nero

Multimedia Suite 10

Manual

Nero DiscSpeed

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1 Start Successfully

1.1 About the Manual

This manual is intended for all users who want to learn how to use Nero DiscSpeed. It is process-based and explains how to achieve a specific objective on a step-by-step basis.

To make best use of this documentation, please note the following conventions:

	Indicates warnings, preconditions or instructions that have to be precisely followed.
	Indicates additional information or advice.
1. Start …	The number at the beginning of a line indicates a prompt for action. Carry out these actions in the order specified.
→	Indicates an intermediate result.
➔	Indicates a result.
OK	Indicates text passages or buttons that appear in the program interface. They are shown in boldface.
(see…)	Indicates references to other chapters. They are executed as links and are shown in red and underlined.
[…]	Indicates keyboard shortcuts for entering commands.

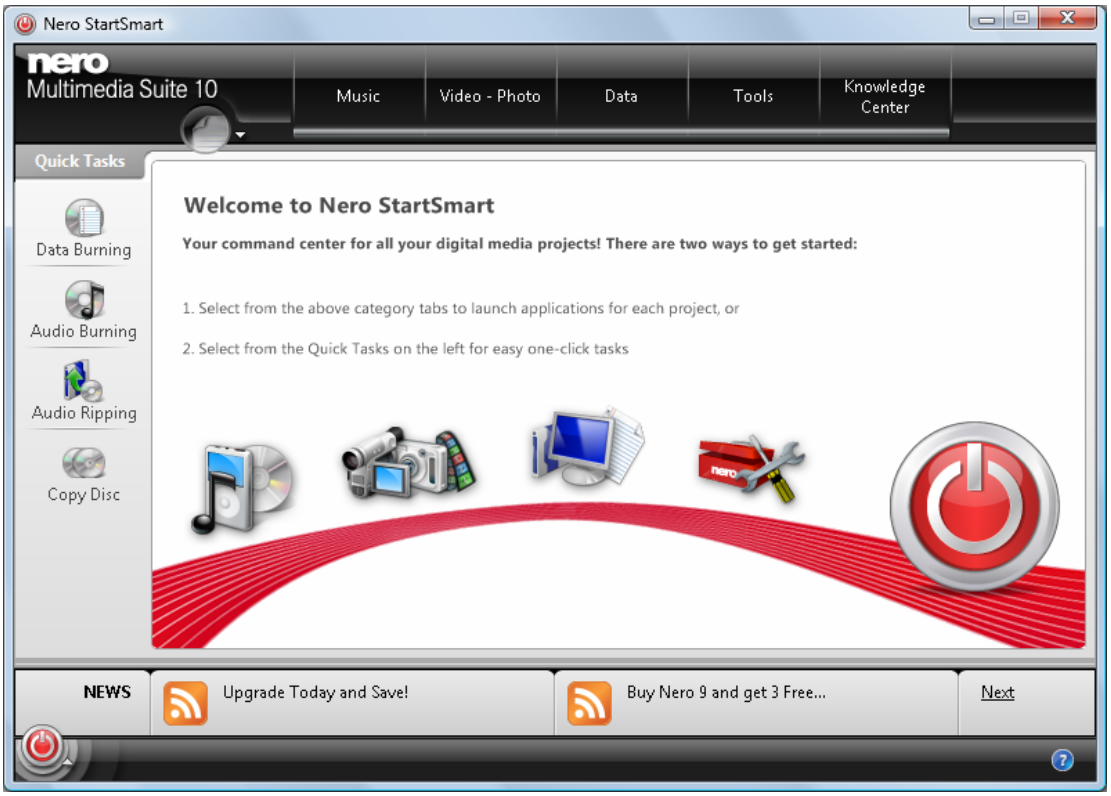
1.2 About Nero DiscSpeed

Nero DiscSpeed tells you the speed of the available CD/DVD drives. Results can be viewed either as a graph or as a test log. Nero DiscSpeed also creates special test media for data and audio.

2 Starting The Program

To start Nero DiscSpeed via Nero StartSmart, proceed as follows:

1. Click the **Nero StartSmart** icon.
   → The Nero StartSmart window is opened.
2. Click the  button.
   → The list of Nero applications is displayed.



Nero StartSmart window

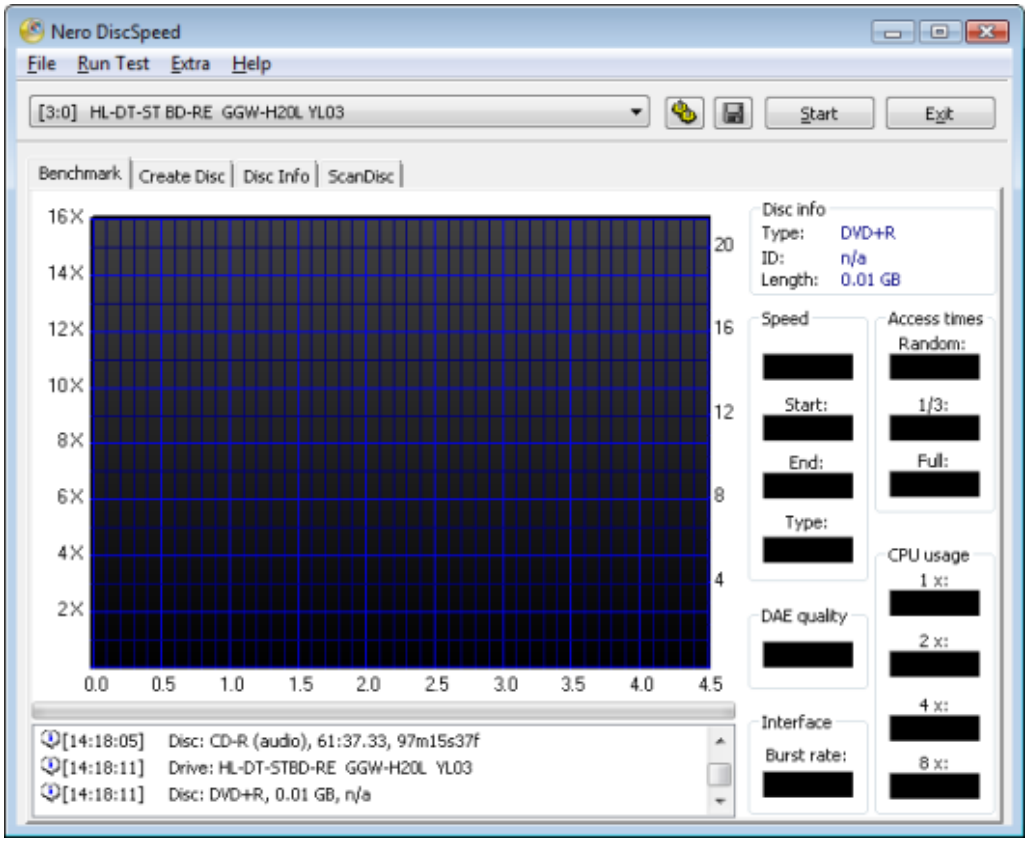
3. Select the **Toolbox** > Nero DiscSpeed entry in this selection list.
   → The Nero DiscSpeed window is opened.
   → You have launched Nero DiscSpeed via Nero StartSmart.

3 Main Screen

The Nero DiscSpeed main screen is the starting point for all actions that you perform using Nero DiscSpeed.

The drop-down menu lists the optical drives available on the computer using their exact model designations. It also displays the version number of the firmware installed on the drive.

You can switch between tabs within the main screen. These tabs are used to carry out the different tests and to display information regarding them.



Main Screen

The menu bar in the main screen has four menus.

The following entries are available in the **File** menu:

Load Results	Contains the following two sub-entries: **Load Single File** and **Database**. **Load Single File:** Loads a saved test file. **Database**: Loads several files at the same time. This way, you can compare test results and/or the efficiency of optical drives. Only test files saved as binary files with the extension *.dat can be loaded again.

Save Results	Contains the following three sub-entries: **Binary (.dat)**, **Text (.csv)**, and **HTML**. **Binary (.dat)**: Saves the test results as a binary file. Only test files saved as binary files with the extension *.dat can be loaded again. Use this format if you want to open the test results in Nero DiscSpeed or in the Nero DiscSpeed database and compare them. **Text (.csv):** Saves the test results as a text file that you can open with any text editor. **HTML**: Saves the test results in a diagram that you can open with any Web browser. In the **Options** window, under the **Save** navigation entry, you can define how much data will be saved in the file. If the **Include status** check box is enabled, the diagram and all other test results are saved; if it is cleared, only the graph is saved.
Capture to clipboard	Copies a snapshot of Nero DiscSpeed to the clipboard. The results in all further displays are lost. You must save the snapshot before removing the disc you are testing from the optical drive. Otherwise the image will be deleted from the clipboard.
Capture to file	The **Save as** dialog appears. Opens the Save As window, where you can save the snapshot on your hard drive.
Options	Opens the **Nero DiscSpeed - Options** window, where you can define settings for the user interface, for the save function, and for various tests.
Exit	Exits Nero DiscSpeed.

The following entries are available in the **Run Test** menu:

Selected	Starts a standard test series. All standard tests that you selected in the **Nero DiscSpeed - Options** window, under the **Standard Tests** navigation entry, are run.
All	Starts the standard test series. All the standard tests that are listed in the **Nero DiscSpeed - Options** window, under the **Standard Tests** navigation entry, are run.
Transfer Rate	Starts the transfer rate test.
DAE Quality	Starts the DAE quality test.
Access/Seek Times	Starts the access/seek times test.
CPU Usage	Starts the CPU usage test.
Burst Rate	Starts the burst rate test.

Spin Up/Down	Starts the spin up/down test.
Load/Eject	Starts the load/eject test.
Create Data Disc	Starts the create data disc test.

The following entries are available in the **Extra** menu:

Advanced DAE Quality Test	Contains the following three sub-entries: **Create Test CD**, **Run Test**, and **Error Test**. **Create Test CD**: Opens the **Nero DiscSpeed - DAE Test Disc** window, where you can burn a special test disc in order to run the advanced DAE quality test. **Run Test**: Opens the **Advanced DAE Quality Test** window, where you can run the advanced DAE quality test with the help of a previously created test disc. **Error Test**: Contains the **Create Image** and **Run Test** sub-entries. **Create Image**: Opens the **Nero DiscSpeed - Advanced DAE - Create Image** window, where you can create an image file of the test disc. You need a test disc type **A-BEX** (**TCD-714R**, **TCD-721R**, or **TCD-726**) **Run Test**: Opens the **Nero DiscSpeed - Advanced DAE Error Correction Test** window, where you can read the data from an A-BEX disc and compare it with the data of the created image file.
Overburning test	Opens the **Nero DiscSpeed - Overburning Test** window, where you can simulate the overburning test.
Erasing a Disc	Opens the **Nero DiscSpeed - Erase** window, where you can erase data from rewritable discs.
Bit Setting	Opens the **Nero DiscSpeed – Bit setting** window, where you can change the bit settings for a DVD recorder.

The following entries are available in the **Help** menu:

Help	Opens the **Help Information** window, where you can download the manual for Nero DiscSpeed from the Nero website.
About	Opens the **About Nero DiscSpeed** window, where you can find the exact version number of Nero DiscSpeed.

The following buttons are available:

	Opens the **Nero DiscSpeed - Options** window, where you can define settings for the user interface, for the save function, and for various tests.

Start	Starts the test. The test that is started depends on the selected tab.
Stop	Stops the test in progress.
Exit	Closes Nero DiscSpeed.

The following tabs are available:

Benchmark	Displays the **Benchmark** tab. Here you can run the standard tests offered by the program. This is also where the results are displayed.
Create Disc	Displays the **Create Disc** tab. Here you can run an advanced test for writing to disc.
Disc Info	Displays the **Disc Info** tab, where you can find detailed information on the disc currently in the optical drive.
Disc Quality	Displays the **Disc Quality** tab. Here you can run a scan to test the quality of burned discs.
Scan Disc	Displays the **ScanDisc** tab. Here you can run a further quality test.

Whether the **Disc Quality** tab is available depends on the recorder that is installed.

See also

- Transfer rate → 14
- DAE Quality → 16
- Access/Seek Times → 16
- CPU Usage → 17
- Burst Rate → 17
- Spin Up/Down → 17
- Load/Eject → 17
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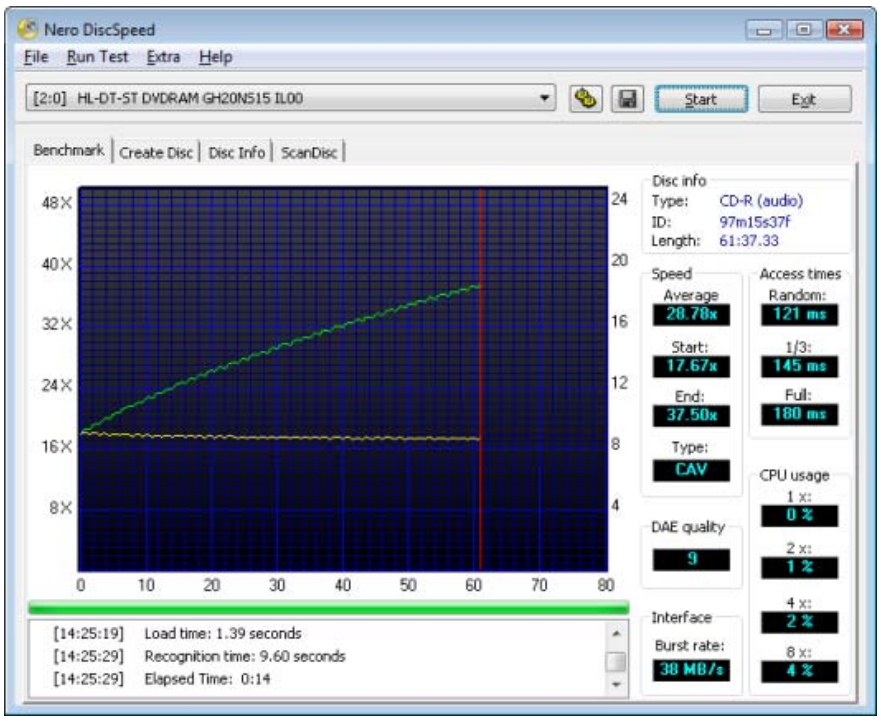
- Saving Test Data → 47
- Loading Test Data → 47

4 Benchmark Tab - Standard Tests

All standard tests are run in the main screen on the **Benchmark** tab. You can run tests individually or combined into a test series.

The following standard tests are available:

- Transfer rate
- DAE quality
- Access/Seek Times
- CPU usage
- Burst Rate
- Spin Up/Down
- Load/Eject
- Create Data Disc (Classic Version)



Standard Tests - Benchmark tab

You will find general information on the disc that is inserted in the drive in the **Disc Type** area, to the right of the graph. The following display panels are available:

Type	Shows the disc type of the disc in the drive. For some tests, the results achieved are conditional upon the disc type.
Length	Shows the storage capacity of the disc in the drive. In MB for CD's, in GB for DVD's.

4.1 Running an Individual Standard Test

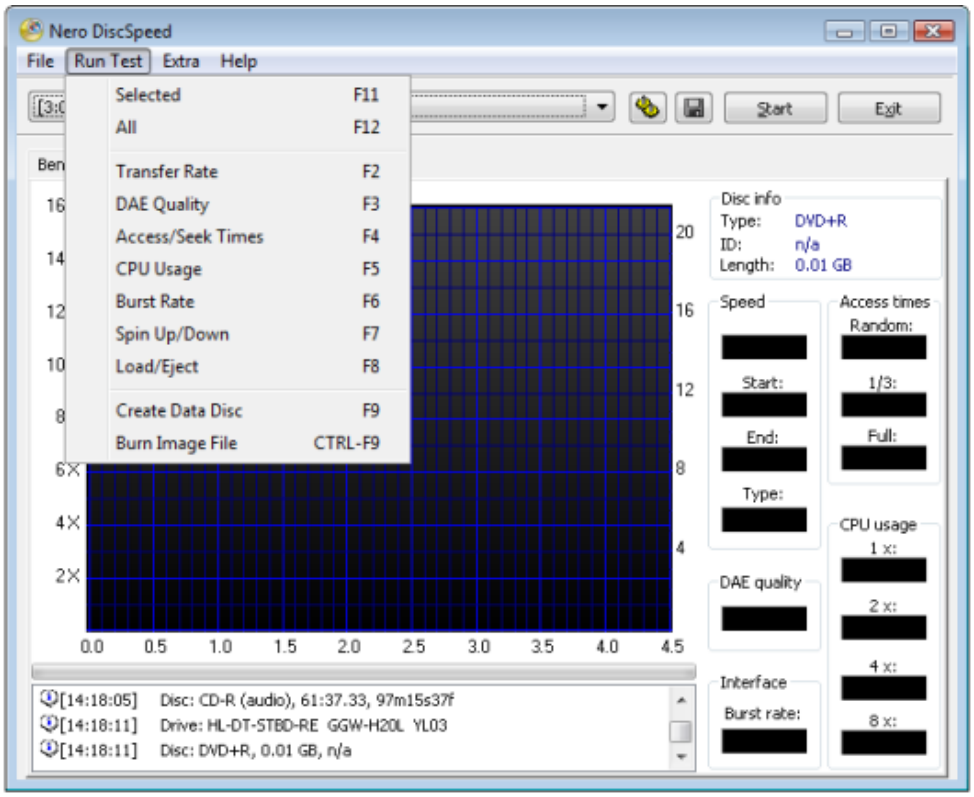
The following requirement must be fulfilled:

► The **Benchmark** tab is selected in the main screen.

