
# User Guide

## Lenovo UEFI Diagnostics for Think and Idea

**Version 03.08.000**

**Revision History**

| Revision | Date | Description of changes |
|---|---|---|
| 1 | April 18, 2016 | Initial Version |
| 2 | June 03, 2016 | Updated to version 3.5 |
| 3 | Aug 12, 2016 | Updated to version 03.06.000 |
| 4 | Aug 23, 2016 | Updated to version 03.07.000<br>- Recover Bad Sectors tool runs on SSDs devices |
| 4.1 | Oct 18, 2016 | Updates for UEFI 03.07.001<br>- Minor changes and bugfixes |
| 4.2 | Nov 21, 2016 | Minor changes:<br>- Improved section Download the Bootable UEFI Diagnostics and Create a Bootable USB<br>- Repalaced LCD by Display;<br>- Removed any mentions of Configuration File as this version does not include that feature; |
| 4.3 | Nov 29, 2016 | Updated for UEFI 03.08.000<br>- Updated Storage test section;<br>- Added new test: Smart Wearout Test<br>- Updated Figure 21 |
| 5 | Jan 05, 2017 | Reviewed the User's Guide<br>- Minor changes and bugfixes;<br>- Updated all mock-ups |

# Summary

## Objective

This document describes what is necessary to run the Lenovo UEFI Diagnostic tests.

## Install and Run the UEFI diagnostics

Note: No installation is required for the embedded UEFI Diagnostics.

## Download the Bootable UEFI Diagnostics and Create a Bootable USB Flash Drive Using Windows GUI

1. **Save the UEFI Diagnostics image and Bootable Generator:**
    a. Go to www.Lenovo.com/diags
    b. Click “Downloads.”
    c. Under “Lenovo UEFI Bootable Diagnostics,” click on “Create Bootable USB with UEFI Diagnostics”.
    d. Download UEFI Diagnostics zip file. Save the file. (*If your system has an Atom CPU, then click on “Lenovo UEFI Diagnostics – Bootable USB for Atom CPU based Tablet – ThinkPad 10” instead*.)
    e. Download Bootable Generator Zip file.
2. **Run the Bootable Generator application.**
    a. Insert a USB flash drive.
    b. Go to the folder where you saved the bootable generator and double click on it.
    c. Double click “BootableGenerator.exe.”
    d. Your flash drive name will appear under “Select a device.” Click to select it. If you want to, you can type a new name for the device.
    e. Click “Search.” Click on the image name that you saved in step 1, letter d.
    f. Click “Generate.”
    g. A message will appear, warning that all existing files on the flash drive will be erased if you continue. If you are OK with that, then press “Yes” to continue.

## Run the UEFI Diagnostics

**3. Run the UEFI Diagnostics from a Bootable Flash Drive**

a. Create the Bootable flash drive, as explained in sections 1 and 2.

b. If Secure Boot is enabled in BIOS, disable it.

c. Insert the flash drive.

d. Restart the machine, then immediately, press F12.

e. On the boot menu, select your usb flash drive, and press Enter.

f. The UEFI diagnostics menu will display on your screen.

**4. Run the Embedded UEFI Diagnostics**

Boot the system, then immediately press:

- F10 for Think systems
- F11 for Idea systems

The UEFI diagnostics menu will display on your screen.

## Main Screen

The main screen for UEFI Lenovo Diagnostics is shown in Figure 1.

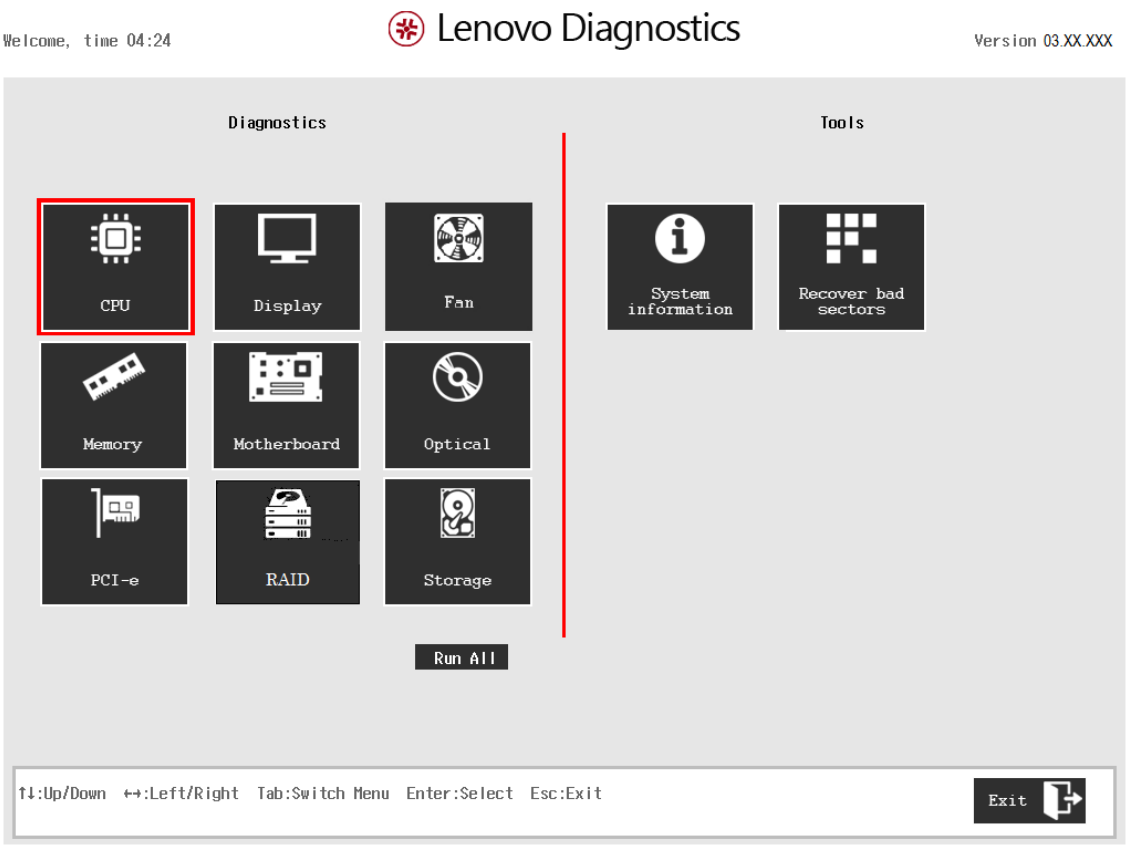


**Figure 1 - Application Main Screen**

The main screen is displayed right after the machine is booted from a USB flash drive containing the application. The Main Screen provides options to run all available device tests installed in the machine, options to see detailed information about the machine devices, and options to exit the application. The Main Screen is composed of:

- An Application Title Bar
- Two main sections (Diagnostics and Tools)
- An Instruction Bar

The Application Title Bar contains the name of the application and the Instruction Bar contains instructions for using the application. The Main Screen has two main sections: Diagnostics and Tools. The Diagnostics section provides options to run all installed tests and an option to exit the application. The Tools section provides options to use several tools.

The currently selected option is squared in red. The other options are not squared. The user can change the selected option by pressing the arrow keys. The up and down arrow keys are used to change the selected option in the same section (Diagnostics or Tools). The tab key is used to change the section (from Diagnostics to Tools, and vice versa). To run the selected option, the user must press the ENTER key.

Diagnostics options are:

- CPU
- Display
- Fan
- Memory
- Motherboard
- Optical
- PCI-e
- Raid
- Storage

Tools options are:

- System Information
- Recover Bad Sectors tools

The “CPU quick test” is an option that runs the cpu quick test and displays the CPU quick test screen.

The “CPU extended test” is an option that runs the CPU extended test and displays the CPU extended test screen.

The “Display  test” is an option that runs the Display test and displays the test screen.

The “Fan test” is an option that runs the Fan test and displays the test screen.

The “Memory quick test” is an option that runs memory quick test and displays the memory quick test screen.

The “Memory extended test” is an option that runs the memory extended test and displays the memory extended test screen.

The “Memory bit fade test (180 min)” is an option that runs the memory bit fade test and displays the memory bit fade test screen.

The “Motherboard test” is an option that runs the Motherboard test and displays the Motherboard test screen.

The “Optical device test” is an option that runs the Optical device test and displays the Optical device test screen.

