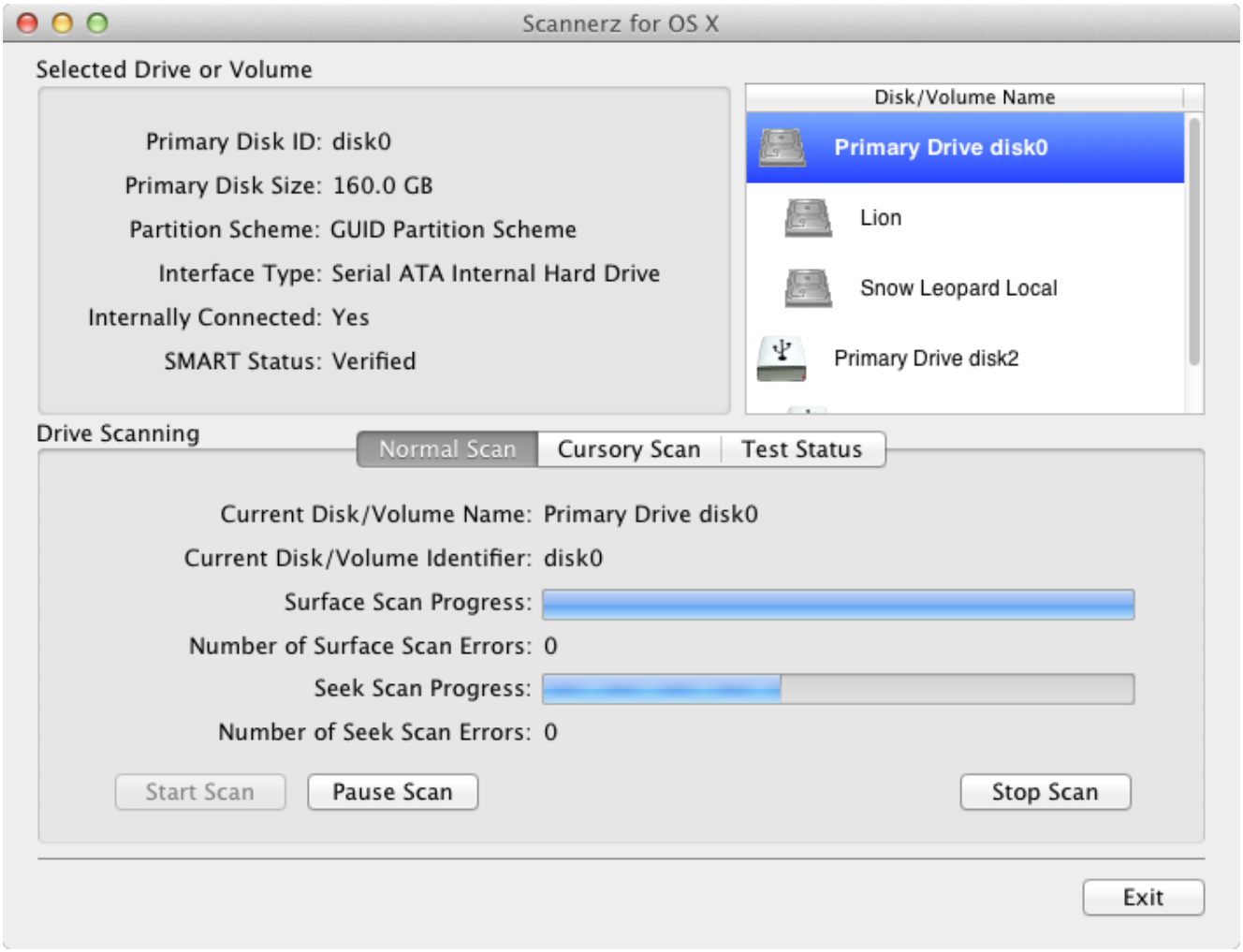
- **FSE or FSE-LIte:** Scannerz comes, depending on the license package purchased, with FSE or FSE-Lite. These tools can be used to assist Scannerz during tests to detect abnormal loading of the system by background processes the user was not aware of. Abnormal loading of the operating system can cause a system to appear to have problems when none really exist.