To start an individual test, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert an appropriate disc into the optical drive.
3. Click the **Run Test** menu.

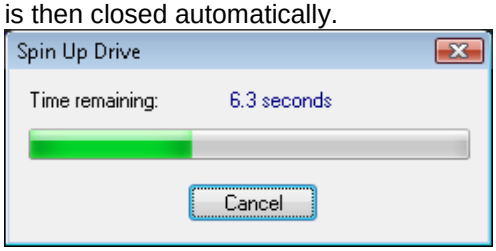
   → The **Run Test** menu is opened.



Standard Test - Selection

4. Select the desired test.

   → The **Spin Up Drive** window is displayed while the test is being prepared. The window is then closed automatically.



→ The test is run. You can follow the individual steps of the test process in the display area under the graph.
You can cancel a running test at any time by clicking the **Stop** button.

→ You can now see the result of the test in the graph and the relevant displays and save it.

See also

Saving Test Data → 47

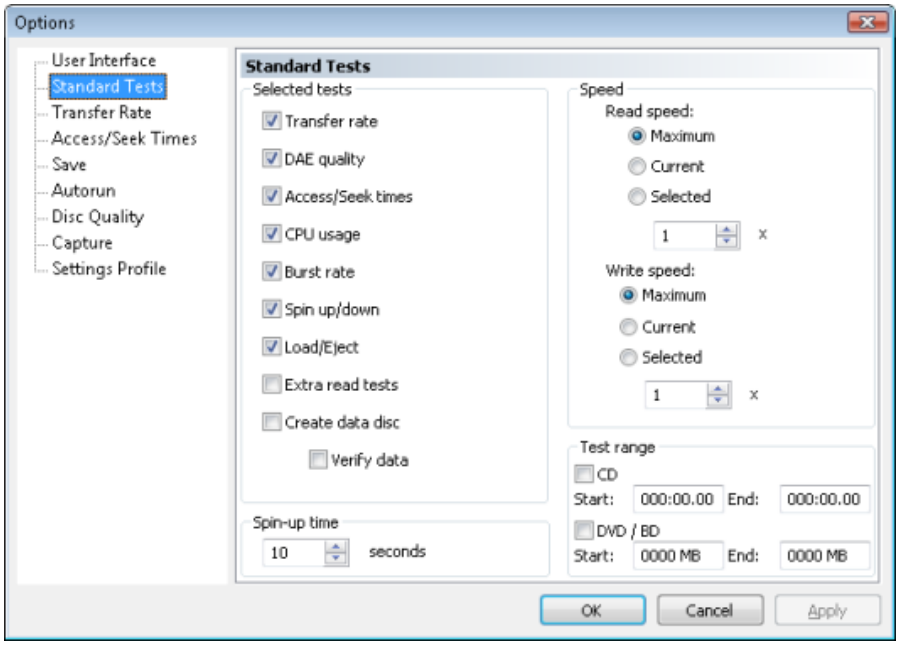
4.2 Running a Standard Test Series

The following requirement must be fulfilled:

► The **Benchmark** tab is selected in the main screen.

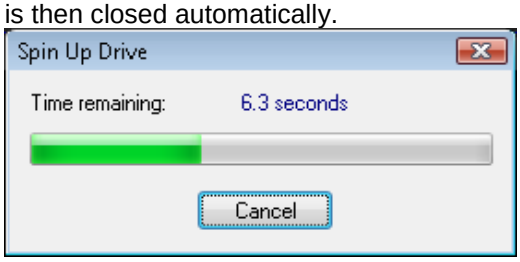
To start more than one test in succession, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. If you want to change the standard tests:
   1. Click the  button.
      → The **Nero DiscSpeed - Options** window is opened.
   2. Click the **Standard Tests** navigation entry.
      → The **Standard Tests** screen is displayed.

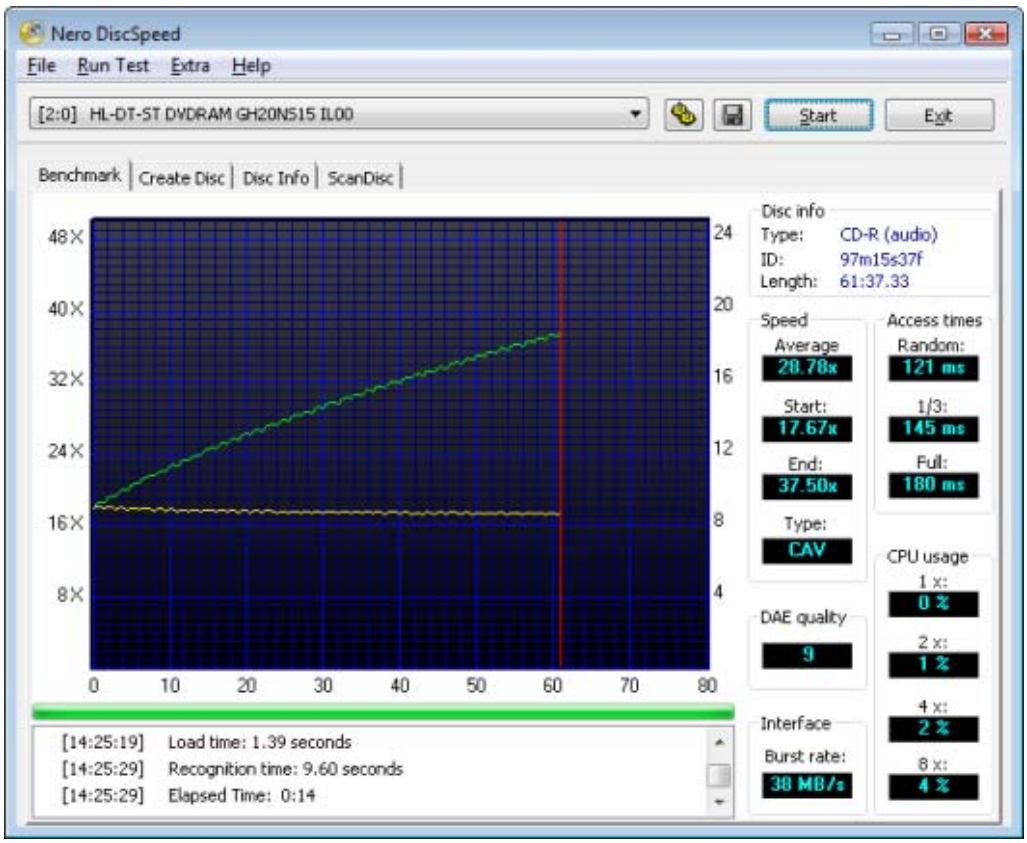


3. Select the check boxes for the tests that you want to run and clear the check boxes for all tests that you do not want to start.
4. Configure further settings for the enabled tests as desired (under the relevant navigation entries) and click the **OK** button.

3. Insert an appropriate disc into the optical drive.
4. Click the **Start** button.
   - → The **Spin Up Drive** window is displayed while the test is being prepared. The window is then closed automatically.



   - → The test is run. You can follow the individual steps of the test process in the display area under the graph.
     You can cancel a test in progress at any time by clicking the **Stop** button.
   - → You can now see the result of the test in the graph and the relevant displays and save it.



See also

- Saving Test Data → 47
- Nero DiscSpeed Options Window → 52

4.3 Transfer rate

The **Transfer rate** test measures the read speed of data, i.e. the speed at which data is read from a disc. If the disc inserted is blank, the test measures the write speed.

This test is suitable for testing an optical drive and for verifying the readability of burned discs (CDs or DVDs).

The results are displayed in the form of two curves in the graph. By default, the read speed is shown as a green line, and the rotational speed or angular velocity of the disc is shown as a yellow line.

The horizontal scale shows the storage capacity values (in MB for CD's and in GB for DVD's). The vertical scales show the read speed on the left and the rotational speed on the right in RPM x 1000.

With a dual layer disc, the graph shows two additional vertical lines: a red one for the full capacity of the disc and a pink one that divides the representation into two sections. Each section shows the measurement for one layer.

In addition, the test results are displayed in the **Speed** area, to the right of the graph.

If your main interest is testing optical drives, it is a good idea to use discs that are slightly damaged.

The following display panels are available in the Speed area:

Current/Average	Shows the varying speed over the course of the test. The average speed is displayed here when the test is finished.
Start	Shows the lowest speed determined over the course of the test. In a normal curve, the lowest speed is also the start speed. In an uneven curve, the lowest recorded speed is displayed here as the minimum value.
End	Shows the highest speed determined over the course of the test. In a normal curve, the highest speed is reached at the end. In an uneven curve, the highest recorded speed is displayed here as the maximum value.
Type	Shows the type of rotational speed. A disc can be read with the following types of rotational speed: **CAV** (constant angular velocity): With **constant angular velocity**, the disc rotates at a constant speed, which means the inner tracks travel at the slowest linear velocity. The linear velocity increases as you move away from the center towards the outer edge. The data rate remains constant while the data density decreases away from the center of the disc. **CLV** (constant linear velocity): With **constant linear velocity**, the

	rotational speed of the disc decreases as the laser moves away from the center of the disc. As a result, both the read speed and the data density and rate remain constant in all areas of the disc. **ZCLV** (zone CLV): If a disc is divided into several **CLV zones**, each one of them can be read and above all burned as separate logical areas by using CLV. 16x speed is a characteristic value for the innermost zone of a CD, after which the speed can be increased in stages. **PCAV** (partial CAV): In a **combination of CAV and CLV**, CAV technology is used in the inner area of the disc. When a certain linear velocity is reached, CLV technology is switched to towards the outer edge of the disc. In other words, the rotational speed remains constant until the read speed has reached a maximum value; the read speed then remains at a constant level while the rotational speed decreases.

See also

- Transfer Rate Navigation Entry → 56
- Disc Quality Entry → 62

4.4 DAE Quality

The **DAE quality** test comprises two partial measurements. The DAE quality test results are displayed in the **DAE Quality** area.

First, audio areas from three different points on the disc are read and stored on the hard drive. The same areas are read again and compared with the buffered data. The DAE quality is awarded a value between 0 and 10 (perfect quality, no differences) depending on the number of differences counted. The determined value is shown on the display panel.

Next, Nero DiscSpeed checks if the optical drive supports accurate streaming. If the **Accurate stream** check box is enabled, desired audio files can be precisely located on a disc whenever necessary.

If your optical drive performs poorly in the test, we recommend that you also enable a verification feature when ripping CD's.

4.5 Access/Seek Times

The **Access/seek times** test measures the access or seek times of optical drives for discs inserted in the drive in three partial measurements. The results of all three partial measurements are displayed in the **Access times** area, to the right of the graph.

Before starting the test, you can use the options to define whether you want to test the access time or the seek time, as well as how many times you want to run the test.

The following partial measurements are performed for seek or access times:

Random	Moves the read head to a random position on the disc.
1/3	Moves the read head from the start of the disc over the first third.
Full	Moves the read head from the start of the disc to its logical end, i.e. to the outermost position where data is saved on the disc.

See also

Access/Seek Times Navigation Entry → 58

4.6 CPU Usage

The **CPU usage** test measures the percentage utilization of the CPU (central processing unit) at various read and write speeds (**1x**, **2x**, **4x**, and **8x**). The results are displayed in the **CPU usage** area, to the right of the graph.

4.7 Burst Rate

The **Burst rate** test measures the maximum possible transmission rate from the optical drive to the computer.

Since optical drives are usually connected to the IDE channel of a motherboard with the corresponding cable, the test result in this case shows the transmission speed of the IDE channel.

If the optical drive is connected in a different manner, the test is useful nevertheless. You can use the result to check whether the connection is fast enough for a high burning speed.

The result of the measurement is shown in the **Interface** area, to the right of the graph. The value in the **Burst rate** display panel should always be greater than the maximum speed of the optical drive (e.g. greater than 21 MB/s for a DVD burner with 16x write speed).

The test results are only meaningful if data from the disc inserted in the drive is cached. Since many optical drives do not cache audio data on the hard drive, we recommend using data CD's for this test.

4.8 Spin Up/Down

The **Spin down** test measures how long it takes an optical drive to stop, while the **Spin up** test measures how long it takes before the optical drive can read data again after stopping.

The shorter the two times, the better the result. Faster optical drives have faster spin up/spin down times.

The results of both measurements are shown at the bottom of the screen, in the display area.

4.9 Load/Eject

The **Load/eject** test measures the time that an optical drive needs to load, detect, and eject a disc.

The time an optical drive needs to load and/or eject a disc should always be roughly the same, regardless of the disc type. The duration depends on how quickly the optical drive closes the tray and opens it again.

The time an optical drive needs to detect a disc that is inserted in the drive depends on the disc type. It takes longer to detect a multisession disc than a disc containing a single session.

The results of the measurements are displayed at the bottom of the screen, in the display area.

4.10 Create Data Disc (Classic Version)

The **Create data disc** test is available in its classic version on the **Benchmark** tab and as an advanced version on the **Create Disc** tab. You can use the classic test to analyze the read speed and the rotational speed. You can use the advanced test to also measure the buffer level and the CPU usage caused by the optical drive.

The classic test is run on the **Benchmark** tab, where the result is also displayed. The graph shows the curve for the write speed in this case, and the rotational speed of the disc on request.

The classic test is run in accordance with the settings you defined in the options under the **Transfer Rate** navigation entry (see).

If you do not want to show the rotational speed in the graph, disable the **Show RPM** check box in the options under the **Transfer Rate** navigation entry.

Previously selected binary data is written to a blank disc until the maximum disc capacity is reached. The number of files written differs according to the disc type, since a DVD holds significantly more data than a CD.

If you want to check your data and display the results in the display panel under the graph, enable the **Verify data** check box in the options under the **Standard Tests** navigation entry.

See also

Transfer Rate Navigation Entry → 56

5 Create Data Disc

5.1 Running the Create Data Disc Test

The following requirement must be fulfilled:

► The **Create Disc** tab is selected in the main screen.

To start the **Create data disc** test, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Configure the settings you want in the **Settings** area to the right of the graph.
3. Insert a blank disc in the optical drive if you are not running a simulation.
4. Click the **Start** button.

   → The test or burn process is run. You can follow the individual steps of the test process in the display area under the graph.
   You can cancel a running test at any time by clicking the **Stop** button.

   Always start the test using the **Start** button.
   As long as you are running this test, the entries in the **Run Test** menu will be grayed out. If you click **Run Test** > **Selected**, the test is automatically run on the **Benchmark** tab and the results of the classic version are displayed.

   → You can now see the results of the test in the graph and the relevant displays and save them.

See also

Saving Test Data → 47

5.2 Creating a Data Disc (Advanced Version)

The **Create data disc** test is available as an advanced version on the **Create Disc** tab and as a classic version on the **Benchmark** tab.

You can use the classic test to analyze the read speed and the rotational speed. You can use the advanced test to also measure the buffer level and the CPU usage caused by the optical drive.

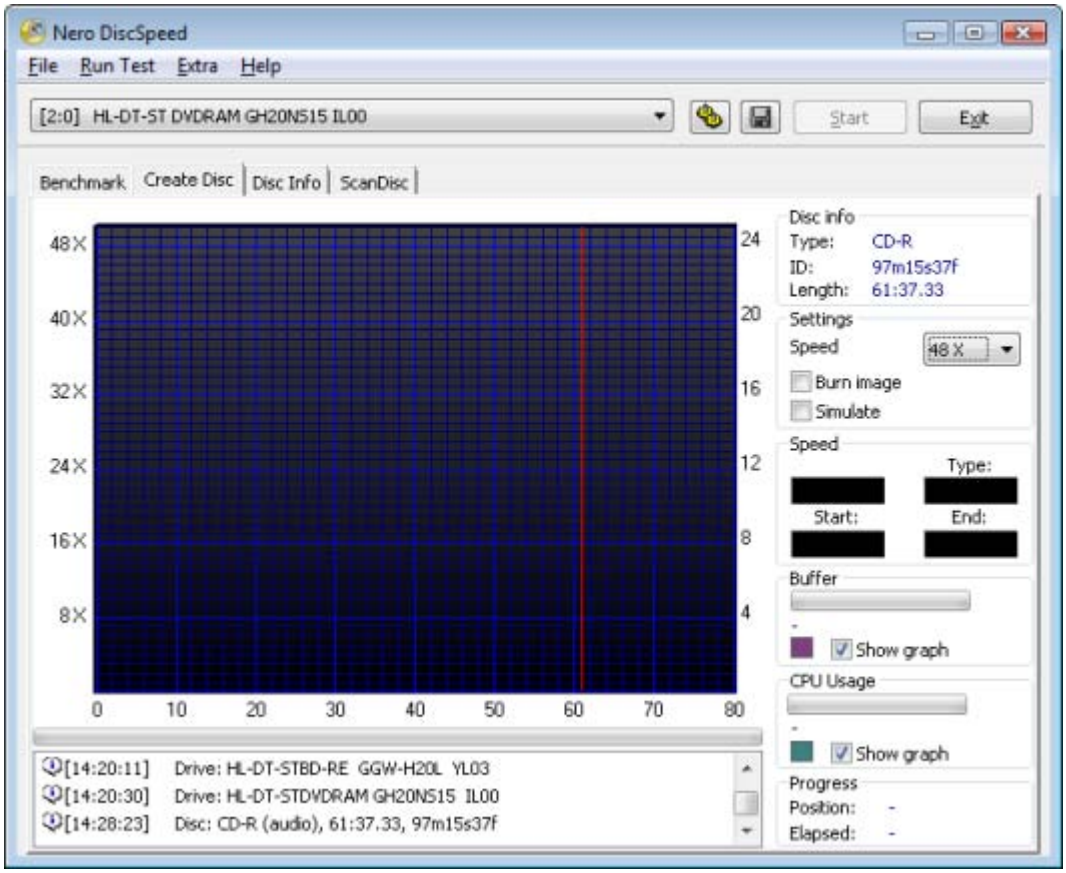
The advanced test is run on the **Create Disc** tab, and the result is also displayed here.