The “PCI-e test” is an option that runs the PCI express test and displays the PCI express test screen.

The “RAID test” is an option that runs the RAID test and displays the RAID test screen.

The “Storage device test” is an option that runs the storage device quick test and displays the storage device quick test Screen.

“System Information” option, displays tabs with the machine and memory information displaying “System Information” screen.

“Recover Bad sectors” option allows the execution of the tool in oder to recover bad sectots on storage devices.

The “Exit Application” is an option that closes the application;

## CPU

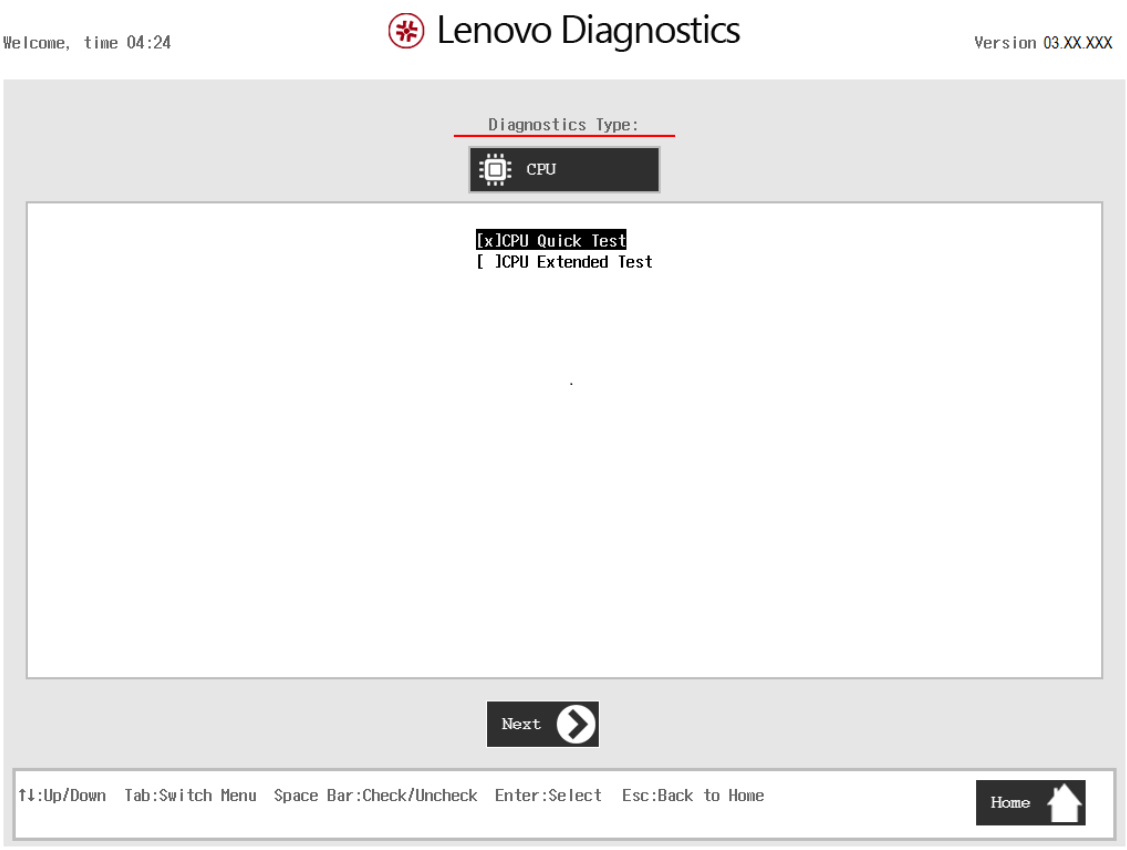


**Figure 2 – CPU screen**

## CPU Quick Test

The system allows the user to access the CPU quick test diagnostic from the Main screen -> Diagnostics -> CPU.

The currently selected option has a “x” in front of the option. To access the CPU quick test diagnostic on screen, the user can press the UP/DOWN arrow keys until the "CPU quick test" and press SPACE Key to select it.

To run selected option user has to press the ENTER key on button “Next”. After that, the system will show a list of tests, as illustrated in figure below, and all the tests are initially selected to be tested (‘X’ between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the “Select/deselect all option” is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the “Select/deselect all option” again, all tests options will also be selected again.


**Figure 3 – CPU quick test**

At least one test must be selected so the application can run the diagnostic. After the user chooses which tests must be performed, the user can select the “Run Tests” option by pressing the ENTER key. The system will run all tests, as illustrated in Figure below. The user can also press the ESC key to go back to the Main Screen.

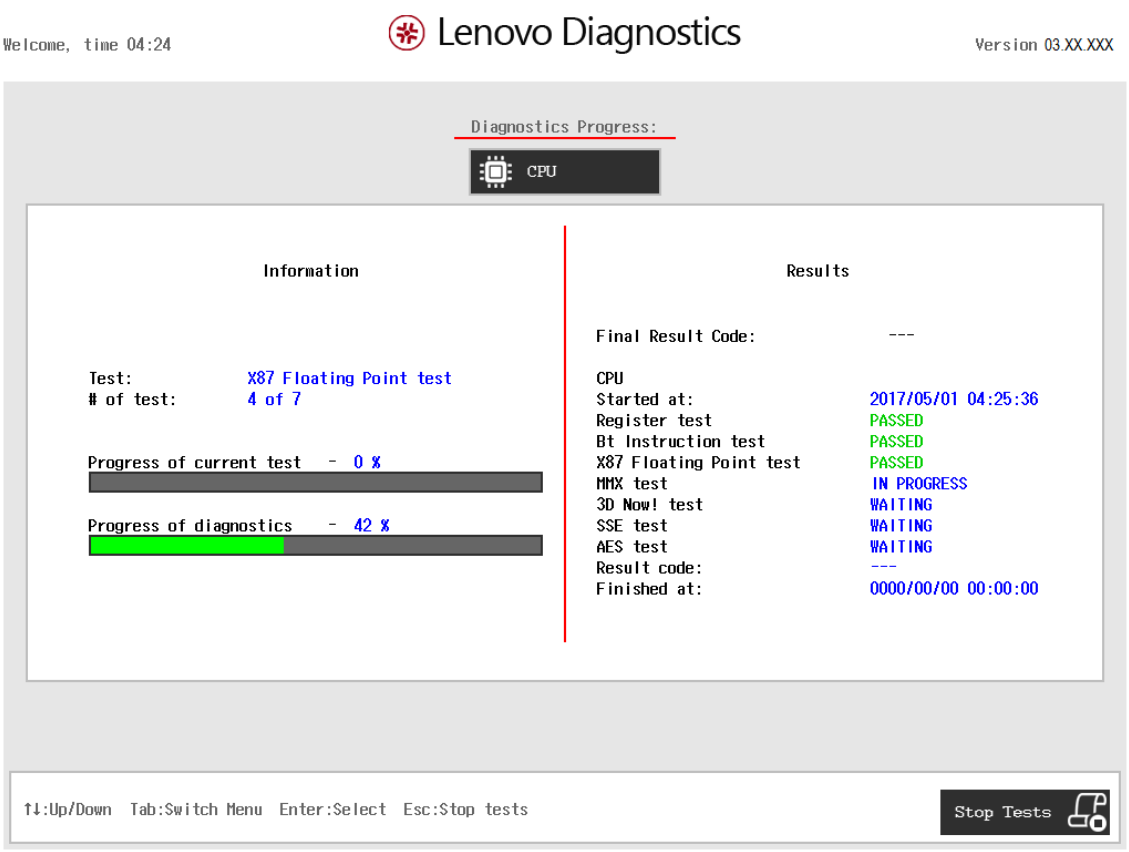


**Figure 4 - CPU quick test progress**

The CPU diagnostics progress screen provides information about the CPU progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, CPU), Instruction Bar contains instructions to run the test. The CPU screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);

- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## CPU Extended Test

The system allows the user to access the CPU Extended Test diagnostic from the Main screen -> Diagnostics -> CPU.

The currently selected option has a “x” in front of the option. To access the CPU Extended Test diagnostic, the user can press the UP/DOWN arrow keys until the "CPU Extend Test" option inside CPU module. To run selected option user has to press the ENTER key on button “Next”. When the user presses ENTER, the application will run the “Stress test”, and it will take about 10 minutes to complete.