- **Ease of Use:** Scannerz has been designed to be incredibly easy to use.

How Difficult is Scannerz to Use?

Not difficult at all. The user interface employed by Scannerz has been deliberately designed to be as simple as possible. The following section illustrates Scannerz in actual use. Additional screen shots may be viewed by visiting our web site.

The screen shot on the following page illustrates the Scannerz user interface for a scan being performed in normal scanning mode.

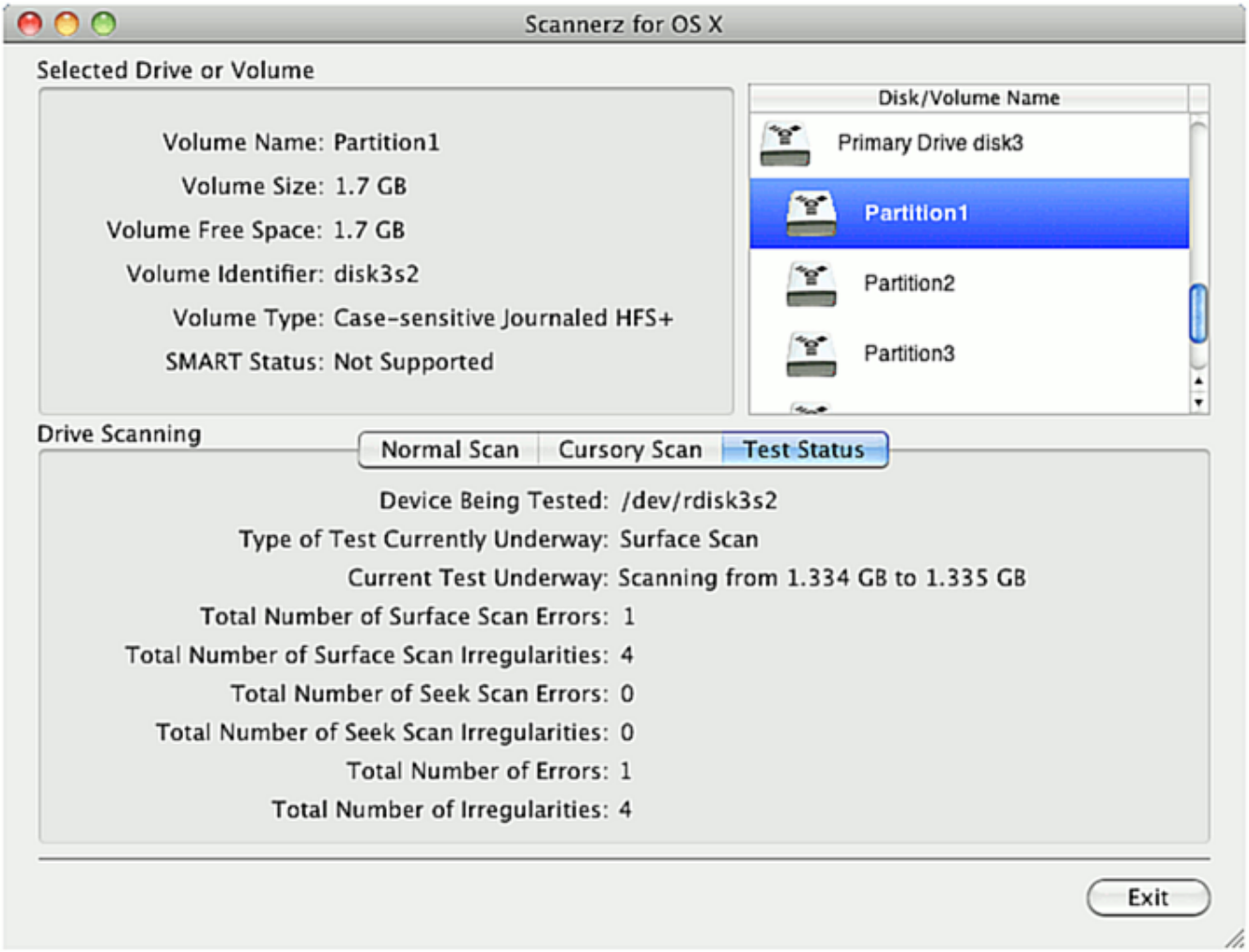


Scannerz Running a Normal Mode Test

For scanning in normal mode, all a user needs to do to start a test is click on the drive or volume they wish to test, click on the tabbed window to select the type