The results are displayed on the graph in the form of the following four curves:

- Writing Speed
- Rotation
- Buffer level
- CPU usage

The horizontal scale shows the values for disc capacity (in MB for CD's and in GB for DVD's). The vertical scales show the write speed on the left and the rotational speed on the right (in RPM x 1000).

A progress bar between the diagram and the display area shows the burning progress.



Create Disc tab

You will find general information on the disc that is inserted in the drive in the **Disc info** area, to the right of the graph. The following display panels are available:

Type	Shows the disc type of the disc in the drive.
ID	Shows the media code of the disc.
Length	Shows the recording capacity of the disc in the drive (in MB for CD's and GB for DVD's).

As a basic principle, all settings defined in the options apply to the standard test on the **Benchmark** tab. All settings affecting the advanced test are configured directly on the **Create Disc** tab.

The colors in the graph are an exception to this. If you want to change these colors, you can do so in the options under the **User Interface** navigation entry.

You can define necessary preferences for the test in the **Settings** area to the right of the graph. The following setting options are available:

Menu **Speed**	Defines the speed at which the test is run. The available entries in the drop-down menu vary depending on the disc in the drive.
Check box **Burn image**	If this check box is enabled, Nero DiscSpeed writes an image file that you have selected to the recordable disc instead of writing previously defined binary data.
Check box **Simulate**	If this check box is enabled, Nero DiscSpeed simulates the process to create all the test results instead of writing data on the recordable disc.

The test results are also displayed in the **Speed**, **Buffer**, **CPU Usage**, and **Progress** areas to the right of the graph. The following areas are available:

Speed	Shows the partial results of the speed test. **Current/Average** shows the varying speed over the course of the test. The average speed is displayed here when the test is finished. **Start** - Shows the lowest speed detected over the course of the test. In a normal curve, the lowest speed is also the start speed. In an uneven curve, the lowest recorded speed is displayed here as the minimum value. **Type** - Shows the type of rotational speed. **End** - Shows the highest speed determined over the course of the test. In a normal curve, the highest speed is reached at the end. In an uneven curve, the highest recorded speed is displayed here as the maximum value.
Buffer	Shows the percentage usage of the buffer during the write test, both graphically in the bar and numerically beside it. The values for the minimum buffer level, the maximum buffer level, and the average buffer level are listed below from left to right. These values are continuously refreshed over the course of the test. If the **Show graph** check box is enabled, a representation of the buffer level is plotted on the graph. The small colored square to the left shows the color of the line. You can change this color according to your requirements in the options under the **User Interface** navigation entry.

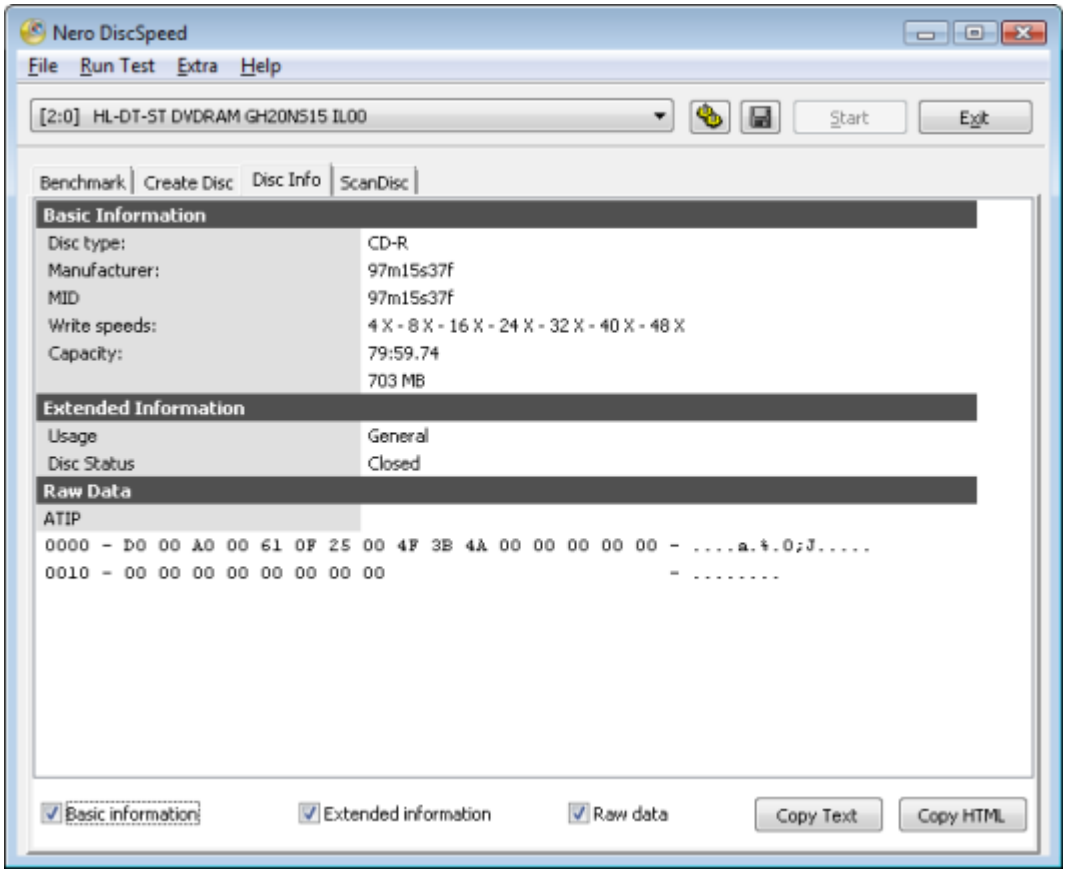
CPU usage	Shows the CPU usage during the write test graphically in the bar and numerically beside it. The values for the minimum CPU usage, the maximum CPU usage, and the average CPU usage are listed below from left to right. These values are continuously refreshed over the course of the test. If the **Show graph** check box is enabled, a representation of the CPU usage is plotted on the graph. The small colored square to the left shows the color of the line. You can change this color according to your requirements in the options under the **User Interface** navigation entry.
Progress	**Position** continuously indicates the current position of the read head on the disc during the write process. **Elapsed** specifies in minutes and seconds the time elapsed since the write process started.

See also

Create Data Disc (Classic Version) → 18

6 Disc Info

The **Disc Info** tab provides detailed information on the disc inserted in the drive. The information is displayed on the tab in an area divided into: **Basic Information**, **Extended Information**, and **Raw Data**.



Disc Info Tab

You can customize the display to meet your requirements by using the check boxes under the display area. The following check boxes are available:

Basic information	If this check box is enabled, the general information in the **Basic Information** area is displayed. If this box is not checked, this information will be hidden.
Extended Information	If this box is checked, the information in the **Extended Information** area will be displayed. If this box is not checked, this information will be hidden.
Raw data	If this box is checked, the **Raw data** will be displayed. If this box is not checked, this information will be hidden.

Additionally, the following buttons are available under the display area:

Copy Text	Copies all of the information to the clipboard in text format.
Copy HTML	Copies all of the information to the clipboard in HTML format.

You will find general information on the disc in the drive in the **Basic Information** area. The following display panels are available:

Disc type	Shows the disc type of the disc in the drive.
Book type	Shows the book type of the disc in the drive.
Manufacturer	Shows the manufacturer's name.
MID	Show the media identification code (MID). The MID identifies the disc.
Write Speeds	Shows all possible burning speeds for the disc in the drive. This information depends on the firmware of the chosen optical drive, i.e. different recorders can show different options for the same disc.
Capacity	Shows the disc capacity both in MSF (minutes/seconds/frames) and in MB. Additional capacity achieved through overburning is not incorporated into the calculation.

You will find further information on the disc in the drive in the **Extended Information** area. The following display panels are available:

Layers	Shows the number of available layers on the disc.
Write strategies	Checks the intended use of a disc. Some discs have a designated purpose, for example audio CDs, data CD.
Copyright protection	Shows whether or not the disc in the drive is copy-protected.
Disc status	Shows the status of the disc, i.e. whether the disc is still totally blank, already finalized or can accept more data.

You will find information on **binary data** that was previously burned to the disc in the Raw Data area.

7 Disc Quality

7.1 Running the Disc Quality Test

The following requirement must be fulfilled:

► The **Disc Quality** tab is selected in the main screen.

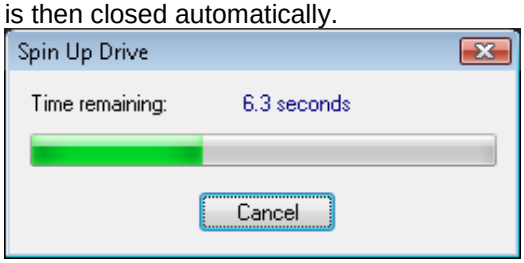
To start the **Disc Quality** test, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert a disc into the optical drive.

If you want to run the detailed test, i.e. test the entire disc, make sure that the **Quick scan** check box is disabled.

3. Configure the settings you want in the **Settings** area, to the right of the graph.
4. Click the **Start** button.

→ The **Spin Up Drive** window is displayed while the test is being prepared. The window is then closed automatically.



→ The test is run. You can follow the test processes in the areas under the graphs. You can cancel the running test at any time by clicking the **Stop** button.

→ You can now see the results of the test in the graphs and the relevant displays and save them. Furthermore, the **Disc Quality Test – Statistics** window is opened and shows the testresults.

See also

Saving Test Data → 47

7.2 Disc Quality Tab

The **Disc Quality** test is often referred to as Scan, and can be run on the **Disc Quality** tab. You can choose between a quick scan and a complete scan. The quick scan only checks defined points on the disc. All other areas are ignored. As a result, it requires less time than a complete scan but is less accurate. This test is particularly useful for burned discs. It can only be run reliably with a recorder; a simple reader is not sufficient.

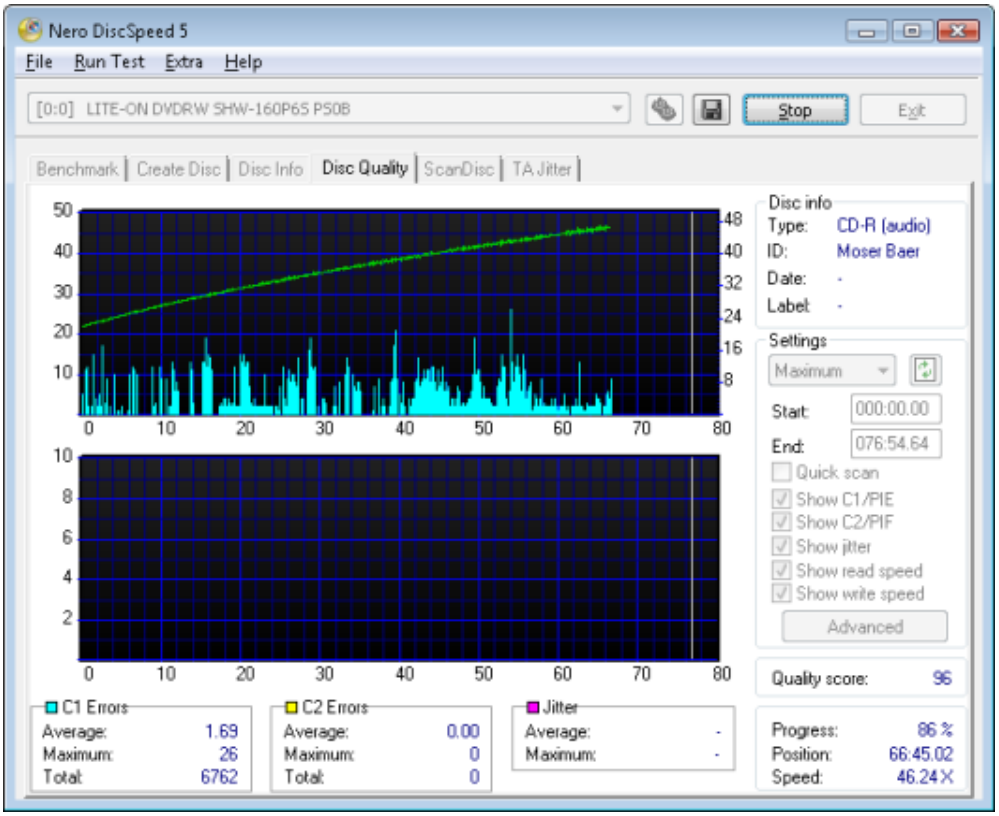
Whether the **Disc Quality** tab is available depends on the recorder that is installed.

The results are displayed in two graphs: the top one shows the results for C1 errors/PI errors (for CD's and DVD's respectively), while the bottom one shows the results for C2 errors/PI failures (for CD's and DVD's respectively). In the top graph, the vertical scales on the left show the number of C1 errors/PI errors and the vertical scales on the right show the write/read speed. In the bottom graph, the vertical scales on the left show the number of C2 errors/PI failures and the vertical scales on the right show the jitter value. The horizontal scale in both graphs shows the disc capacity, in MB for CD's and in GB for DVD's.

If you want to omit a protected area from the bottom graph, enable the **Use background to show error limits** check box in the options under the **Disc Quality** navigation entry.

In addition, both test results and data on the test in progress are shown in the **Disc info** area and in a number of other display panels to the right of the graph. In the **PI errors**, **PI Failures**, and **Jitter** areas under the graph, information on the disc quality is displayed in real-time while the test is run. The number of **PO failures** is also shown here.

If the **Include test data** check box has been enabled in the options under the **Transfer Rate** navigation entry, an additional display panel showing information on the recorder and the firmware used to burn the disc in the drive is shown above the graph.



Disc Quality tab

You can define preferences for the test in the **Settings** area to the right of the graph. In addition, the necessary basic settings in the options under the **Disc Quality** navigation entry must be met.
The following setting options are available on the tab:

Menu **Speed**	Defines the speed at which the test is run. The available entries in the drop-down menu vary depending on the disc in the drive.
Button 	Refreshes the entries in the drop-down menu of available speeds. If there are several drives connected to your computer, we recommend that you refresh the data once you have chosen the optical drive for the test.
Input field **Start**	Defines the start value from which the test should run. This value can be manually entered. Select the value 0000MB to start the test from the beginning of the disc.
Input field **End**	Defines the end value up to which the test should run. This value can be manually entered. Nero DiscSpeed suggests a value for the disc in the drive. For a burned disc, this value may deviate from the maximum capacity, since the data may either not fill up or exceed the maximum capacity.

Check box **Quick Scan**	If this box is checked, the quick scan will be run as per the settings you defined in the options under the **Disc Quality** navigation entry. If this box is not checked, the entire disc will be scanned.
Check box **Show C1/PIE**	If this box is checked, the C1 errors/PI errors will be shown. If this box is not checked, this information will be hidden.
Check box **Show C2/PIF**	If this box is checked, the C2 errors/PI failures will be shown. If this box is not checked, this information will be hidden.
Check box **Show Jitter**	If this box is checked, the jitter will be shown. If this box is not checked, this information will be hidden. Not all recorders can measure jitter values. Even if this box is checked, the jitter will not be shown if the recorder in question cannot measure the values.
Check box **Show read speed**	If this check box is enabled, the read speed is displayed in the top graph. The curve is displayed in red by default. You can change this color according to your requirements in the options under the **Disc quality** navigation entry.
Check box **Show write speed**	If this check box is enabled, the write speed is displayed in the top graph. The curve is displayed in white by default. You can change this color according to your requirements in the options under the **Disc quality** navigation entry. If the **Include test data** check box has been enabled in the options under the **Transfer Rate** navigation entry, the write speed will have been recorded on the disc during the burn process and will be available for further tests on the disc. If this box was not checked during burning, the write speed cannot be displayed as the information will not have been saved on the disc.
Button **Advanced**	Opens the **Disc Quality Test: Advanced Options** dialog box.

The **Disc info** area shows general information on the disc in the drive. The following display panels are available:

Type	Shows the disc type of the disc in the drive.
ID	Shows the media code of the disc.
Date	Shows the date when the disc was created/burned. If an image file was burned to the disc, this display panel shows the date on which the image file was created.

Label	Shows the disc label of the disc in the drive. If you do not want to show the disc label, disable the **Show disc** label box in the options under the **Disc Quality** navigation entry.

There is more information available in the following display panels:

Quality score	A percentage is calculated based on the results of the test. A quality index of 100% is perfect, i.e. there were no errors.
Progress	Shows the progress of the test, i.e. the percentage of the disc already scanned.
Position	Continuously indicates the current position of the read head on the disc.
Speed	Shows the scanning speed.