The CPU diagnostics progress screen provides information about the CPU progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, CPU), Instruction Bar contains instructions to run the test. The CPU screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);
- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;

- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Display

After the user starts the “Display Test” option, the application computes the number of algorithms that can be performed by the test. If the test has more than one algorithm, “Select Algorithms” is displayed, as shown in Figure below.

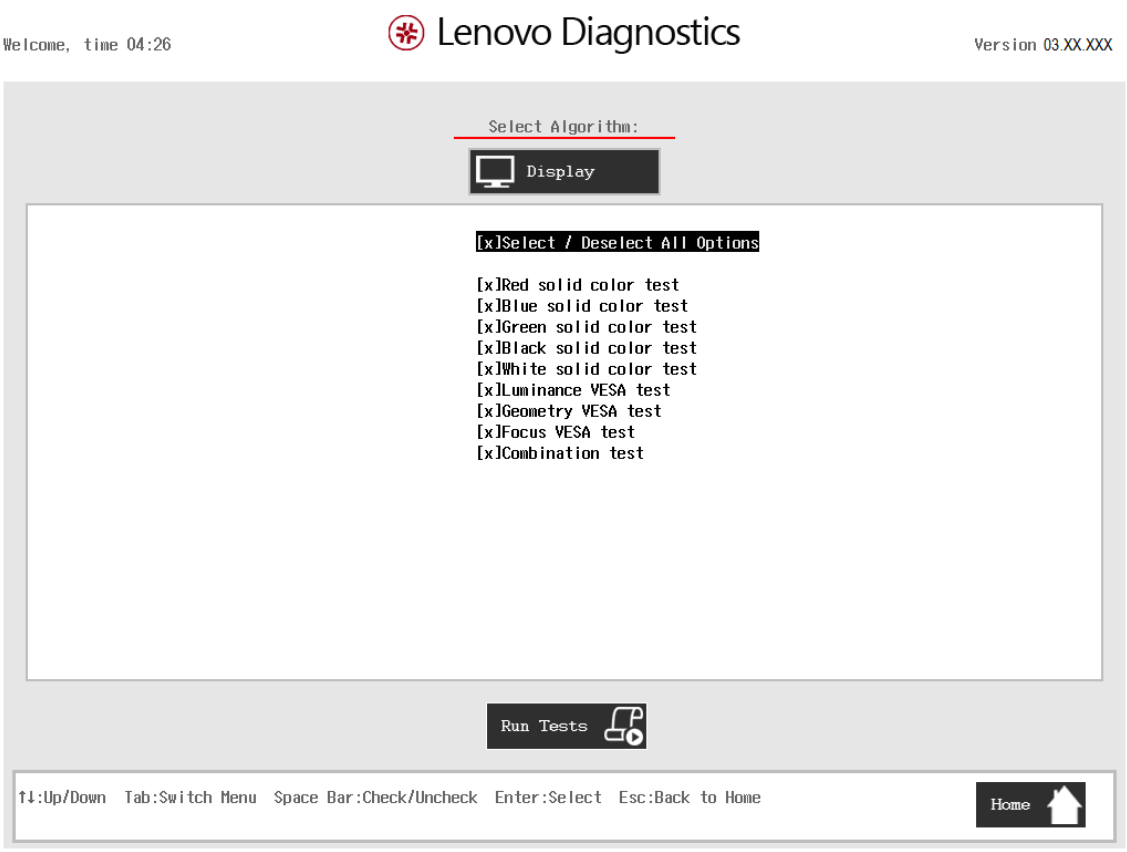


**Figure 5 - Select Algorithms Screen**

The “Select Algorithm” screen allows the user to select which algorithms will be tested by the application. After the user chooses at least one test and chooses the “Run Tests” option on the “Select Algorithms” screen, the Display tests starts:

Before an algorithm is run, a window containing instructions about the algorithm is displayed, as shown in Figure 6. The User can press the ‘Enter’ key to proceed with the algorithm execution or can press ‘Esc’ to abort the test.


**Figure 6 - Window is displayed with instructions for user about current LCD test**

If the user chooses to proceed with running the test, an image pattern will be displayed on the screen, as shown in Figure 7. After the user checks the LCD, any key can be pressed to proceed with running the

test.

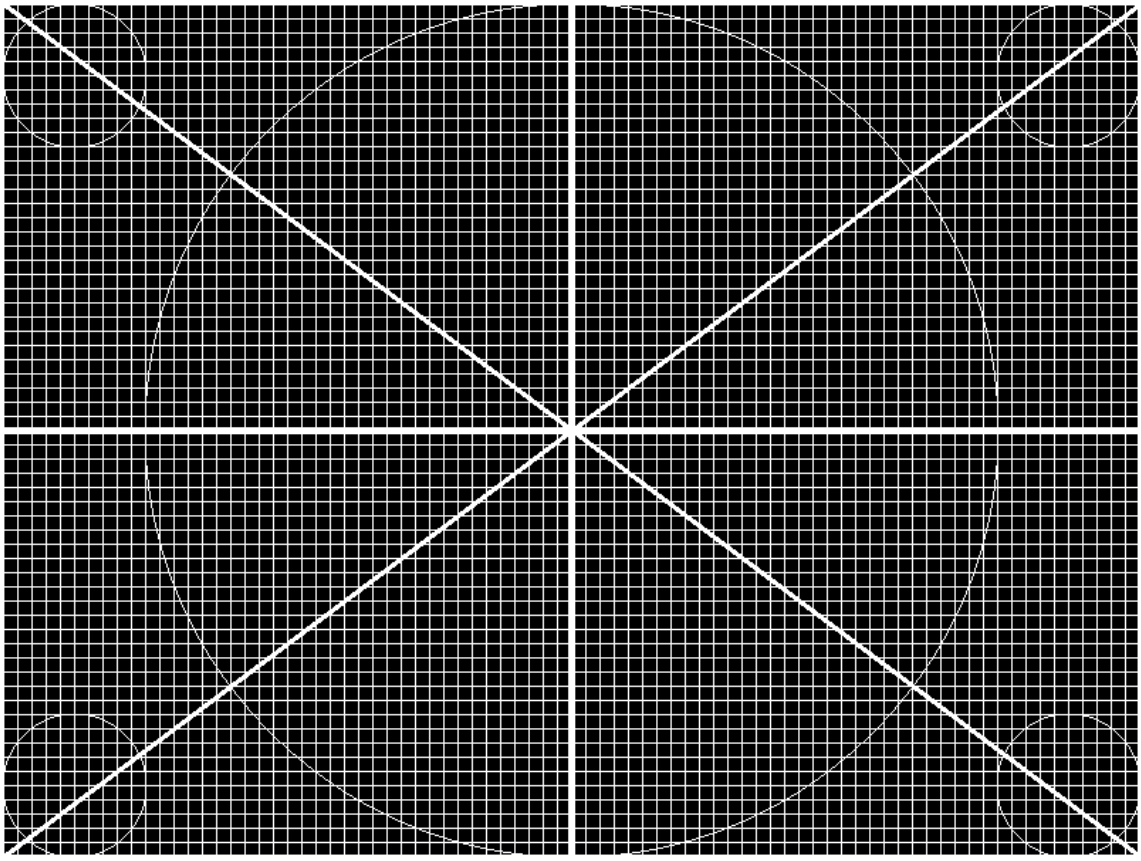

**Figure 7 - Screen painted with pattern of current LCD test**

After that, a window is displayed, asking the user if the pattern was painted correctly on the Display screen. If so, the user must press the 'Y' key; if not, the user must press the 'N' key. This window can be seen in Figure 8.