of test, and then click on the “Start” button. That's it! Scannerz does the rest. Remember, in normal mode, Scannerz can stop a test, save its data, and then resume the test on another day or at a later time. A system doesn't need to be tied up for hours on end doing a scan on a drive if it needs to be used for other things.

The picture above shows a test well on it's way to completion with the surface scan 100% done and the seek scan about 40% done.

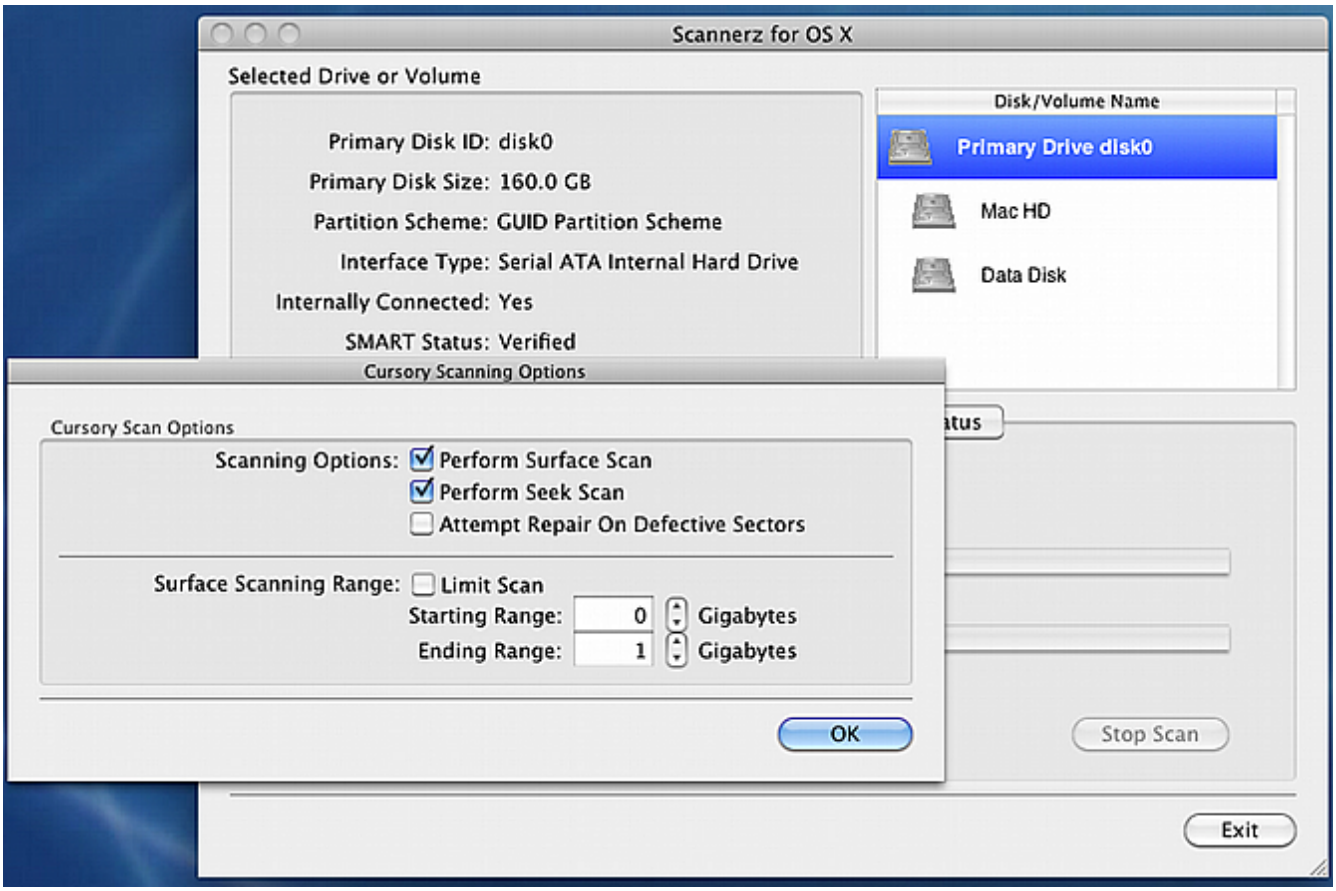
More detailed test data is seen by selecting the “Test Status” tab, which reveals details about the actual test in process. The screen capture on the next page illustrates this on a drive that is in the process of failing a test.