The **C1 Errors** or **PI Errors** area shows information onC1 or PI errors found. If a CD has been inserted in the optical drive, C1 errors are shown in this area. If a DVD has been inserted in the optical drive, PI errors are displayed in this area.

The following display panels are available:

Average	Shows the average number of C1 or PI errors found.
Maximum	Shows the maximum number of C1 or PI errors.
Total	Shows the total number of C1 or PI errors found.

The **C2 Errors** or **PI Failures** area shows information on C2 errors or PI failures found. If a CD has been inserted in the optical drive, C2 errors are shown in this area. If a DVD has been inserted in the optical drive, PI failures are shown in this area.

The following display panels are available:

Average	Shows the average number of C2 errors or PI failures found.
Maximum	Shows the maximum number of C2 errors or PI failures.
Total	Shows the total number of C2 errors or PI failures found.

The **Jitter** area shows information on the jitter. Not all recorders can measure jitter values. The display panels remain blank if the recorder in question cannot measure the values. The following display panels are available:

Average	Shows the average jitter value.
Maximum	Shows the maximum jitter value.

The number of **PO failures** is shown in the PO Failures display panel. These are the gravest errors that can be found on a DVD. PO failures are normally an indication of there being unreadable data on the disc.

See also

- Disc Quality Entry → 62
- Transfer Rate Navigation Entry → 56

8 ScanDisc

8.1 Running the ScanDisc Test

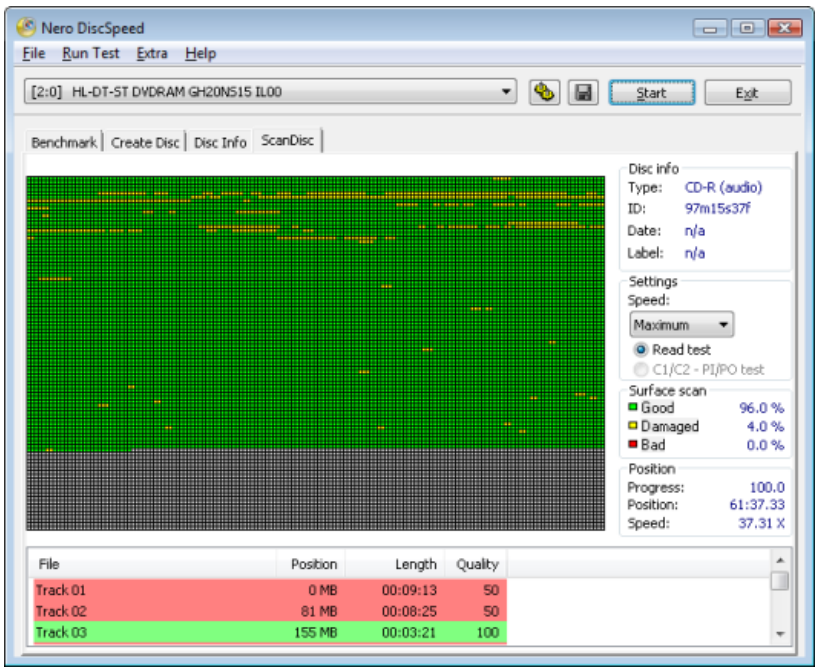
The **ScanDisc** test can be run in two versions: as a read test and as a C1/C2 – PI/PO test.

The following requirement must be fulfilled:

► The **ScanDisc** tab is selected in the main screen.

To start the **ScanDisc** test, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert a disc into the optical drive.
3. Select the speed with which you want to run the test from the **Speed** drop-down menu.
4. If you want to run the test as a read test, select the **Read test** option button.
   If you want to run the test as a C1/C2 - PI/PO test, select the **C1/C2 - PI/PO test** option button.
5. Click the **Start** button.
   → The test is run. You can follow the test processes in the areas under and next to the graph. You can cancel the running test at any time by clicking the **Stop** button.
   → You can now see the results of the test in the graphs and the relevant displays and save them.



See also

Saving Test Data → 47

8.2 ScanDisc Tab

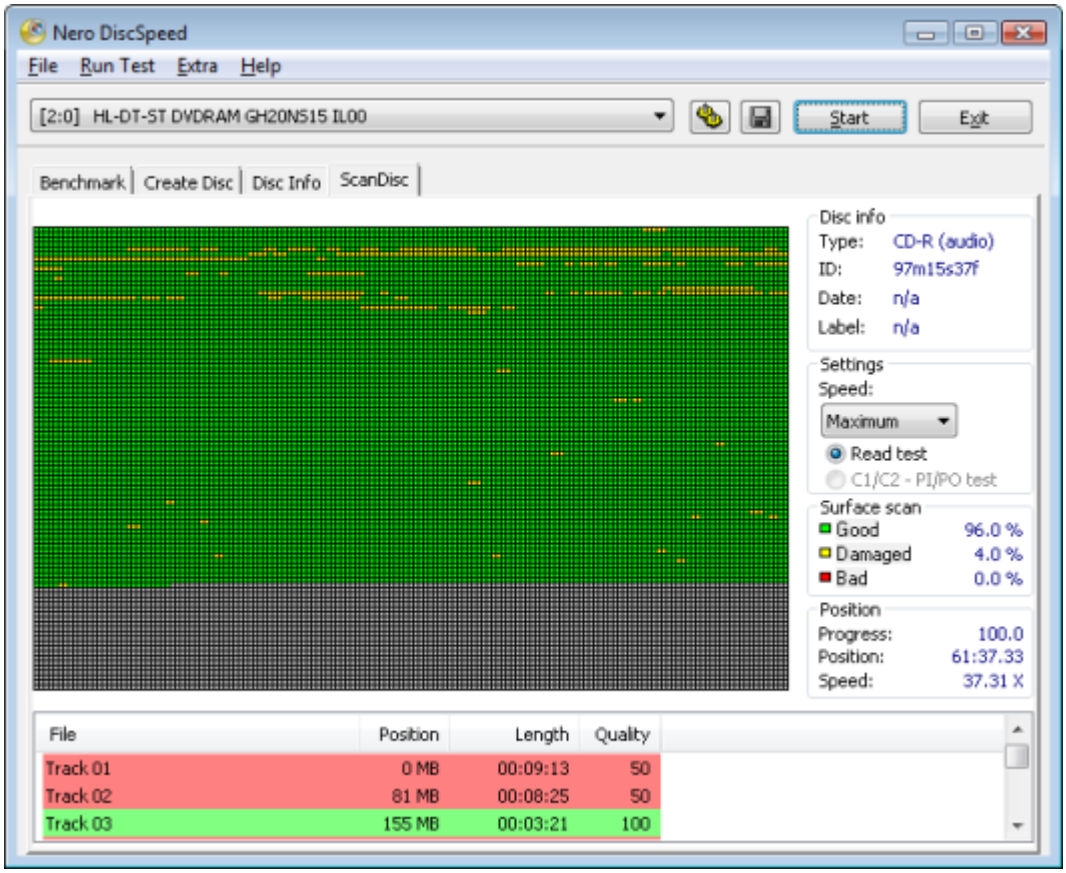
The **Scan Disc** test is available on the **Scan Disc** tab, where the result is also displayed. It can be run in two versions: as a **read test** and as a **C1/C2 – PI/PO test**.

You can use the **Read test** to test optical drives and/or burned discs. The test checks whether burning was successful and whether all areas can be read.

If you want to test burned discs, we recommend that you set the test speed to maximum. You will then be testing the disc under worst-case conditions.

The **C1/C2 - PI/PO test** lets you check the quality of the disc with respect to completeness of the sectors. It must be noted that this test is different from the disc quality test, even if the latter is similar to the **C1/C2 - PI/PO test**. The results from the C1/C2 - PI/PO test are displayed differently in the graph. Instead of the number of errors, the status of the sectors is shown.

The test results of both versions are displayed both in a graph and in detail in the display panel below the graph. In addition, both the test results and data on the test in progress are shown in the **Disc info**, **Surface scan**, and **Position** areas to the right of the graph.



ScanDisc tab

You can define preferences for the test in the **Settings** area to the right of the graph. The following setting options are available:

Menu **Speed**	Defines the speed at which the test is run. The available entries in the drop-down menu vary depending on the disc in the drive.
Option button **Read test**	Enables the **Read test**.
Option button **C1/C2 - PI/PO Test**	Enables the **C1/C2 – PI/PO test**.

The graph shows all sectors on the disc in one chart, with each sector being plotted with a small square. Each square, i.e. each sector, is displayed in a different color depending on its status. The **Surface scan** area shows the respective percentage of sectors in the following three categories: **Good**, **Damaged**, and **Bad** in real time while the test is running. The following colors, i.e. status indicators, are available:

Green	Readable sectors with no errors.
Yellow	Damaged sectors that can still be read using the recorder's internal error correction feature.
Red	Damaged sectors that cannot be corrected and are consequently unreadable.

The **Disc info** area shows general information on the disc in the drive. The following display panels are available:

Type	Shows the disc type of the disc in the drive.
ID	Shows the media code of the disc.
Date	Shows the date when the disc was created/burned. If an image file was burned to the disc, this display panel shows the date on which the image file was created.
Label	Shows the disc label of the disc in the drive. If you do not want to show the disc label, disable the **Show disc** label box in the options under the **Disc Quality** navigation entry.

If the **Include test data** check box has been enabled in the options under the **Transfer Rate** navigation entry, an additional display panel showing information on the recorder and the firmware used to burn the disc in the drive is shown above the graph.

The following display panels are available in the **Position** area while the test is running:

Progress	Shows the progress of the test, i.e. the percentage of the disc already scanned.
Position	Continuously indicates the current position of the read head on the disc.
Speed	Shows the scanning speed.

The following information is available in the columns in the display panel:

File	Lists the names of the files on the disc in the drive.
Position	Shows the respective position of the file on the disc.
Length	Shows the length of the individual files.
Quality	Specifies the quality of the files. This score is calculated from the number of errors found.
PIE	Specifies the number of PI errors found. Only available for the C1/C2 – P1/PO test.
PIF	Specifies the number of PI failures found. Only available for the C1/C2 – P1/PO test.
POE	Specifies the number of PO errors found. Only available for the C1/C2 – P1/PO test.
POF	Specifies the number of PO failures found. Only available for the C1/C2 – P1/PO test.
Jitter	Specifies the jitter values. Only available for the C1/C2 – P1/PO test. Not all recorders can measure jitter values. This column is omitted if the recorder in question cannot measure the values.

See also

Transfer Rate Navigation Entry → 56

9 Additional Test - Advanced DAE Quality

The **Advanced DAE Quality Test** is different from the standard **DAE Quality** test. With a special test disc, the advanced test identifies problems that your optical drive may have when reading an Audio CD.

You can run the test in two steps, depending on whether you first want to create a test CD and then test it or you already have a suitable test disc with which you can start the test directly.

In addition, the **Error test** lets you determine the capabilities of an optical drive to prevent errors when creating a copy.

See also

Creating a Test Disc → 35

Running the Advanced DAE Quality Test → 37

9.1 Creating a Test Disc

To create a test disc, proceed as follows:

1. Insert an empty CD into the recorder.
2. Click **Extra** > **Advanced DAE Quality Test** > **Create Test CD**.
   → The **Nero DiscSpeed DAE Test Disc** window opens.
3. Make the settings you want in the top part of the window.
4. Click the **Start** button.
   → The burn process starts. You can monitor the progress of the burn process in the **Write position** and **Disc information** areas, as well as in the display area underneath.
   → You have created a test disc and can now use it to run the advanced DAE quality test.

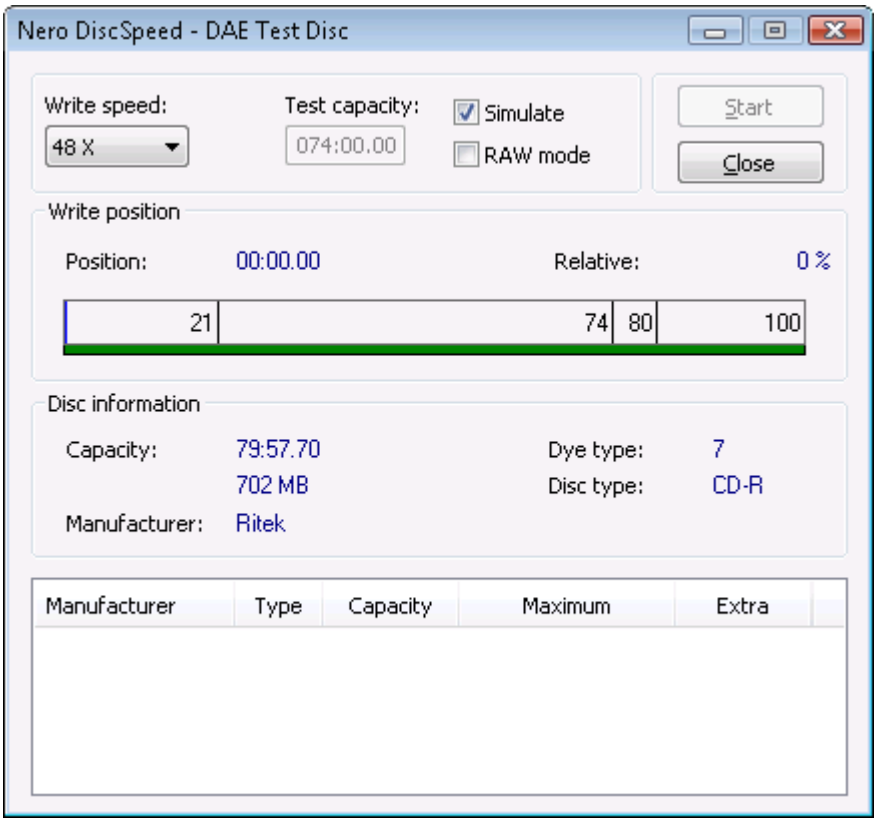
See also

Running the Advanced DAE Quality Test → 37

9.2 DAE Test Disc Window

You can create a test disc in the **Nero DiscSpeed - DAE Test Disc** window.

You can define preferences for the burn process in the top area of the window. Information on the write process in progress and on the disc in the drive is displayed in the **Write position** and **Disc information** areas as well as in the display area at the bottom of the window.



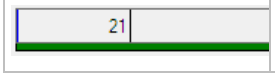
Nero DiscSpeed Window - DAE Test Disc

The following setting options are available:

Menu **Write speed**	Defines the speed at which the disc is burned. We recommend that you choose a speed of 16x or less when burning an audio CD.
Input field **Test capacity**	Shows the disc capacity in MSF (minutes/seconds/frames).
Check box **Simulate**	If this check box is selected, Nero DiscSpeed simulates the burn process rather than writing data to the recordable disc. This check box is selected by default.
Check box **RAW mode**	If this box is checked, the disc will be burned in RAW mode.

The following information on the write process in progress is displayed in the **Write position** area:

Position	Continuously indicates the current position of the read head on the disc.

Relative	Always indicates the percentage of the disc that has already been written.
	Indicates the burn progress.

The following information on the disc in the drive is displayed in the **Disc information** area and in the display area:

Capacity	Shows the disc capacity both in MSF (minutes/seconds/frames) and in MB. **Maximum** specifies the maximum volume of data that can be written to the disc with the help of additional capacity achieved through overburning. **Extra** - Shows the difference between normal capacity and maximum capacity.
Manufacturer	Shows the manufacturer's name.
Dye type	Shows the dye type used.
Disc type	Shows the disc type of the disc in the drive.

9.3 Running the Advanced DAE Quality Test

The following requirement must be fulfilled:

► You have already created a test disc.

To run the test, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert the special test disc that you previously created into the optical drive.
3. Click **Extra** > **Advanced DAE Quality Test** > **Run Test** on the menu bar.
   → The **Nero DiscSpeed - Advanced DAE Quality Test** window opens.
4. Make the settings you want in the **Advanced features** area.
5. Click the **Start** button.
   → The test is run. You can cancel a running test at any time by clicking the **Stop** button.
   → You can now see the results of the test in the **Test results** and **On-the-fly copying** areas, as well as their detailed information in the display area, and save them.

See also

Saving Test Data → 47
Creating a Test Disc → 35

9.4 Nero DiscSpeed window - Advanced DAE Quality Test

In the **Nero DiscSpeed - Advanced DAE Quality Test** window, you can run the advanced DAE quality test, and the result is also shown there.