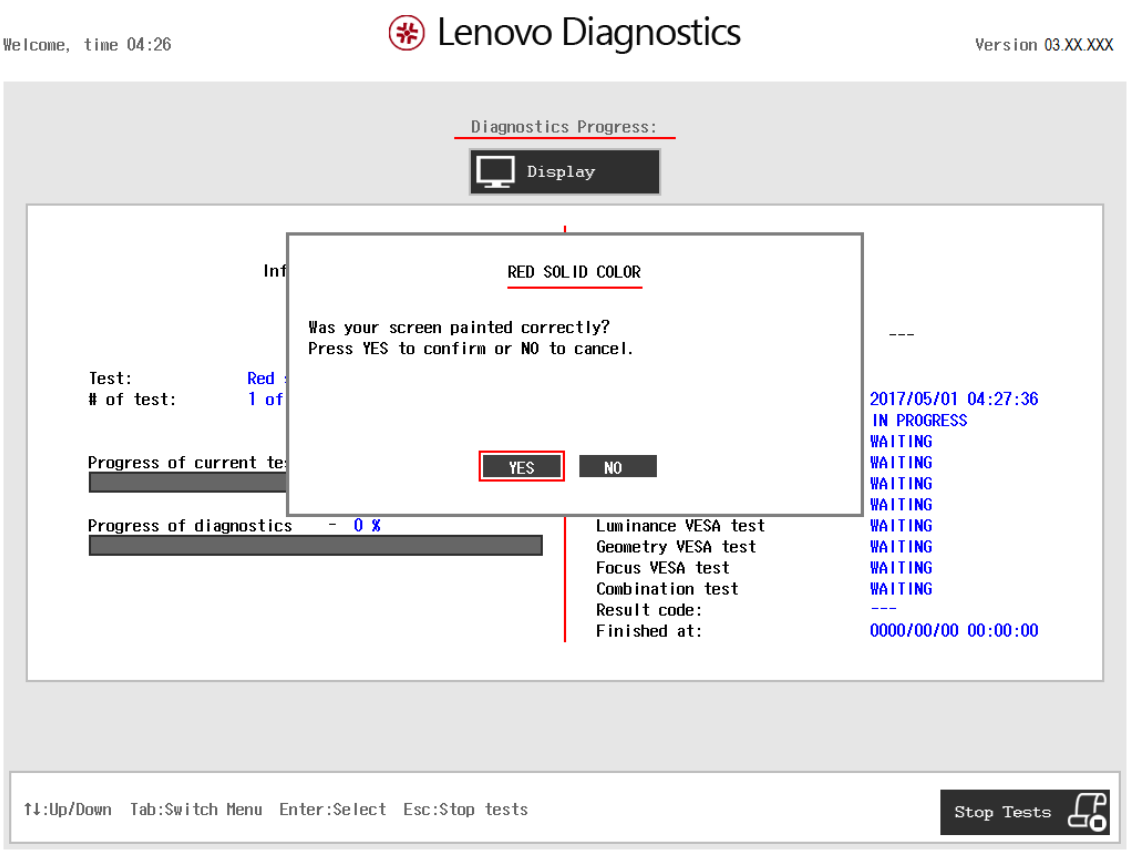


**Figure 8 - Window asking user if screen was painted correctly**

This process is repeated for each selected algorithm. After the test is finished or canceled, the user can go back to the Main Screen by pressing the ESC key again or to the Log Screen by pressing the F3 key.

## Fan Test

After the user starts the “PCI-e” option, the application computes the number of algorithms that can be performed by the test and starts the test, as shown in Figure 9.

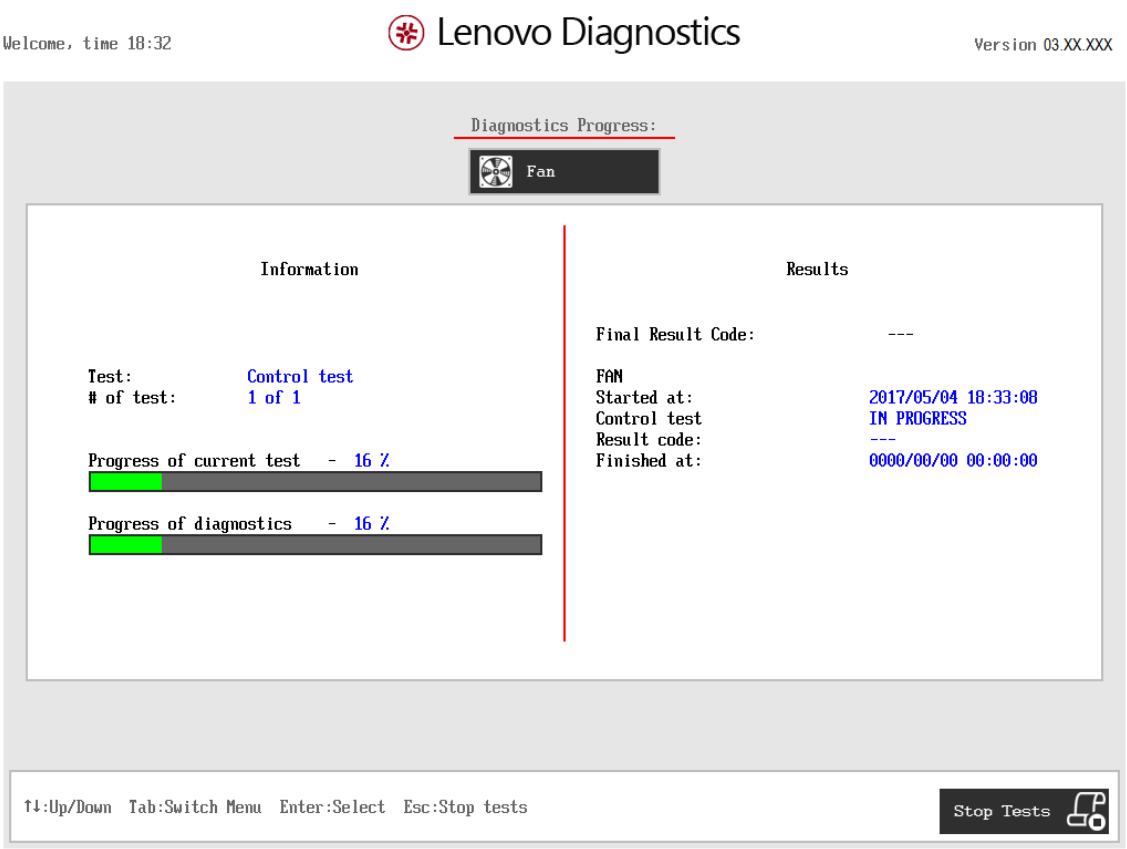


**Figure 9 - Fan test screen**

The Fan diagnostic progress screen provides information about the Fan progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Fan), Instruction Bar contains instructions to run the test. The Fan screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);

- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

# Memory

## Memory quick test

The Memory quick test Screen is shown in Figure 10.

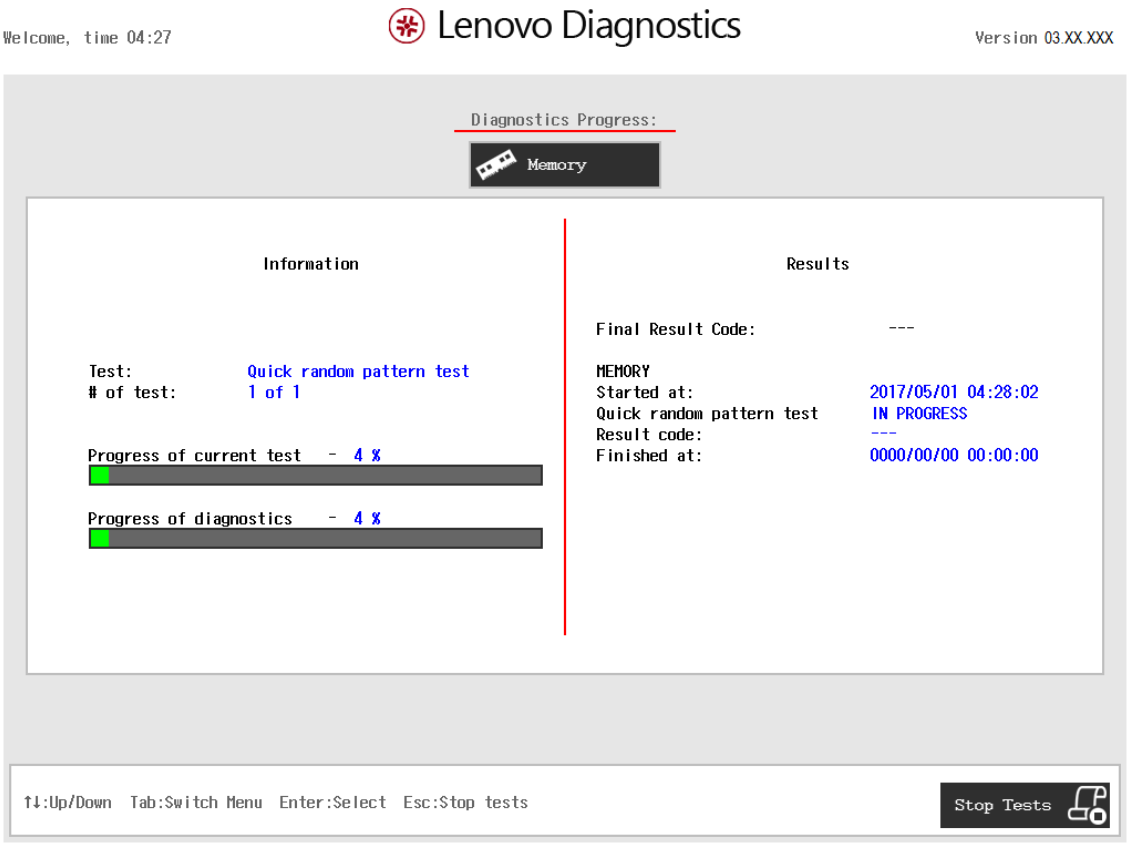


**Figure 10 - Memory – Quick test Screen**

The system allows the user to access the Memory Quick Test diagnostic from the Main screen -> Diagnostics -> Memory.