Test Status Tab Selected to Reveal Specific Test Details as They Occur

As seen in the screen shot above, this drive has reported one surface scan error an four irregularities. In this particular case, a cursory scan over the problematic region will be repeatable indicating that the drive's media has problems. The scan error is caused by a bad sector, and the irregularities are caused by weak sectors. It is not uncommon for a bad sectors and weak sectors to be found in the same regions of a drive's media.

In the event Scannerz detects problems, they can be evaluated in cursory mode, which allows the user to perform surface scans on limited sections of the drive, limit testing to a surface scan or seek scan test or both, and attempt to repair a drive that clearly has problems. Cursory mode tests are configured using the dialog as shown on the following page.



Configuring a Test in Cursory Mode

Cursory mode is most useful in the following cases:

1. Problems or irregularities have been detected and need to be verified without re-doing a scan on an entire drive.

2. Erratic test results imply the problem is not the drive itself, but possibly in the controlling circuitry and/or cabling or connectors.

3. Verify whether a suspect drive is even working properly without needing to do a complete scan.

4. Attempt a surface repair on a drive if all other attempts described in the users manual have failed.

Typically, normal mode is used to ensure a drive and its associated circuitry are working properly. Cursory mode is used when problems have already been detected.

What are the Signs of a Bad Drive?

The symptoms of problems with a hard drive and its associated circuitry can range from the subtle to the extreme. In subtle cases, a user may experience slow boot-ups, delays starting some applications often accompanied with “spinning beach balls,” and the need to frequently do disk repairs using the operating system's disk utility, sometimes with marginal success. If the problem is not drive related, but rather a problem associated with the drives control circuitry, results are usually erratic and not repeatable in a consistent manner. In extreme cases of failure, the drive may not be bootable or be unrecognized by the system, and if the drive itself is the problem, it is often accompanied by abnormal noises coming from the drive. If problems are allowed to grow, unchecked and unverified, the end result may be significant or complete loss of all data on the drive.

Scannerz was created so users could periodically scan their drives for these problems and catch them before they go from subtle, often correctable problems to the extreme case, where the drive can't be restored and there may be significant if not complete data loss.

Who Should Use Scannerz?

Anyone that considers the data on their drive important.

What Won't Scannerz Do?

Scannerz is a diagnostic tool, not a repair tool. The fact is that many of the tools needed to make a problematic drive good again are already there on the users system, assuming it has problems that can be fixed. Scannerz job is not to repair a drive, it's job is to tell the user that problems exist or are in the process of developing that need to be addressed.

As stated previously, Scannerz is hardware oriented, not file system oriented. It will not find lost files, recreate corrupt indices, reformat a drive, or defragment a drive. The purpose of using Scannerz is to verify that the hardware and media associated with data storage are sound, and warn people when problems are either in the process of developing or already exist.

Contact Information

If you have more questions, please visit our web site at:

http://www.scsc-online.com

For specific questions about the product, feel free to drop us a line at the following e-mail addresses:

Sales: sales@scsc-online.com
Support: support@scsc-online.com

Thank you for your interest in Scannerz.

Legal Information