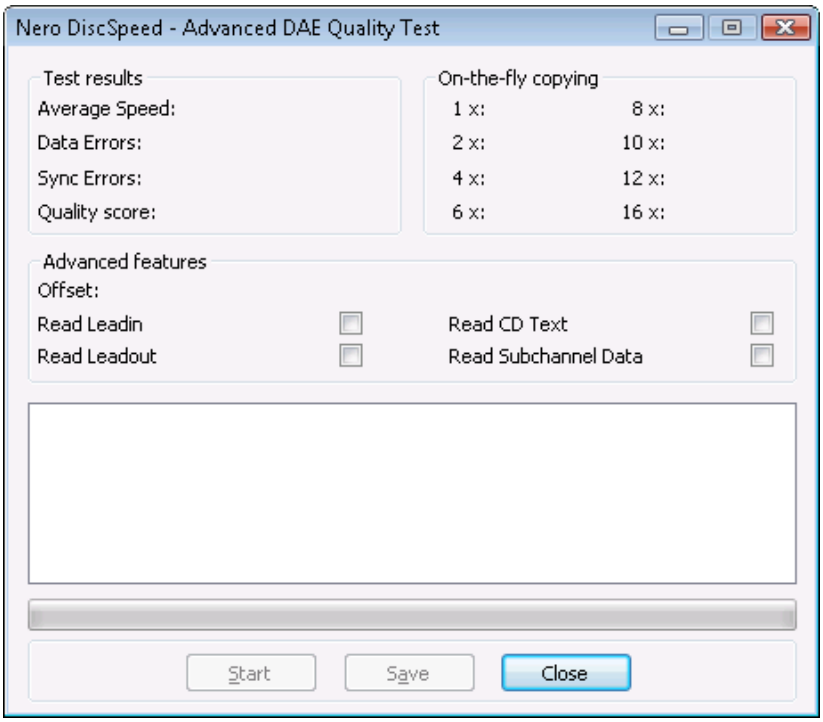
The results are displayed in the **Test results** and **On-the-fly copying** areas, as well as in detail in the display area. A progress bar at the bottom of the window indicates the status of the test while it is running.

In the **On-the-fly copying area**, the test determines whether an audio CD can be copied without causing errors at various speeds between 1x and 16x, i.e. indicates if the optical drive is suitable for use on-the-fly in combination with a recorder for backing up audio discs.

The results of two tests are displayed in the **Test results** area: the **Sequential read test** and the **Random read test**. The sequential read test simulates the digital extraction of audio files (DAE) under ideal conditions and then runs a harmonic read test. This test helps you to identify errors on the disc. There are two different types of error.

A search for data errors returns audio samples that were not read correctly, based on a comparison of the read bytes with the known data from the test disc. Minor data errors can be corrected using the drive's error correction feature. The most common cause of data errors is poor-quality discs. Avoid data errors by using high-quality discs and/or reducing the drive speed.

Synchronization errors occur when, instead of reading the required audio sectors, an optical drive reads the adjacent sectors. Nero DiscSpeed uses special data on the test disc to check if the correct sectors are being read. Synchronization errors can result in samples being lost or repeated. These errors can be audible.



Nero DiscSpeed window - Advanced DAE Quality Test

You can define preferences for the optical drive test in the **Advanced features** area. Optical drives start from different positions when reading audio sectors. There is also no standardized start position for the write process of recorders - there is usually a gap of a few hundred samples. The following check boxes are available:

Read Leadin	If this check box is enabled, the capability of the optical drive of reading the leadin is tested. To create perfect copies, an optical drive should begin reading data before the actual start position.
Read Leadout	If this check box is enabled, the capability of the optical drive of reading the leadout is tested. To create perfect copies, an optical drive should read data from the leadout.
Read CD Text	If this check box is enabled, the capability of the drive of reproducing CD Text is tested.
Read Subchannel Data	If this check box is enabled, the subchannel data is read during the test. Subchannel data contains information such as index markers. An optical drive must be able to reproduce this data if it is to create perfect audio copies.

The following information is available in the **Test results** area:

Average Speed	Calculates and shows the average speed of the completed test.
Data Errors	Lists the data errors found.
Sync Errors	Shows the number of synchronization errors found. Synchronization errors occur when data is correct but has been moved by one or more sectors.
Quality score	A percentage is calculated based on the results of the test. A quality index of 100% is perfect, i.e. there were no errors.

9.5 Error Test

The **Error test** determines the capability of a optical drive to prevent errors when creating a copy. The test is run in two steps: The **Create Image** feature first creates an image file of your test disc and saves it on the hard drive. After this, the **Run Test** feature reads the data on your test disc in order to compare it with the image file.

To run this test you need a standard test disc of the type **A-BEX** (**TCD-714R**, **TCD-721R**, or **TCD-726**). All A-BEX discs contain the same data (audio data). The reading surface of the various A-BEX discs contains a series of intentional defects of varying severity.

Instead of using an A-BEX disc, you can also run a limited version of the test by using a DAE test disc that you have previously created. It is not necessary to create an image file in this case, since Nero DiscSpeed is familiar with the contents of the comparison disc.

See also

Creating a Test Disc → 35
Create Image → 40

9.5.1 Create Image

The **Create Image** feature lets you extract data from an A-BEX disc in order to create an error-free image file on the hard drive - provided the optical drive can create the file from the data provided.

To create an image file of the test disc, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert an A-BEX disc in the optical drive.
3. Click **Extra** > **Advanced DAE-Quality Test** > **Error Tests** > **Create Image**.
   → The **Nero DiscSpeed - Advanced DAE - Create Image** window opens.
4. Click the **Start** button.
   → The image file of the test disc is created. You can follow the progress of the write process with the progress bar, and can cancel the process at any time by clicking the **Stop** button.
   → A dialog box opens that informs you whether the image file has been successfully created. You have created an image file of the test disc and can now use it to proceed with the second part of the error test, **Run Test**.

See also

Running the Test with an A-BEX Test Disc → 40

9.5.2 Running the Test with an A-BEX Test Disc

The **Run Test** feature reads the data on an A-BEX disc and compares it to an image file of the same disc. This test ensures that the copy created is perfect.

The following requirement must be fulfilled:

► The image file of the test disc must be saved on the hard drive.

To compare the test disc to the associated image file on the hard drive, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert an A-BEX disc whose image file is already on the hard drive into the optical drive.
3. Click **Extra** > **Advanced DAE Quality Test** > **Error Test** > **Run Test**.

→ The **Nero DiscSpeed - Advanced DAE Error Correction Test** window opens.

4. Some optical drives show C2 errors in reverse order. If you want to correct this, enable the **Reverse C2** check box.
5. Click the **Start** button.
   → The test is run. The graphs and the areas underneath indicate the progress. You can cancel a running test at any time by clicking the **Stop** button.
   → You can now see the results of the test in the graphs and the relevant displays and save them.

See also

- Saving Test Data → 47
- Create Image → 40

9.5.3 Running the Test with a DAE Test Disc

Instead of using an A-BEX disc, you can also run a limited version of the **Error test** by using a DAE test disc that you have previously created. In this case it is not necessary to create an image file, since Nero DiscSpeed already knows the content of the comparison disc.

To run the test, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert a DAE disc in the optical drive.
3. Click **Extra** > **Advanced DAE Quality Test** > **Run Test**.
   → The **Nero DiscSpeed - Advanced DAE Error Correction Test** window opens.
4. Some optical drives show C2 errors in reverse order. If you want to correct this, enable the **Reverse C2** check box.
5. Click the **Start** button.
   → The test is run. You can cancel a running test at any time by clicking the **Stop** button.
   → You can now see the results of the test in the graphs and the relevant displays and save them.

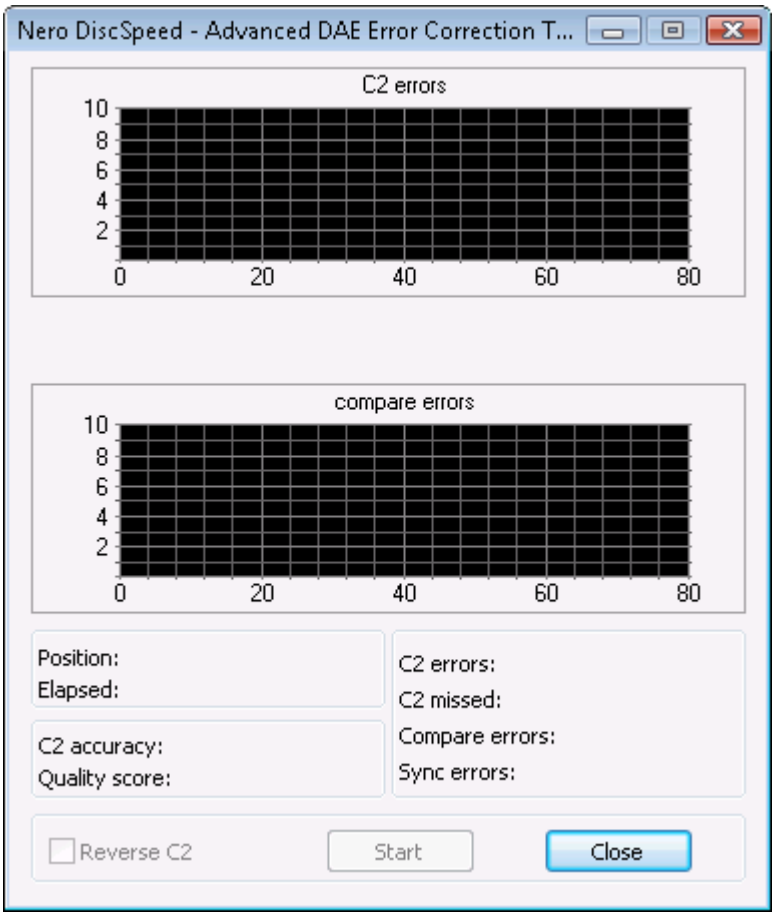
See also

- Saving Test Data → 47
- Creating a Test Disc → 35

9.5.4 Advanced DAE Error Correction Test Window

The **Error test** is run in the **Nero DiscSpeed - Advanced DAE Error Correction Test** window.

The results are displayed in the **C2 errors** and **Compare errors** graphs, as well as in the display areas underneath, while the test is still in progress. The top graph shows C2 errors found on the disc. The bottom graph compares the errors found when Nero DiscSpeed compares the data on the disc with the data from the image file.



Nero DiscSpeed window- Advanced DAE Error Correction Test

The following fields are available in the areas below the graphs:

Position	Continuously indicates the current position of the read head on the disc over the course of the write process.
Elapsed	Specifies in minutes and seconds the time elapsed since the write process started.
C2 accuracy	The C2 accuracy of the optical drive is determined based on the results of the test.

Quality score	A percentage is calculated based on the results of the test. A quality index of 100% is perfect, i.e. there were no errors.
C2 errors	Shows the number of C2 errors found.
C2 missed	Shows the number of C2 errors missed.
Compare errors	Shows the number of compare errors found. Compare errors occur when the audio data read out does not match the compare data from the image file.
Sync Errors	Shows the number of synchronization errors found. Synchronization errors occur when data is correct but has been moved by one or more sectors.

10 Additional Test - Overburning

Not all recorders support overburning.

Note that overburning can damage an optical drive. To prevent damage to the optical drive, you should only use this feature with suitable discs.

Note that a disc whose leadout has been written to no longer conforms to the standard specification for CDs, and therefore may not be detected by some readers.

Overburning is the process of writing data past the official capacity of the disc in the CD's leadout area. The actual purpose of the leadout area is to define where the disc ends. By filling part of the leadout with data instead of zeros it is possible to increase the disc's capacity. Usually it is possible to overwrite the 90 seconds of the leadout without any difficulty. Nonetheless there is a high probability that the data will become unreadable since the area was originally intended for storing only zeros and is at the outer edge of the disc. This part of the disc is more likely to become damaged or soiled.

Overburning is also possible, although not advisable, with DVD's. The outer edge of DVD's is more susceptible to errors. Furthermore only a small number of DVD recorders support this feature.

The **Overburning Test** feature lets you run a simulation of the overburn process and test whether or not the recorder is suitable for this process. Nero DiscSpeed also checks how much data can be written to the disc being used.

If you want to test the overburn capability of a disc and your recorder in a real burn process, enable the **Overburn CD** or **Overburn DVD** (depending on the **disc type**) check box under the **Transfer Rate** navigation entry, in the Nero DiscSpeed – Options window.

After this, start the **Create data disc** standard test.

See also

Transfer Rate Navigation Entry → 56
Create Data Disc (Classic Version) → 18

10.1 Running the Overburning Test

To run the overburning test as a simulation, proceed as follows:

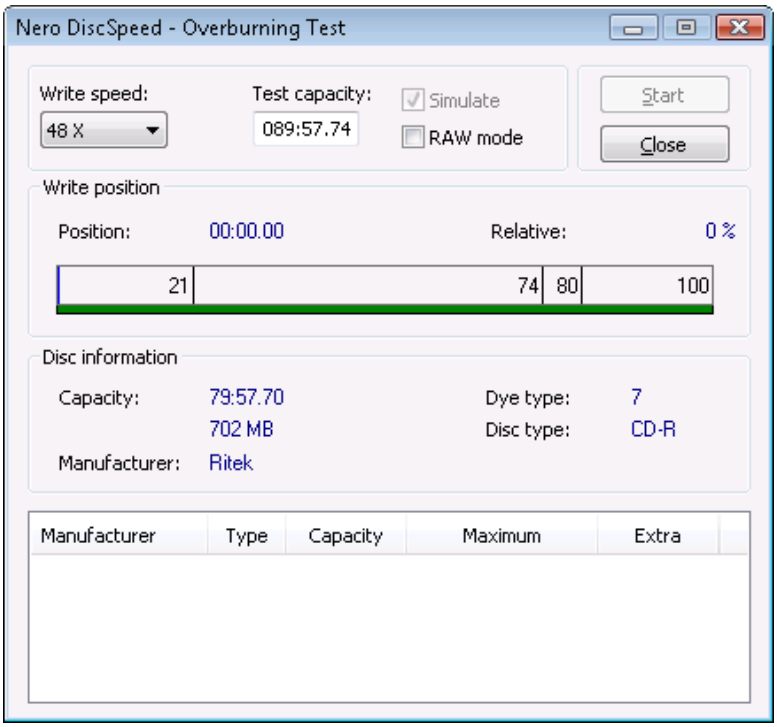
1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert a blank disc in the optical drive.
3. Click **Extra** > **Overburning Test**.
   → The **Nero DiscSpeed - Overburning Test** window opens.

4. If you want to simulate the burn process in RAW mode, enable the **RAW mode** check box.
5. Choose the volume of data that you want to write to the disc or let Nero DiscSpeed determine the official capacity.
6. Click the **Start** button.
   - → The simulation is started. You can follow the progress of the burn process in the **Write position** and **Disc information** areas, as well as in the display area underneath. You can cancel a running test at any time by clicking the **Stop** button.
   - → A dialog box specifying the maximum detected capacity opens.
7. If you want to add the detected value to the internal overburning database, click the **Yes** button.
   - → If a disc of the same type is inserted again, Nero DiscSpeed will detect it in this way, and the results stored in the database can be displayed in the display area.
8. If you want to discard the detected value, click the **No** button.
   - → You have run the overburning test.

10.2 Nero DiscSpeed - Overburning Test window

The overburn process simulation is run in the **Nero DiscSpeed - Overburning Test** window.

The results are displayed in the same window, in the **Write position** and **Disc information** areas, as well as in the display area at the bottom of the window.

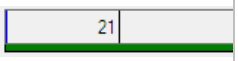


Nero DiscSpeed - Overburning Test window

You can define preferences for the test in the top section of the window. The following setting options are available:

Menu **Write speed**	Defines the speed at which burning of the disc is simulated. We recommend that you choose a speed of 16x or less when burning an audio CD.
Input field **Test capacity**	Shows the disc capacity in MSF (minutes/seconds/frames).
Check box **Simulate**	If this check box is selected, Nero DiscSpeed simulates the burn process rather than writing data to the recordable disc. This check box is selected by default.
Check box **RAW mode**	If this box is checked, the burn process will be simulated in RAW mode.

The following information on the burn process simulation in progress is displayed in the **Write position** area:

Position	Continuously indicates the current position of the read head on the disc.
Relative	Always indicates the percentage of the disc that has already been written.
	Shows the progress of the simulated burn process: **Green** – Data written within the disc's normal capacity. **Yellow** – Data written past the disc's normal capacity. **Dark green** – Buffer status. **Blue** – Standard, official disc capacity. **Red** – Current position of the read head on the disc.

The following information on the disc that is inserted in the drive is displayed in the **Disc information** area and in the display area

Capacity	Shows the disc capacity both in MSF (minutes/seconds/frames) and in MB. **Maximum** specifies the maximum volume of data that can be written to the disc with the help of additional capacity achieved through overburning. **Extra** - Shows the difference between normal capacity and maximum capacity.
Manufacturer	Shows the manufacturer's name.
Dye type	Shows the dye type used.
Disc type	Shows the disc type of the disc in the drive.

11 Save and Load Test Data

11.1 Saving Test Data

The **Save Results** menu item lets you save the full set of results from a test on the hard drive.

Nero DiscSpeed offers different storage formats:

Only test data saved as binary files with the ***.dat** extension can be loaded again. Use this format if you want to open the test data in Nero DiscSpeed and/or open and compare the test data in the Nero DiscSpeed database.

An ***.html** file that you can open with any Web browser saves the results as a graph. In the **Options** window, under the **Save** navigation entry, you can define how much data will be saved in the file. If the **Include status** check box is enabled, the diagram and all other test results are saved; if it is cleared, only the graph is saved.

A ***.csv** file saves the test results in a pure text file that you can open with any text editor.

The following requirements have to be fulfilled:

- ► The test you want has already been run.
- ► The results are displayed on the corresponding tab in the main screen.

To save the test results, proceed as follows:

1. Click **File** > **Save Results** and choose your preferred storage format.
   → The **Save As** window appears.
2. Enter a file name in the **File name** input field if necessary.
3. Click the **Save** button.
   → You have saved the test file.