The Memory diagnostics progress screen provides information about the Memory progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);

- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Memory), Instruction Bar contains instructions to run the test. The Memory screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);
- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Memory Extended Tests

The system allows the user to access the Memory Extended Diagnostic from the Main screen -> Diagnostics -> Memory.

The currently selected option has a “x” in front of the option. To access the Memory Extended Test diagnostic on screen, the user can press the UP/DOWN arrow keys until the "CPU quick test" and press SPACE Key to select it.

To run selected option user has to press the ENTER key on button “Next”. After that, the system will show a list of tests, as illustrated in Figure 11 below, and all the tests are initially selected to be tested (‘X’ between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the “Select/deselect all option” is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the “Select/deselect all option” again, all tests options will also be selected again.

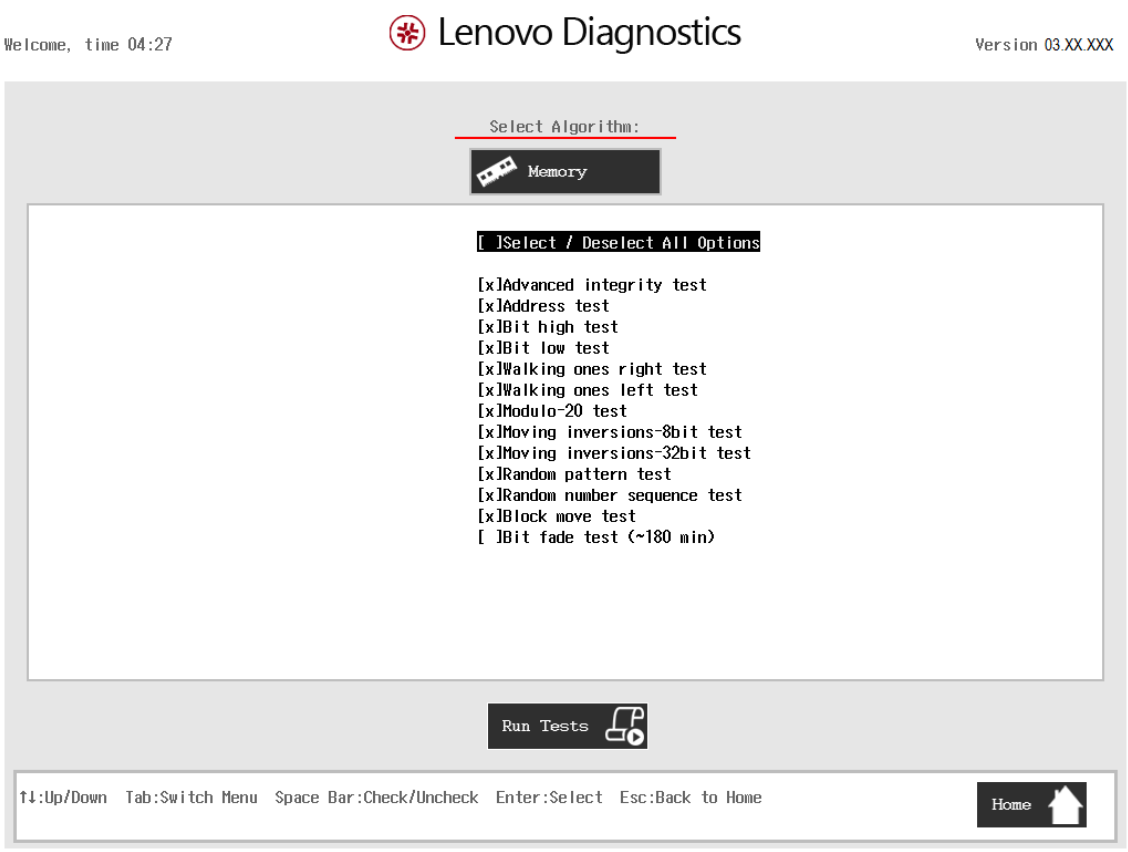


**Figure 11 - Memory extended test**

At least one test must be selected so the application can run the diagnostic. After the user chooses which tests must be performed, the user can select the “Run Tests” option by pressing the ENTER key. The system will run all tests, as illustrated in Figure 12 below. The user can also press the ESC key to go back to the Main Screen.

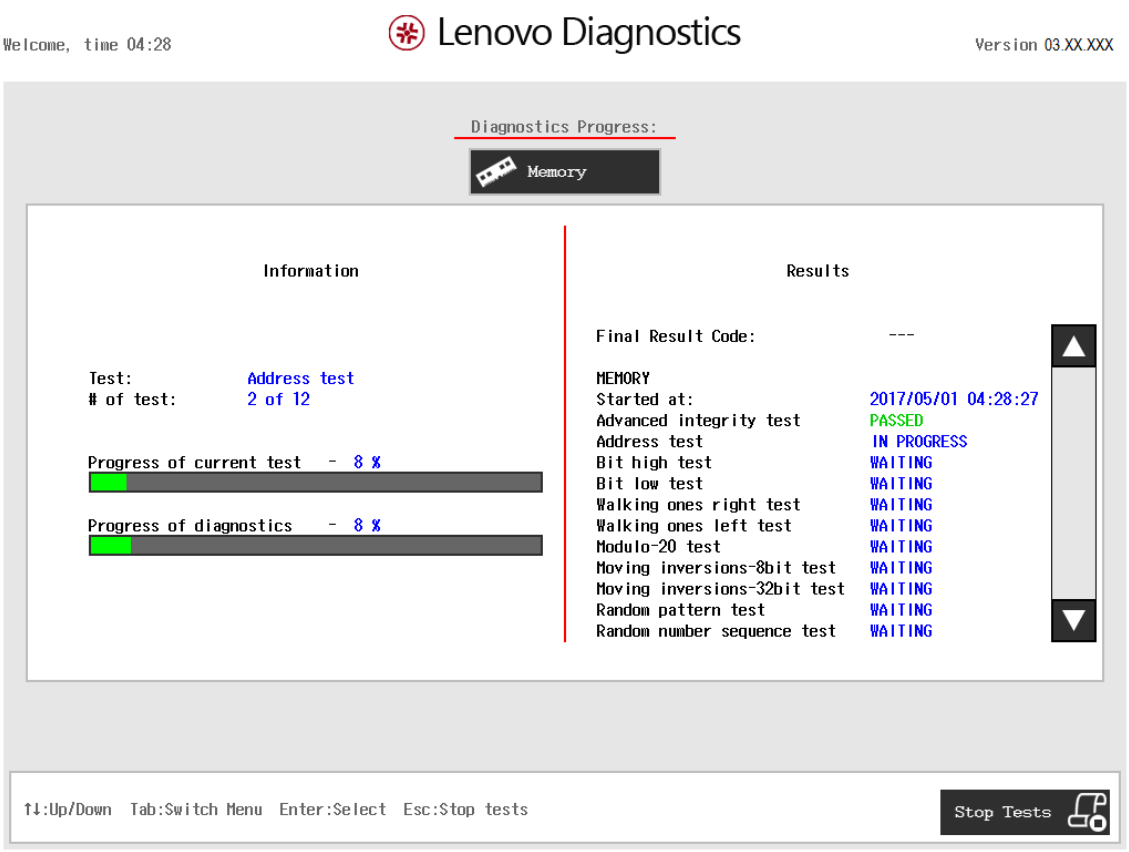


**Figure 12 - Memory extended test progress**

The Memory diagnostics progress screen provides information about the Memory progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Memory), Instruction Bar contains instructions to run the test. The Memory screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);

- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Motherboard Test

After the user starts “Motherboard test” option, the application computes the number of algorithms that can be performed by the test. If the test has more than one algorithm, “Select Algorithms” is displayed, as shown in Figure 13.


**Figure 13 - Select Algorithm Screen**

The system allows the user to access the Motherboard Diagnostic from the Main screen -> Diagnostics -> Motherboard.

The currently selected option has a “x” in front of the option. To run selected option user has to press the ENTER key on button “Next”. After that, the system will show a list of tests, as illustrated in Figure 13 above, and all the tests are initially selected to be tested (‘X’ between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the “Select/deselect all option” is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the “Select/deselect all option” again, all tests options will also be selected again.

At least one test must be selected so the application can run the diagnostic. After the user chooses which tests must be performed, the user can select the “Run Tests” option by pressing the ENTER key. The system will run all tests, as illustrated in Figure 14 below. The user can also press the ESC key to go back to the Main Screen.

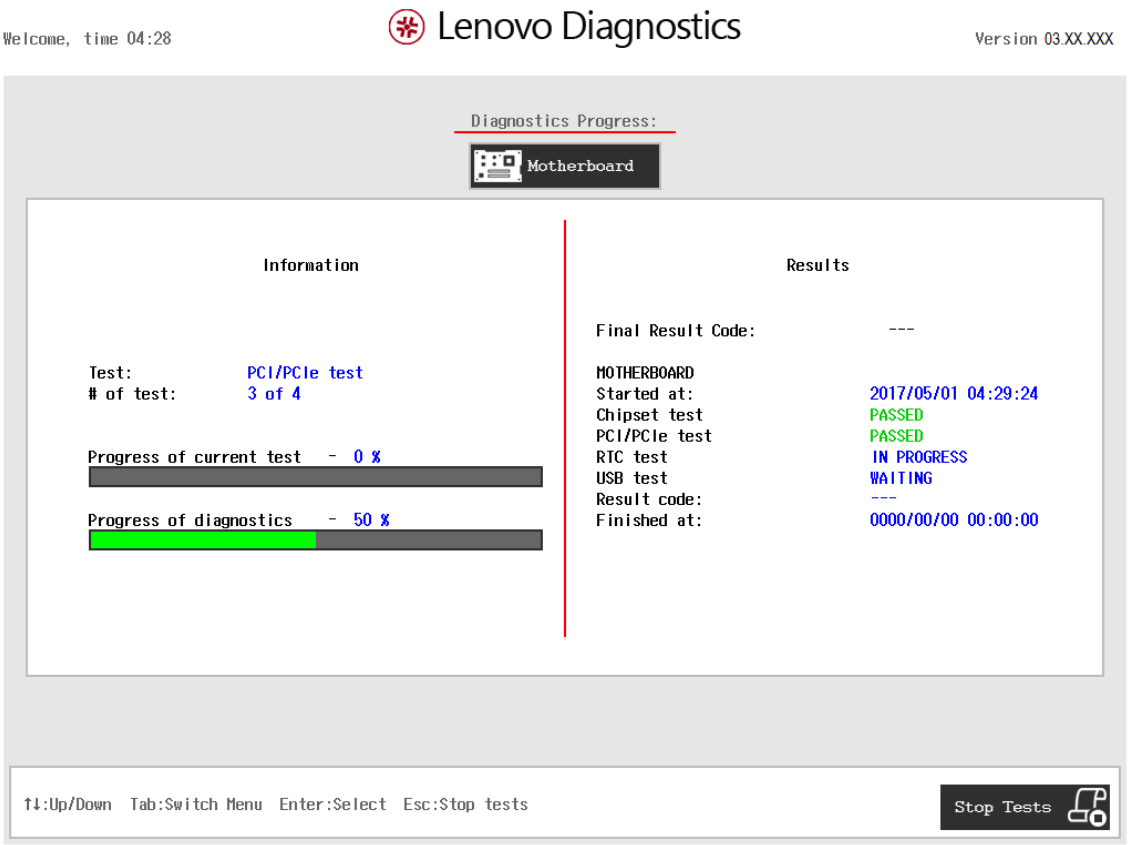


**Figure 14 - Motherboard test screen**

The Motherboard diagnostics progress screen provides information about the Motherboard progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Memory), Instruction Bar contains instructions to run the test. The Memory screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);
- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),

- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## PCI-e Test

After the user starts the "PCI-e" option, the application computes the number of algorithms that can be performed by the test and starts the test, as shown in Figure 15.

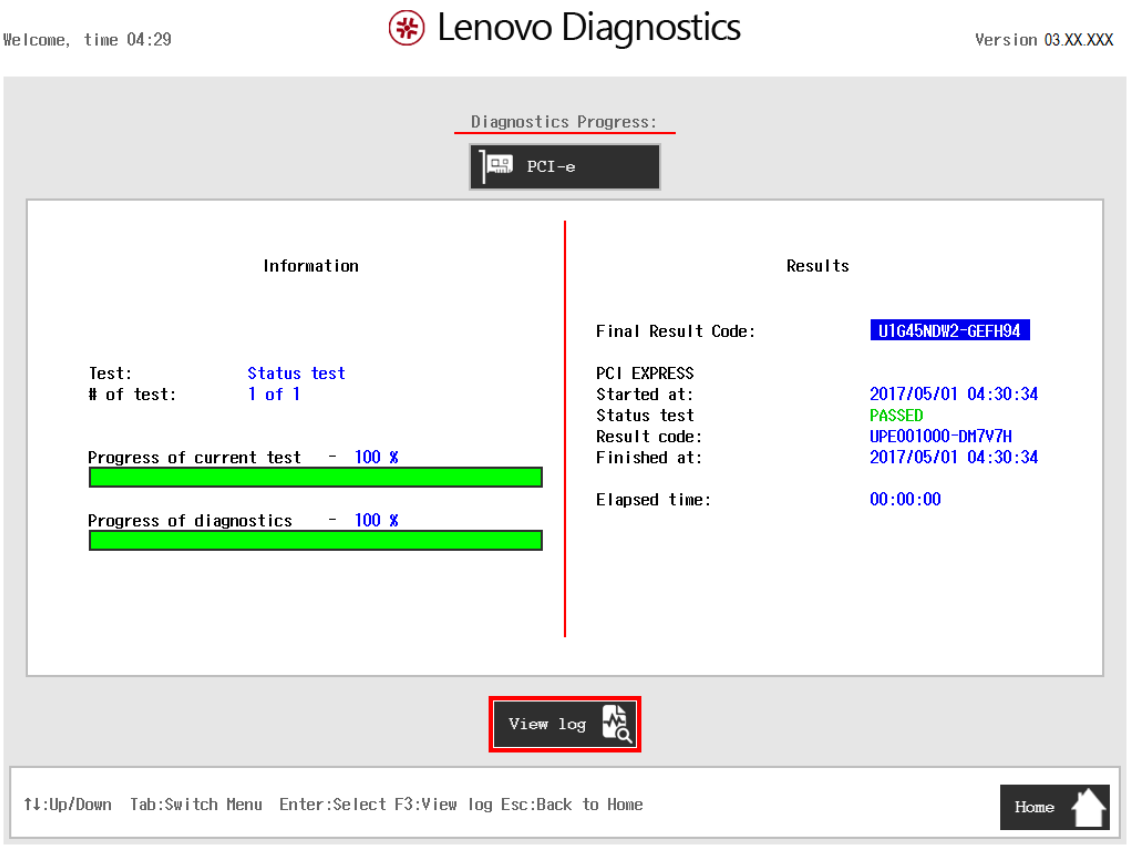


**Figure 15 - PCI Express test screen**

The PCI-e diagnostic progress screen provides information about the PCI progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Memory), Instruction Bar contains instructions to run the test. The Memory screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);
- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;

- NOT APPLICABLE, indicating algorithm is not supported by device),

- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## RAID Test

After the user selects “Raid” option, the application will display the number of Raid devices installed in the machine. If there is more than one raid device installed in the machine, the menu “Select Device” is displayed, as shown in Figure 16.