See also

Save Navigation Entry → 59
Loading Test Data → 47

11.2 Loading Test Data

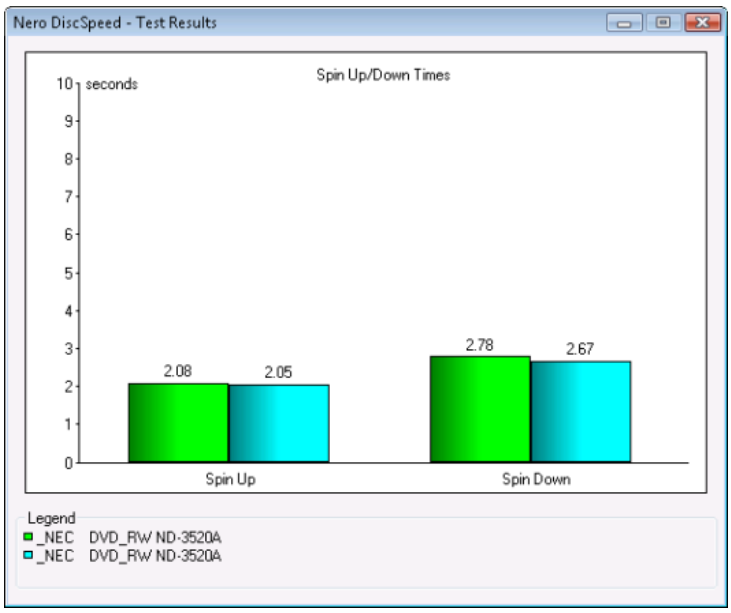
The **Load Single File** menu item lets you load saved test data, while the **Database** menu item lets you load several files at once in order to compare test results and/or the efficiency of optical drives.

Only test data saved as binary files with the *.dat extension can be loaded again.

In order to make effective use of the database, i.e. to get comparable results, you should use the same disc for the different tests in all optical drives.

To load test results, proceed as follows:

1. If you want to open a single saved test file:
   1. Click **File** > **Load Results** > **Load Single File**.
      → The **Open** window appears.
   2. Select the file you want and click the **Open** button.
      → The chosen file is opened in the main screen on the **Benchmark** tab and the test data is displayed.
2. If you want to load several files at once for comparison:
   1. Click **File** > **Load Results** > **Database** in the menu bar.
      → The **Nero DiscSpeed - Database** window opens.
   2. Click the **Add Results** button.
      → The **Insert Files** dialog box opens.
   3. Select the files you want and click the **Open** button.
      → The test files are imported and displayed in the **Nero DiscSpeed – Database** window.
   4. Check the boxes beside the files you want to compare.
   5. In the lower part of the window, select the option button for the test type for which you want to compare data.
      → The results of the chosen test are displayed for the chosen test files.
   6. Click the **Graph** button.
      → The **Nero DiscSpeed Test Results** window is opened and shows a graph of the selected test results. The results for each test file are displayed in a different color (the **Legend** area shows which graph corresponds to which test).



Nero DiscSpeed - Test Results window

➔ You have loaded your chosen test results.

12 Erasing a Disc

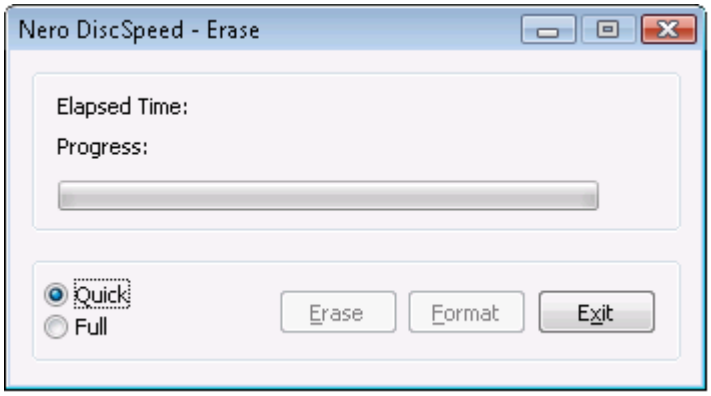
The **Erase Disc** feature lets you erase data from rewritable discs. This operation is run in the **Nero DiscSpeed - Erase** window. As a general rule, there are two erase methods available:

Quick erasing does not remove the data physically from the disc, but instead only makes it inaccessible by erasing the references to existing content. The data can be restored!

Full erasing removes the data from the disc by overwriting it with zeroes. The contents cannot be restored with conventional methods. Repeated full erasing increases the probability that third parties will not be able to reconstruct the contents.

To erase a rewritable disc, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Insert the disc that you want to erase into the optical drive.
3. Click **Extra** > **Erase Disc**.
   → The **Nero DiscSpeed - Erase** window opens.



Nero DiscSpeed - Erase window

4. Select the option button for the erase method you want.
5. Click the **Erase** button.
   → The erase procedure starts. You can cancel the erase process in progress at any time by clicking the **Exit** button.
   → You can track the progress of the erase process with the progress bar.

13 Bit Setting

The **Bitsetting** feature lets you change the bit settings or **Book type** of a selected DVD recorder in the **Nero DiscSpeed - Bit Setting** window (provided the recorder in question supports this feature).

The book type information is what an optical drive uses to detect the inserted disc type. By changing the book type, you can fool the player into believing that the inserted DVD is a pressed disc and not a burned disc.

Not all DVD recorders can modify the book type. What's more, the book type can only be changed for "plus" media (e.g. +R). With other media types, the book type is already on the disc before the burn process.

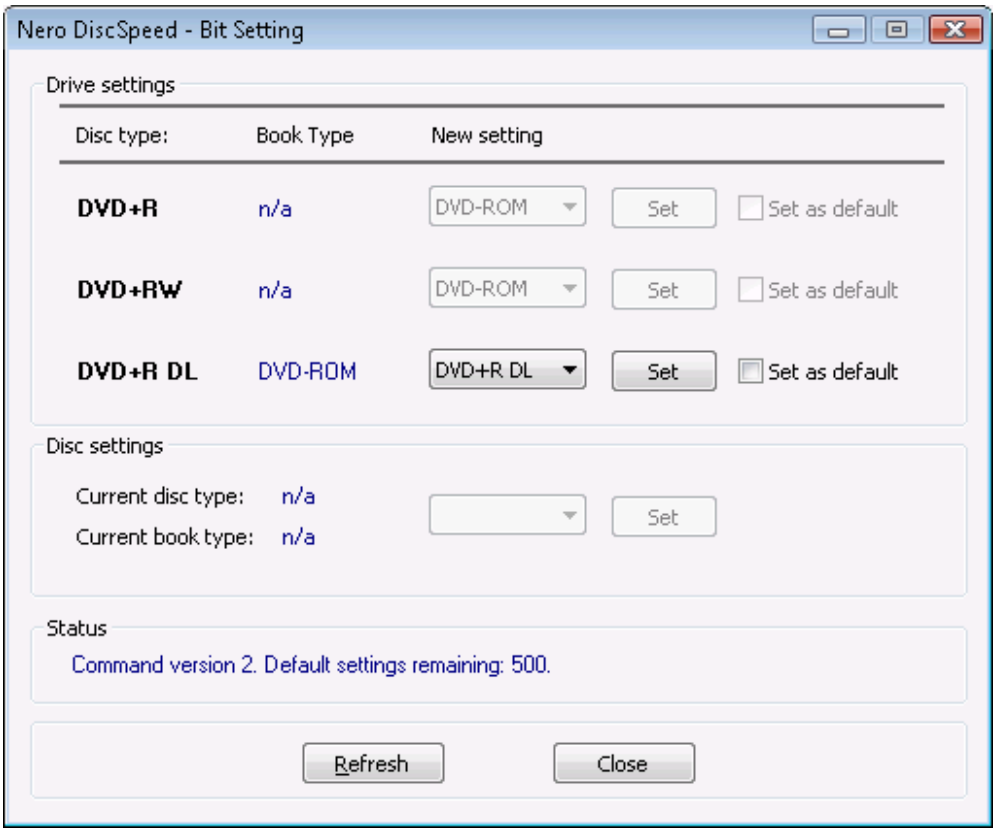
13.1 Changing the Bit Setting

To edit the bit settings for a DVD recorder, proceed as follows:

1. If there are several optical drives available, select the one you want in the drop-down menu.
2. Click **Extra** > **Bitsetting**.
   → The **Nero DiscSpeed - Bit Setting** window opens. The **Drive settings** area shows the disc types, as well as the respective book types.
3. Change a book type in the corresponding **New setting** drop-down menu and click the **Set** button.
4. If you want to retain the modified book type setting as the default setting for the optical drive, enable the **Set as default** check box.
5. Click the **Refresh** button.
   → The display in the window will be refreshed. The **Drive settings** area shows the disc types and the modified book types as a selection under **Book Type**.
6. Click the **Close** button.
   → You have changed the bit settings for a DVD recorder.

13.2 Nero DiscSpeed - Bit Setting Window

Bit settings and book type modifications are carried out in the **Nero DiscSpeed - Bit Setting** window.



Nero DiscSpeed - Bit Setting window

The **Drive settings** area shows the defined book type, as well as all the changes that can be made. The following information is displayed:

Disc type	Shows the disc type of the disc in the drive.
Book type	Shows the book type of the disc in the drive.

The following setting options are available:

Menu **New setting**	Shows which new settings can be selected for the book type. Media types not supported by the chosen optical drive are grayed out.
Button **Set**	Accepts the changes made.
Check box **Set as default**	If this check box is enabled, the chosen changes will be retained as the default settings for the optical drive even after the computer is restarted. This check box will be grayed out if the optical drive does not support this feature.

The **Disc settings** area shows the disc type currently selected and the selected book type.

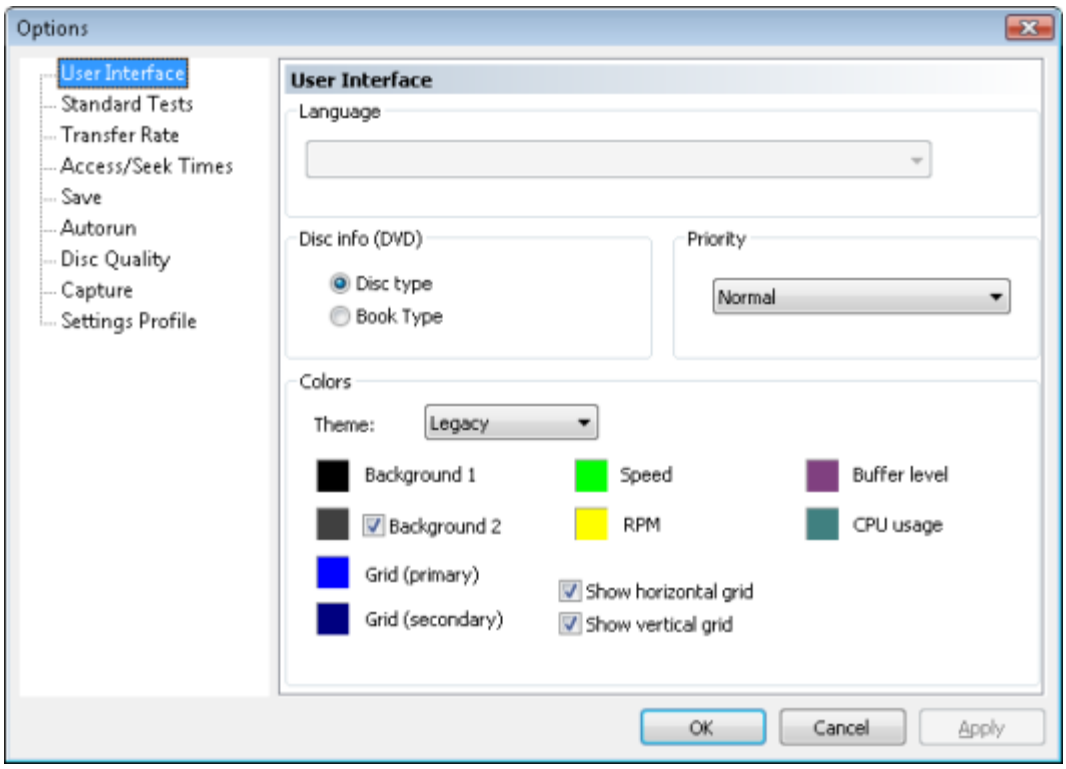
14 Nero DiscSpeed Options Window

The **Nero DiscSpeed - Options** window provides various options for customizing the appearance of the Nero DiscSpeed interface and for configuring settings according to your requirements.

The window can be opened using the  button. It comprises a navigation tree and various setting options. Different input areas will be displayed depending on the entry selected in the navigation tree.

14.1 User Interface Navigation Entry

The **User Interface** navigation entry offers setting options in the **Language**, **Disc info (DVD)**, **Priority**, and **Colors** areas.



Nero DiscSpeed - Options - User Interface navigation entry

The following setting options are available in the **Language** area:

Menu **Language**	Specifies the language to be used in the program interface.

In the **Disc info (DVD)** area, you can select which information is displayed on the **Benchmark** tab on the main screen. This setting will only be available if there is a DVD in the optical drive. The following setting options are available:

Option button **Disc type**	Shows the Disc type of the DVD.
Option button **Book Type**	Shows the book type of the DVD.

The following setting options are available in the **Priority** area:

Menu **Priority**	Selects the priority of Nero DiscSpeed. Each process in Windows is run with a defined priority. This priority defines how efficiently Nero DiscSpeed can access the computer's resources, e.g. memory. The following priority levels are available for selection: **Low**, **Normal**, **High**, and **Realtime**. Set the priority to **High** to prevent your tests from being interfered with by other processes running concurrently on the computer.

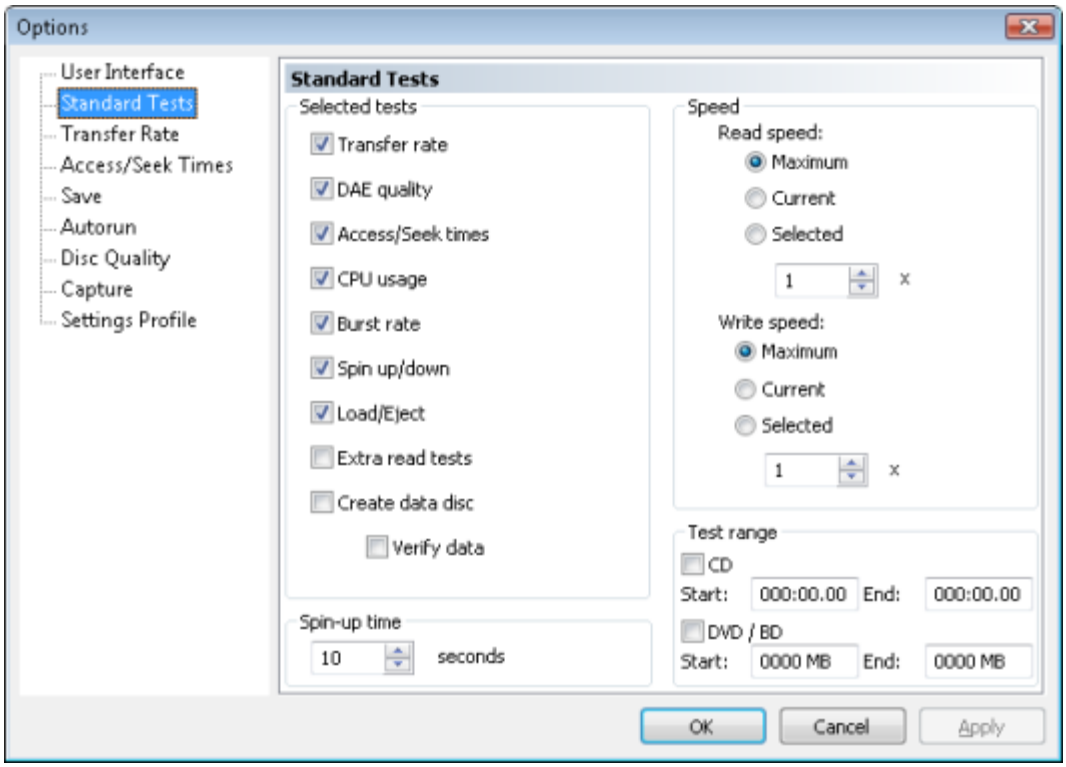
In the **Colors** area, you can define the colors for the **Benchmark** tab in the main screen. The following setting options are available:

Menu **Theme**	Selects the desired theme. In addition to predefined themes, you can also set colors with the **costum** entry. To manually edit a color, click the colored tile and select the color you want in the dialog box that appears.
Button **Background 1**	Changes the basic color in the background of the graph area.
Button **Background 2**	Changes the basic color for shading in the background of the graph area. Only works when the **Background 2** check box is enabled. Otherwise, the background of the graph area is displayed in one single color.
Button **Grid (primary)**	Changes the colors for the coarse grid in the graph area. Only works when at least one of the following check boxes is enabled: **Show horizontal grid** and/or **Show vertical grid**.
Button **Grid (secondary)**	Changes the color for the fine grid in the graph area. Only works when at least one of the following check boxes is enabled: **Show horizontal grid** and/or **Show vertical grid**.
Button **Speed**	Changes the color for the graph curve that represents speed (write or read speed, depending on the test).