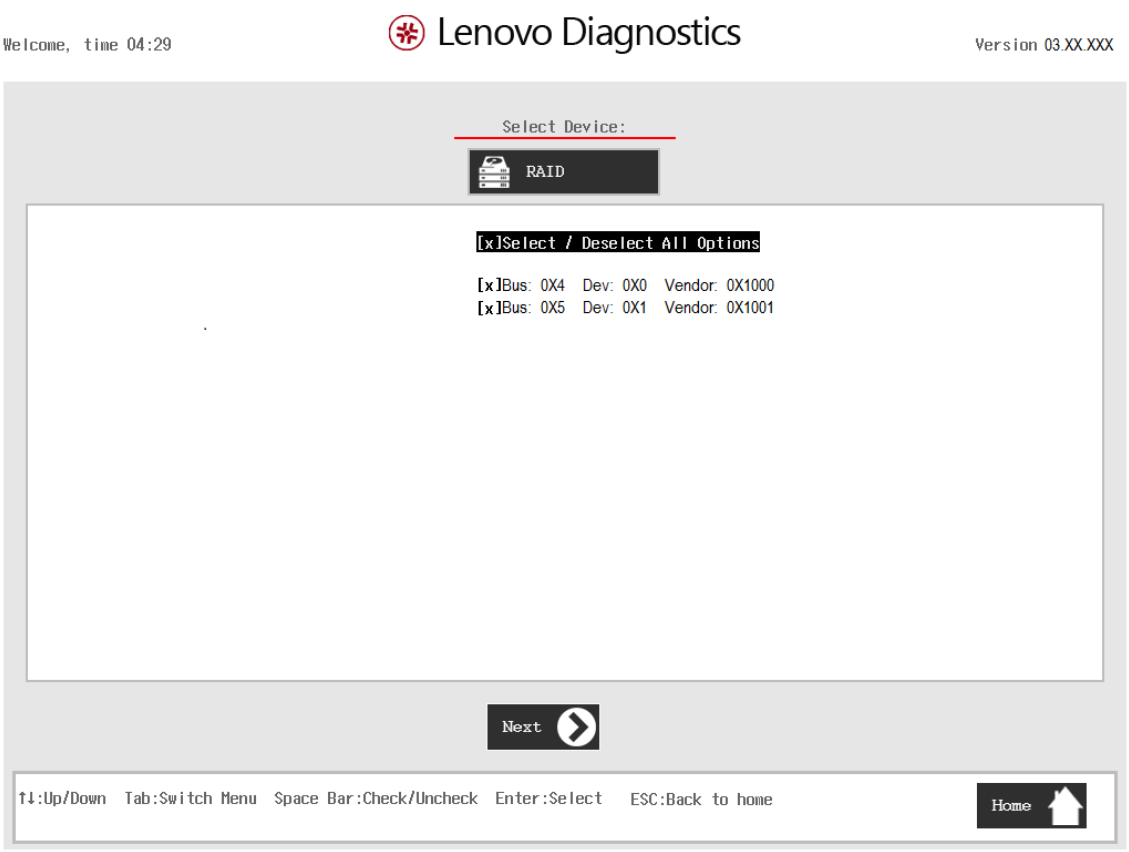


**Figure 16 - RAID test selecting device**

The currently selected option has a “x” in front of the option. To run selected option user has to press the ENTER key on button “Next”. After that, the system will show a list of tests, as illustrated in Figure 16 above, and all the tests are initially selected to be tested (‘X’ between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the “Select/deselect all option” is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the “Select/deselect all option” again, all tests options will also be selected again.

At least one device must be selected so the application can run the diagnostic. After the user chooses which devices must be performed, the user can select the “Next” option by pressing the ENTER

key. The system will show the screen where user can select the tests wants to performed for selected devices.


**Figure 17 - RAID selecting tests**

Initially, the “Select/deselect all” option is selected. If the user deselects this option by pressing SPACE, then all the test options will be deselected. If the user selects the “Select/deselect all” option again, all the test options will be selected again.

At least one test must be selected so that the application can run the diagnostic. After the user chooses which tests will be performed, the user can press the ENTER key or select the RUN TEST option and press the SPACE key. The system will run the tests, as illustrated in Figure 20 below. The User can also press the ESC key to go back to the Main Screen.

The screen will list the tests that can be performed for each selected device type. At least one test must be selected so the application can run the diagnostic. After the user chooses which devices must be performed, the user can select the “Run Test” option by pressing the ENTER. It will start the diagnostic.

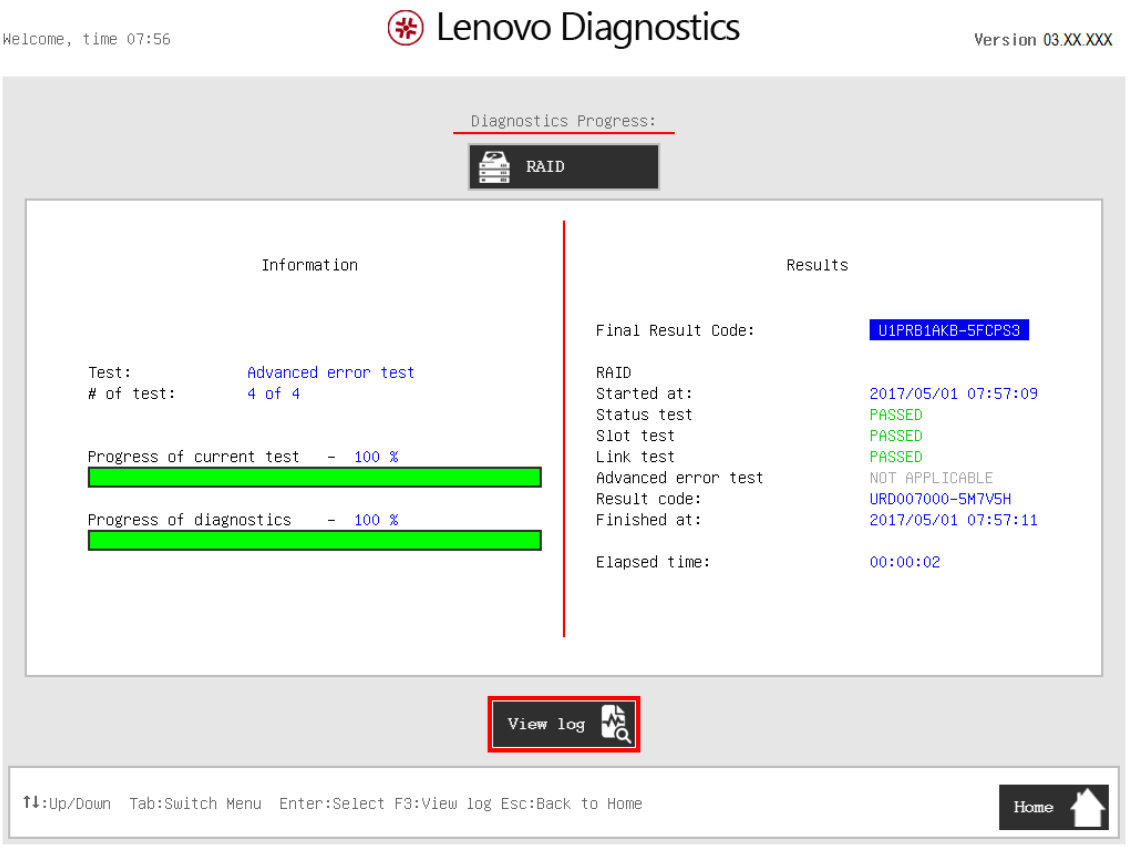


**Figure 18 - RAID test progress**

The Storage diagnostic progress screen provides information about the Storage progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Memory), Instruction Bar contains instructions to run the test. The Memory screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);
- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Storage Test

After the user selects “Storage” option, the application will display the number of storage devices available in the system. If there is more than one storage device installed, the menu “Select Device” is displayed, as shown in Figure 19.

This screen has also an option where user can view the devices details. To access this feature user has to highlight the device that wants to see details and press F1 key, it will open a popup on screen with device details, as shown in Figure 20.