Button **RPM**	Changes the color for the graph curve that represents the rotational speed of the disc.
Button **Buffer level**	Changes the color for the Buffer level curve.
Button **CPU usage**	Changes the color for the CPU usage curve.
Check box **Show horizontal grid**	Shows the horizontal grid lines in the graph area or hides them. This box is checked by default.
Check box **Show vertical grid**	Shows the vertical grid lines in the graph area or hides them. This box is checked by default.

14.2 Standard Tests Navigation Entry

The **Standard Tests** navigation entry offers setting options in the **Selected tests**, **Speed**, and **Spin-up time** areas.



Nero DiscSpeed - Options - Standard Tests navigation entry

In the **Selected tests** area, you can define the standard tests that are run automatically if you click the **Start** button on the main screen or the menu item **Run Test** > **Selected**. These tests are run on the **Benchmark** tab. All tests are activated by default.

The following setting options are available:

Check box **Transfer rate**	Adds the test to the standard test series. The **Transfer rate** test measures the read speed of data, i.e. the speed at which data is read from a disc. If the disc inserted is blank, the test measures the write speed.
Check box **DAE quality**	Adds the test to the standard test series. The DAE quality test comprises two partial measurements.
Check box **Access/Seek Times**	Adds the test to the standard test series. The **Access/seek times** test measures the access or seek times of optical drives for discs inserted in the drive in three partial measurements.
Check box **CPU usage**	Adds the test to the standard test series. The **CPU usage** test measures the percentage utilization of the CPU (central processing unit) at various speeds (**1x**, **2x**, **4x**, and **8x**).
Check box **Burst Rate**	Adds the test to the standard test series. The **Burst rate** test measures the maximum possible transmission rate from the optical drive to the computer.
Check box **Spin up/down**	Adds the test to the standard test series. The **Spin down** test measures how long it takes an optical drive to stop, while the **Spin up** test measures how long it takes before the optical drive can read data again after stopping.
Check box **Load/Eject**	Adds the test to the standard test series. The **Load/eject** test measures the time that an optical drive needs to load, detect, and eject a disc.
Check box **Extra read tests**	Adds the test to the standard test series. The **Extra read tests** test series consists of three tests. One or more sectors on the disc are read with defined test samples.
Check box **Create data disc**	Adds the test to the standard test series. The **Create data disc** test is available in its classic version on the **Benchmark** tab and as an advanced version on the **Create Disc** tab. You can use the classic test to analyze the write speed and the rotational speed. You can use the advanced test to also measure the buffer level and the CPU usage caused by the optical drive.

Check box **Verify data**	Checks the data that was written on the disc during the **Create data disc** test.

In the **Speed** area, you can define the **read speed** for the Transfer rate test and the **write speed** for the Create data disc test. Maximum speed is enabled by default; this speed is also recommended for testing the optical drive and/or the discs under worst-case conditions. The following setting options are available:

Option button **Maximum**	Selects the maximum speed that an optical drive can achieve.
Option button **Current**	Selects the current speed of the optical drive. This speed is not influenced, and can be affected by other system settings, e.g. other software or the firmware settings.
Option button **Selected**	Selects the speed manually. Enter the desired value in the input field.

The following setting option is available in the **Spin-up time** area:

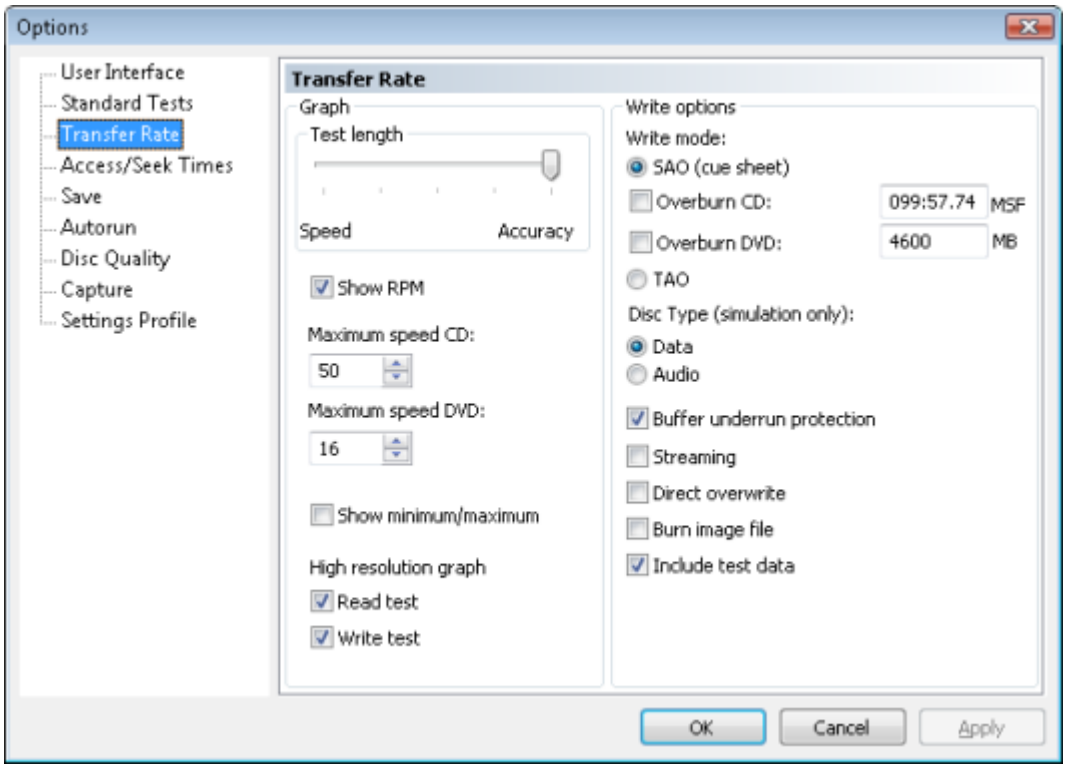
Spin-up time	Defines the spin-up time. In order to stabilize the disc and the optical drive, Nero DiscSpeed starts spinning the disc before the actual test starts. The default setting here is 10 seconds.

See also

- Transfer rate → 14
- DAE Quality → 16
- Access/Seek Times → 16
- CPU Usage → 17
- Burst Rate → 17
- Spin Up/Down → 17
- Load/Eject → 17

14.3 Transfer Rate Navigation Entry

The **Transfer Rate** navigation entry offers setting options in the **Graph** and **Write options** areas specifically for the **Transfer rate** test.



Nero DiscSpeed - Options - Transfer Rate navigation entry

You can define the settings for the graph in the **Graph** area. The following setting options are available:

Slider **Test length**	Defines the accuracy of the transfer rate test. The higher the accuracy, the more detailed the graph is. However, higher accuracy results in a longer test duration.
Check box **Show RPM**	Shows the rotational speed in the graph.
Menu **Maximum speed CD/DVD**	Defines the maximum value shown on the vertical scale of the graph on the **Create Disc** tab if a CD/DVD is inserted into the optical drive. To prevent parts of the curve from extending past the edge of the graph area, we recommend that you choose a value slightly above the maximum read speed of the optical drive.
Check box **Show minimum/maximum**	Shows the minimum and maximum speed values recorded during the transfer rate test. In a normal curve, the lowest speed is the start speed while the highest speed is the end speed. In an uneven curve, the lowest recorded speed is displayed as the minimum value while the highest recorded speed is displayed as the maximum value.

Check box **Read test**	Shows the read test curve in either high or low resolution.
Check box **Write test**	Shows the write test curve in either high or low resolution.

The following setting options are available in the **Write options** area:

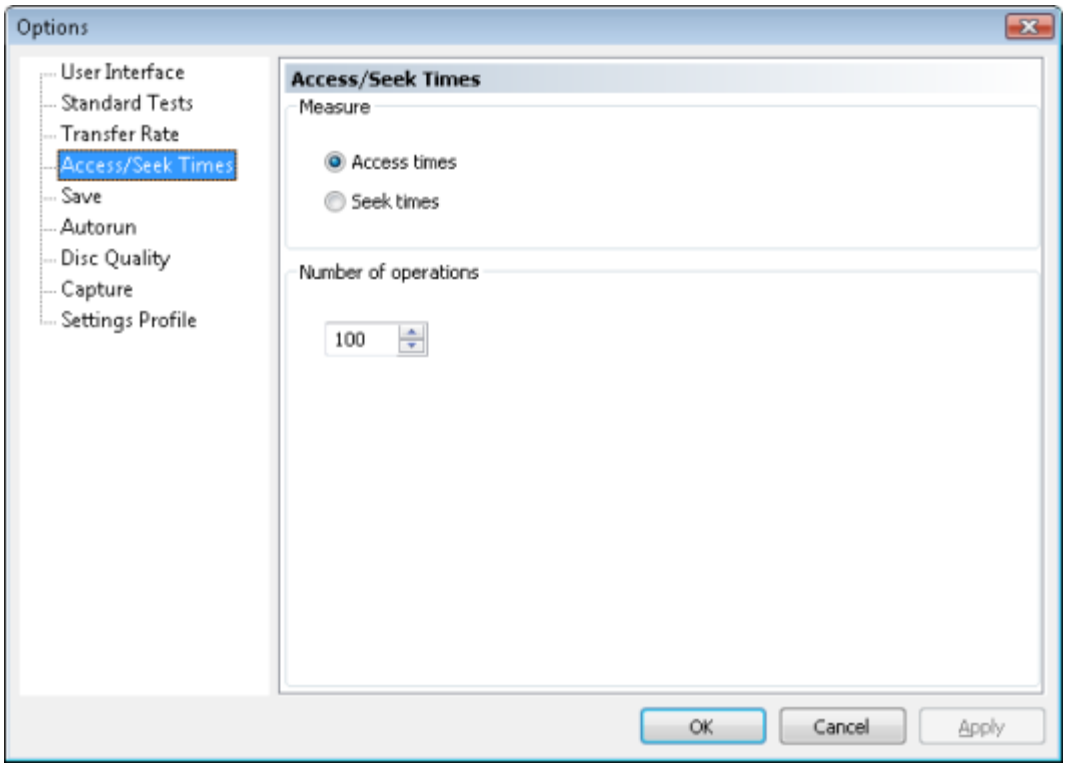
Area **Write mode**	Selects the **SAO** (Session-At-Once) or **TAO** (Track-At-Once) write mode for discs. You can also select the **Overburn CD** and **Overburn DVD** check boxes in Session-At Once mode. Enter the exact data quantity in the corresponding input fields.
Area **Disc type**	Enables burning simulation for either data or audio discs.
Check box **Buffer underrun protection**	Enables protection against optical drive buffer underrun. Buffer underrun protection is enabled by default. We recommend that you leave this check box selected.
Check box **Streaming**	Streaming can more than double the write speed. However, it can have a negative effect on the quality of the disc, since the disc is not checked during the burn process and defective sectors are not re-written. This check box is cleared by default, in other words verification is enabled. If this check box is enabled, verification will be disabled for DVD-RAM and Blu-ray discs.
Check box **Direct overwrite**	If this check box is selected, rewritable discs will be directly overwritten without having to delete old data first. If this check box is cleared, a dialog box will notify you when a disc containing data is inserted for writing.
Check box **Burning an image file**	If this check box is enabled, Nero DiscSpeed will run through the **Create data disc** test by creating an image file (ISO or NRG). If this check box is cleared, Nero DiscSpeed will run through the same test by burning binary data until the maximum capacity of the disc is reached.
Check box **Include test data**	If this check box is selected, additional information about the test (information on the optical drive, the installed firmware, and the burn process graph) will be burned to the disc.

See also

Transfer rate → 14

14.4 Access/Seek Times Navigation Entry

The **Access/Seek Times** navigation entry offers setting options in the **Measure** and **Number of operations** areas specifically for the **Access/seek times** test.



Nero DiscSpeed - Options - AccessSeek Times navigation entry

The following setting options are available:

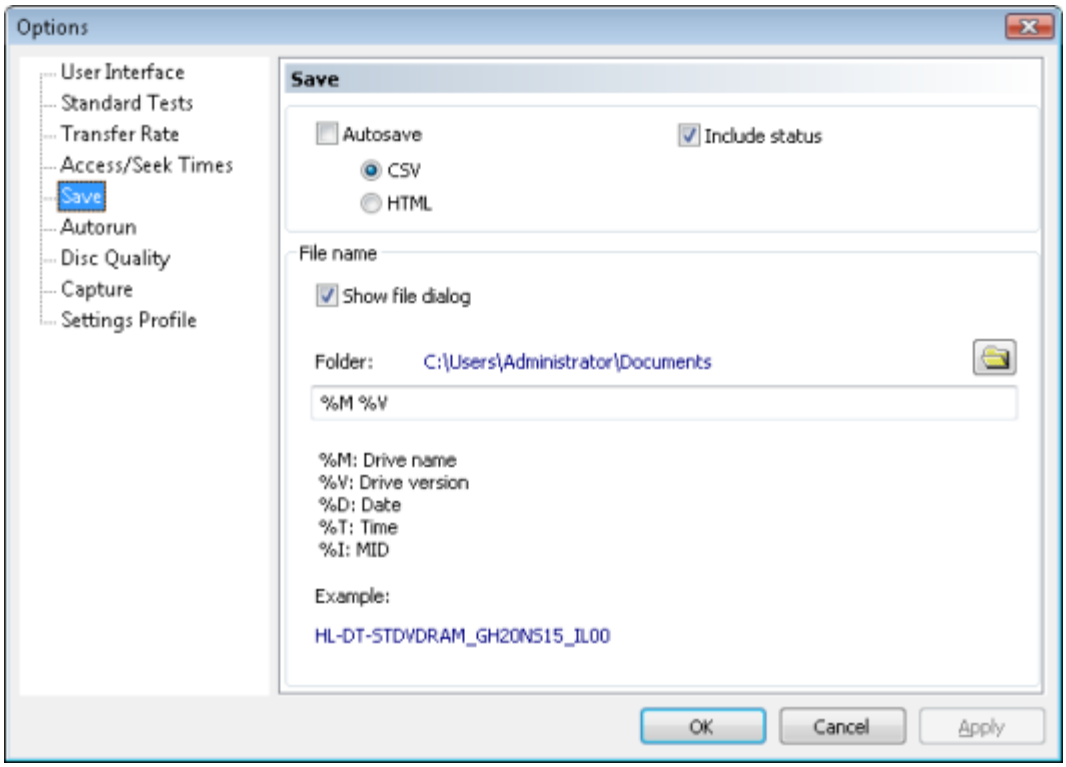
Area **Measure**	Defines which of the two tests will be run - Access times or Seek times.
Input field **Number of operations**	Defines how many times the selected test is run. The higher the value that you enter, the more accurate the measurement result is. However, the duration of the test becomes longer if the test is repeated often. The test is run 100 times by default.

See also

Access/Seek Times → 16

14.5 Save Navigation Entry

Under the **Save** navigation entry you can specify a storage location and file name that are automatically selected if you have enabled the **Autosave** feature.



Nero DiscSpeed - Options - Save navigation entry

The following setting options are available:

Check box **Autosave**	If this check box is enabled, Nero DiscSpeed will automatically save all test results, either in CSV or in HTML format.
Check box **Include status**	If this check box is enabled, Nero DiscSpeed will not only save the graph, but also all additional information appearing in the display area.
Check box **Show file dialog**	If this box is checked, an appropriate dialog box will open before the file is saved. Here you can choose a file name and specify where the file is to be saved. If this box is not checked, then all files will be automatically saved in the specified folder. The file name is automatically created.
Button 	Opens the **Find Folder** window. Here, you can specify the folder in which the file should be saved.

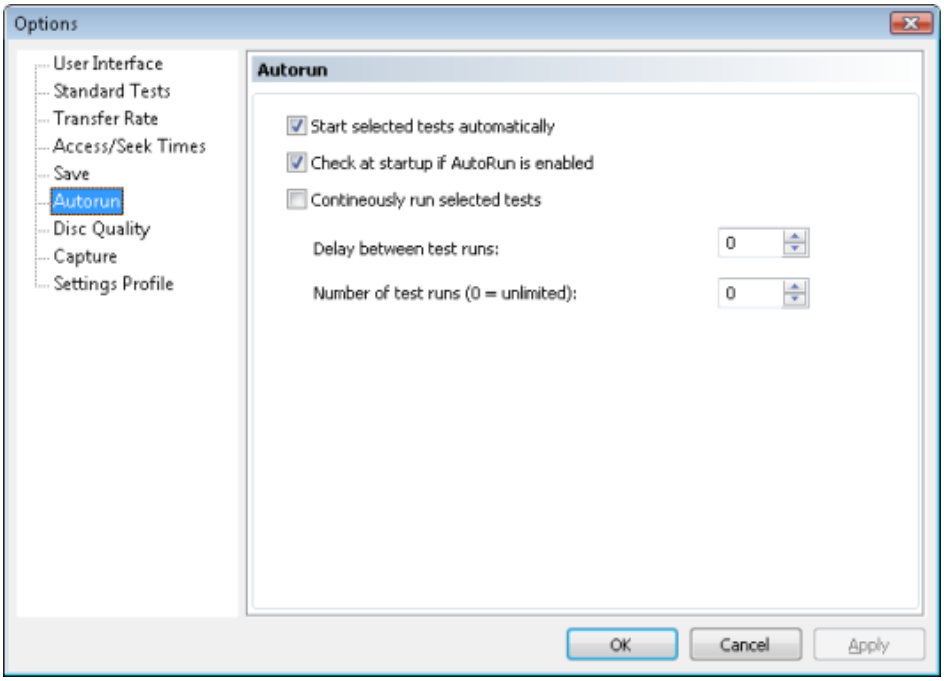
Input field	Creates file names based on the following user-defined parameters: drive name, **drive version**, **date**, **time**, and **MID** (Media Identification Code). You can compile the parameters in any order. Arrange all the parameters you want in the input field. If all parameters are cleared from the input field, the file name cannot be automatically generated. Only works if the **Show file dialog** check box is enabled.

See also

Saving Test Data → 47

14.6 Autorun Navigation Entry

You can configure detailed settings for the autorun feature under the **Autorun** navigation entry.



Nero DiscSpeed - Options - Autorun navigation entry

The following check boxes are available:

Start selected tests automatically	Automatically starts the series of tests selected under the **Standard Tests** navigation entry as soon as a disc is inserted in the optical drive. If this check box is cleared, the test series must be manually started.

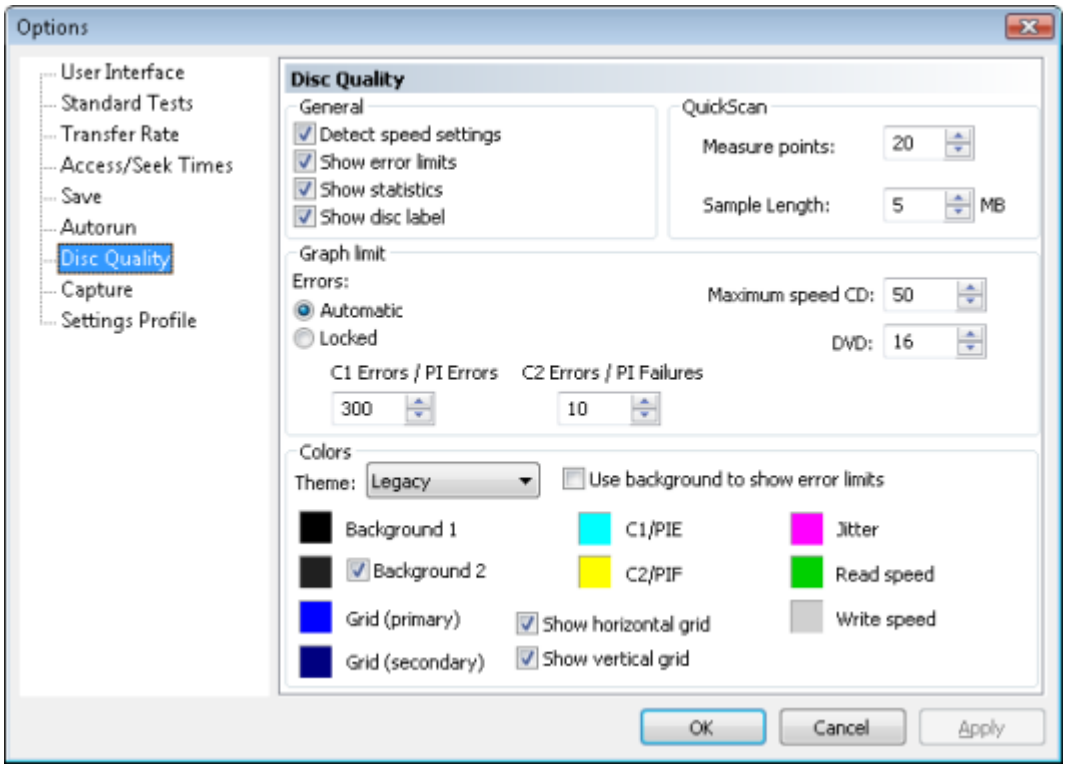
Check at startup if Auto-Run is enabled	Starts Nero DiscSpeed displaying a message window when AutoRun is disabled. You can enable AutoRun here.
Continuously run selected tests	Defines how many times the tests selected under the **Standard Tests** navigation entry will be run. The following options are available if this box is checked: **Delay between test runs -** Defines the length of the delay between two test runs. **Number of test runs** - Defines how many times the tests will be repeated. If the value selected is **0**, the tests will be repeated until you manually stop them.

See also

Standard Tests Navigation Entry → 54

14.7 Disc Quality Entry

The **Disc Quality** navigation entry offers setting options for the **quality** test in the **General**, **QuickScan**, **Diagram Margins** and **Colors**.



Nero DiscSpeed - Options - Disc quality navigation entry

The following check boxes are available in the **General** area:

Detect speed settings	The speed the **Disc Quality** is tested, can change with the choosed optical drive. The speed is connected to the recorder model and the installed firmware. If the check box is active, Nero DiscSpeed automatically detects the speed, as soon as the **Disc quality** tab in the main screen is selected. If this box is not checked, the speed must be manually detected.
Show error limits	Shows the intervals in the diagram of the graphical representation in colored graduations. Depending on the optical drive model and the intervals at which they occur, detected errors can be classed at a glance as permissible, tolerable, or unacceptable.
Show statistics	Shows a statistical overview of the results at the end of the test.
Show disc label	Shows the disc label on the **Disc Quality** tab.

In the **QuickScan** area you can define the options for the quick scan. The **Disc Quality** could be executed as complete scan. You can choose between the quick and the full scan on the **Disc Quality** tab. The quick scan only checks defined points on the disc. All other areas are ignored. As a result, it requires less time than a complete scan but is less accurate.

Measure points	Defines how many points on a disc will be checked during the quick scan.
Sample Length	Defines the size of each scan point in MB.

In the **Graph limit** area you can define the maximum scale limits for the graphical representation of the error curves. The following setting options are available:

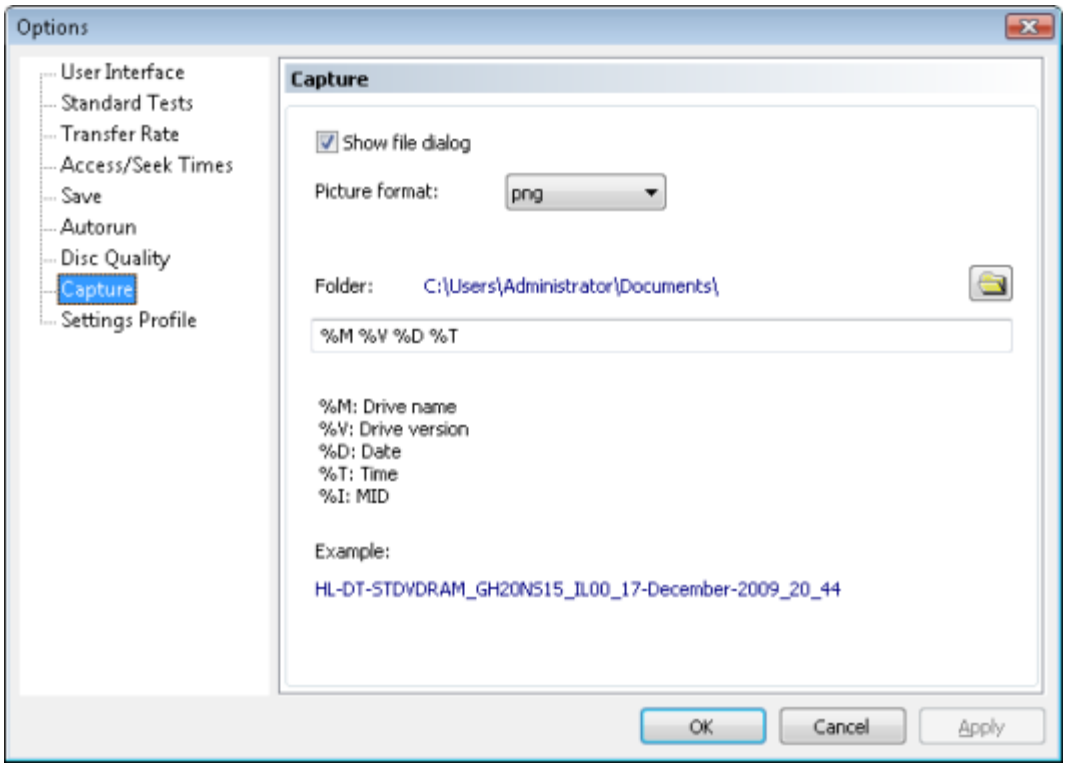
Option button **Automatic**	Automatically adapts the graduated scale values to the number of errors measured. A value of 10 is defined as the initial value for both **C1 Errors/PI Errors** and for **C2 Errors/PI Failures**. If more errors are found, Nero DiscSpeed automatically adapts the scales to the higher value.
Option button **Locked**	Defines the maximum values on the scales as locked. Enter the values you want in the **C1 Errors/PI Errors** and **C2 Errors/PI Failures** text boxes.
Selection area **Maximum CD speed**	Defines the maximum value that will be displayed in the **C1 Errors/PI Errors** curve for write and read speeds. This value is separately defined for **CDs** and **DVDs**.

In the **Colors** area you can define the colors on the **Disc Quality** tab in the main screen. The following setting options are available:

Menu **Theme**	Selects the desired theme. In addition to predefined themes, you can also set colors with the **costum** entry. To manually edit a color, click the colored tile and select the color you want in the dialog box that appears.
Button **Background 1**	Changes the basic color in the background of the graph area.
Button **Background 2**	Changes the basic color for shading in the background of the graph area. Only works when the **Background 2** check box is enabled. Otherwise, the background of the graph area is displayed in one single color.
Button **Grid (primary)**	Changes the colors for the coarse grid in the graph area. Only works when at least one of the following check boxes is enabled: **Show horizontal grid** and/or **Show vertical grid**.
Button **Grid (secondary)**	Changes the color for the fine grid in the graph area. Only works when at least one of the following check boxes is enabled: **Show horizontal grid** and/or **Show vertical grid**.
C1/PIE	Line signifying the C1 errors/PI errors in the graph.
C2/PIF	Line signifying the C2 errorsPI errors in the graph.
Jitter	Representation of Jitter in the graph.
Read speed	Line signifying the Read speed in the graph.
Write speed	Line signifying the write speed in the graph. This curve will only be displayed if the **Include test data** box has been checked under the **Transfer Rate** navigation entry.
Check box **Show horizontal grid**	Shows the horizontal grid lines in the graph area or hides them. This box is checked by default.
Check box **Show vertical grid**	Shows the vertical grid lines in the graph area or hides them. This box is checked by default.

14.8 Capture Navigation Entry

The **Capture** navigation entry offers setting options for saving test results with the help of the snapshot feature.



Nero DiscSpeed - Options - Capture navigation entry

The following setting options are available:

Check box **Show file dialog**	If this box is checked, an appropriate dialog box will open before the file is saved. Here you can choose a file name and specify where the file is to be saved. If this box is not checked, then all files will be automatically saved in the specified folder. The file name is automatically created.
Menu **Picture format**	Defines the file format in which snapshots are saved. Formats BMP, PNG, JPG, and TIFF are available.
Button 	Opens the **Find Folder** window. Here, you can specify the folder in which the file should be saved.
Input field	Creates file names based on the following user-defined parameters: drive name, **drive version**, **date**, **time**, and **MID** (Media Identification Code).

	You can compile the parameters in any order. Arrange all the parameters you want in the input field. If all parameters are cleared from the input field, the file name cannot be automatically generated. Only works if the **Show file dialog** check box is enabled.

15 Technical Information

15.1 System Requirements

Nero DiscSpeed is installed along with its suite. Its system requirements are the same. You can find more detailed information on the system requirements under www.nero.com.

- 16-bit Windows compatible sound card and speakers or headphones
- Optional: CD recorder

16 Glossary

A-BEX-Disc

An A-BEX disc is a test DVD that is used to test the error correction of an optical drive. For that purpose, the test DVD already comes delivered with defects such as scratches or fingerprints.

Access Time

The access time is the time a drive needs to move the read head to a specific position on the disc that is inserted in the drive and to additionally read an area of the disc. In other words, the access time encompasses the seek time and in addition the period of time for reading a specific area.

Blu-ray

Blu-ray technology refers to burning on special data carriers. In comparison to DVD's, which use a red laser in order to read and write data, Blu-ray discs are written with a blue laser. The shorter wavelength (405 nm) of this blue laser makes it possible to position the laser with greater accuracy. Data can be written in a more compact manner and takes up less space on the disc. A Blu-ray disc can store up to 25 GB on a single layer disc and up to 50 GB on a dual layer disc.

Book Type

The book type defines the specification (e.g. DVD-, DVD+, DVD-ROM) of a DVD. In order to ensure correct playback, the DVD specifications are defined in books so that all media can be read correctly. The specifications are defined in the so-called Rainbow Books, which are distinguished by means of their color (e.g. Yellow Book).

Buffer

A buffer refers to temporary memory that records and delivers data that cannot be processed immediately as required. The buffer also allows for continuous data flow.

C1 errors

A C1 error describes the error rate on the lower layers of a burned CD that are automatically corrected during reading. Every recordable disc features these errors; the fewer they are, the better the quality.

C2 errors

A C2 error describes the error rate on the lower layers of a burned CD that are automatically corrected during reading. Every recordable disc features these errors; the fewer they are, the better the quality. High C2 error rates indicate burn problems or quality flaws.

CD Text

CD Text consists of additional information on a CD that can store e.g. music track titles and artists. CD Text is stored in the so-called lead-in area of the CD before the audio data starts. The display on the CD player shows the additional data. You must have a CD burner which supports CD Text to enable the CD Text to be written to a CD. In particular, CD Text can only be written in disc-at-once mode.

CPU usage

The central processing unit processes a computer's processes. The higher the computing performance, the higher the load of the CPU and its performance.

DAE quality

DAE (Digital Audio Extraction) refers to the process of reading audio files with a drive. DAE quality indicates how well a drive reads data on a CD.

Disc type

Disc type refers to different optical storage media with different specifications. The best known are CD's and DVD's that can be written to once or multiple times, and which are manufactured with different storage capacities.

Dual Layer Disc

A dual layer disc refers to a DVD that uses two layers on one side, which increases its storage capacity.

DVD-RAM

Digital Versatile Disc Random Access Memory is the first rewritable data carrier format developed. It is characterized by a distribution of sectors that makes it possible to achieve increased data integrity, quicker formatting, and improved error management in comparison to DVD+/-RW.

Dye type

There are different materials of different colors that are used to produce storage media. The laser-sensitive and data-carrying dye layer can e.g. be made of phthalocyanine or formazan.

Firmware

Firmware is software that has been installed on hardware during production (e.g. recorder, USB device, etc.). It is used for communication between the respective hardware and other software, e.g. when a USB device is connected to a PC.

Jitter

Jitter refers to an abrupt and undesired change in the signal characteristics. Small gaps occur in the data stream as a result. Audio correction synchronizes the data by overlapping the sectors. This way, the gaps are not audible.

Lead-in
The leadin is the starting area (innermost area) of user data on a data carrier. This is where the table of contents and additional information concerning the disc is stored.

Lead-out
The leadout is the ending area of user data on a data carrier that is used to close a session. If the disc has not been completed yet, the reference for the next session is stored here.

Multisession Disc
A multisession disc can contain several sessions that are not fixed. This way, more data can be added in new sessions at a later point in time, and the disc is not closed until it is full.

On-the-fly
The name on-the-fly describes a burn process for discs. In this process, data is written to the disc directly from an image.

PI Errors
Parity of inner code is part of the structure of a DVD's data block, and is used for error correction purposes. If a PI in a DVD cannot be read, one speaks of a PI error.

PO Errors
The parity of outer code is part of the structure of the data block of a DVD and is used for error correction purposes. If a PO on a DVD cannot be read, one speaks of a PO error.

Read Speed
The read speed of a drive is a factor of the speed that the laser needs in order to read the data on an optical storage medium, e.g. 8x or 16x speed.

Ripping
Ripping refers to the process of extracting audio or video data from an optical storage medium onto a computer's hard drive in order to process it.

Rotational speed
Discs can be read and/or burned in different ways. As a general rule, the reading process in optical drives starts at the radius of the disc and moves from the center outwards. The two standards used to define the types of rotational speed are linear velocity and angular velocity. With constant angular velocity, the tracks at the center of the disc always travel at the slowest linear velocity. The linear velocity increases as you move away from the center towards the outer edge. Angular velocity (also called rotational speed) describes the change in the rotation angle over time independently of the radius of the disc, i.e. the velocity at which an object loops a sector.

RPM

Revolutions per minute (RPM) is an English unit that is used in mechanics to represent rotational speed. It indicates the number of complete revolutions per minute.

Search Time

The seek time is the time the drive needs to move the read head to a specific position on the disc that is inserted in the drive. In other words, the seek time encompasses the period of time between the arrival of a write or read command and commencement of the actual write or read process.

Sector

A sector is the smallest addressable information unit on a CD-ROM. A sector is composed of 2,352 bytes, of which - depending on the type of CD used - different amounts are available as user data. A sector generally consists of a header, synchronization bits and user data. It may also have error recognition and correction data.

Streaming

Streaming refers to the continuous transmission of data that can already be played during the transmission procedure. This means that it is not necessary to wait until a media file has been transmitted completely before it can be played back. A TV channel can be received and displayed at the same time without it first having to be saved to the hard drive.

Subchannel data

Subchannel data on a disc contains additional information, such as CD Text or information on positions.

Write Speed

The write speed indicates the speed at which a drive can write data to the optical storage medium, e.g. 8x or 16x speed.

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