**Figure 19 - Select Devices Screen**


**Figure 20 - Select Devices Screen popup details**

The currently selected option has a “x” in front of the option. To run selected option user has to press the ENTER key on button “Next”. After that, the system will show a list of tests, as illustrated in Figure 19 above, and all the tests are initially selected to be tested (‘X’ between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the “Select/deselect all option” is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the “Select/deselect all option” again, all tests options will also be selected again.

At least one device must be selected so the application can run the diagnostic. After the user chooses which devices must be performed, the user can select the “Next” option by pressing the ENTER

key. The system will show the screen where user can select the tests wants to performed for selected devices.

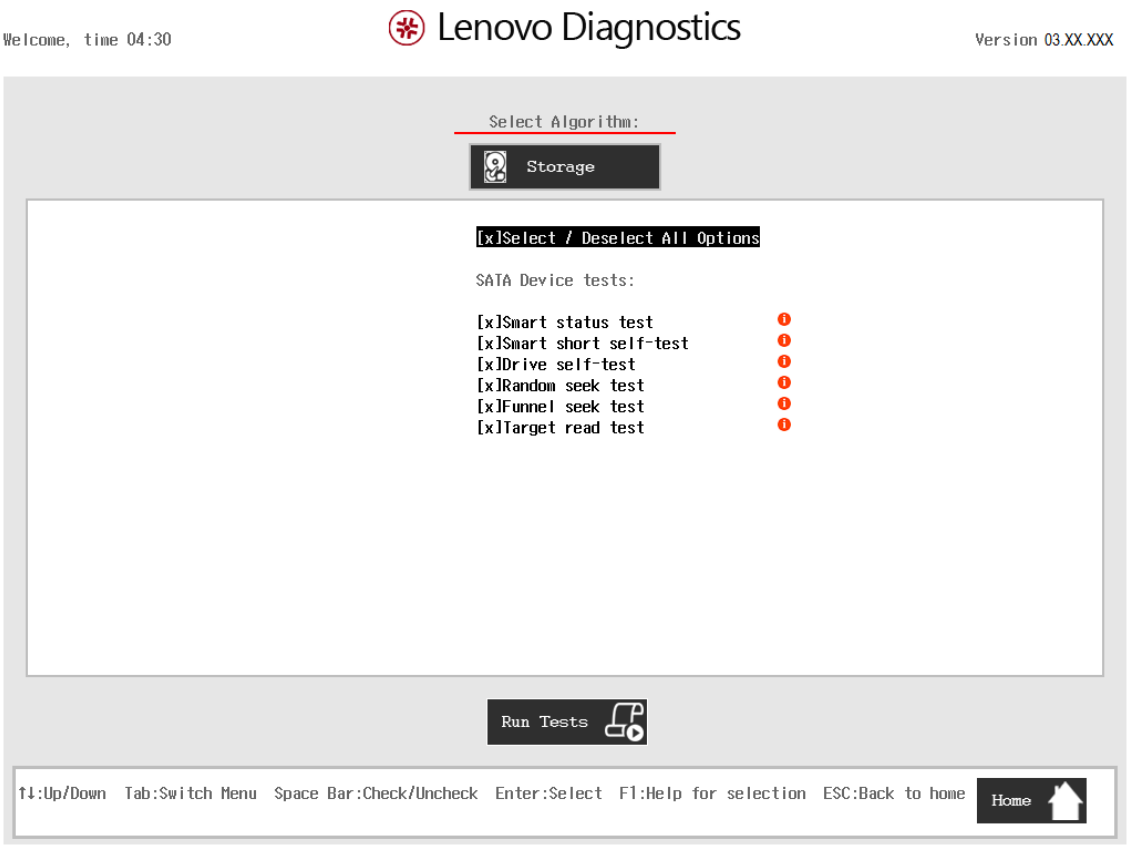


**Figure 21 - Select Tests Screen**

The screen will list the tests that can be performed for each selected device type. The On example displayed on Figure 21, it is possible to see that user selected a “SATA” device type, so the tests that can be performed for each device as listed below them.

At least one test must be selected so the application can run the diagnostic. After the user chooses which devices must be tested, the user can select the “Run Test” option by pressing the ENTER. It will start the diagnostic.

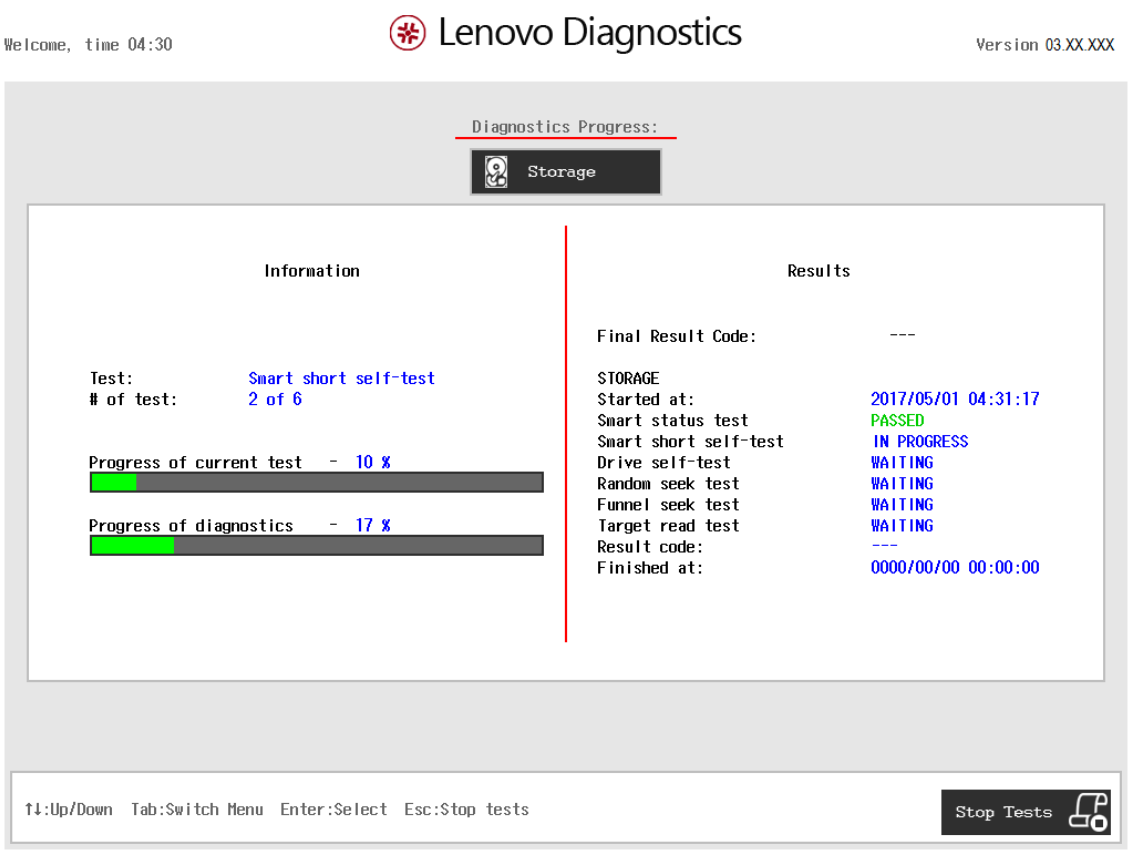


**Figure 22 – Storage Test Screen**

The Storage diagnostic progress screen provides information about the Storage progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Storage), Instruction Bar contains instructions to run the test. The Storage screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);

- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Optical Device Test

The system allows the user to access the Memory Extended Diagnostic from the Main screen -> Diagnostics -> Memory.

The currently selected option has a “x” in front of the option. To access the Memory Extended Test diagnostic on screen, the user can press the UP/DOWN arrow keys until the "CPU quick test" and press SPACE Key to select it.

To run selected option user has to press the ENTER key on button “Next”. After that, the system will show a list of tests, as illustrated in Figure 23 below, and all the tests are initially selected to be tested (‘X’ between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the “Select/deselect all option” is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the “Select/deselect all option” again, all tests options will also be selected again.


**Figure 23 - Select Algorithm Screen**

At least one test must be selected so the application can run the diagnostic. After the user chooses which tests must be performed, the user can select the “Run Tests” option by pressing the ENTER key. The system will run all tests, as illustrated in Figure 25 above. The user can also press the ESC key to go back to the Main Screen.

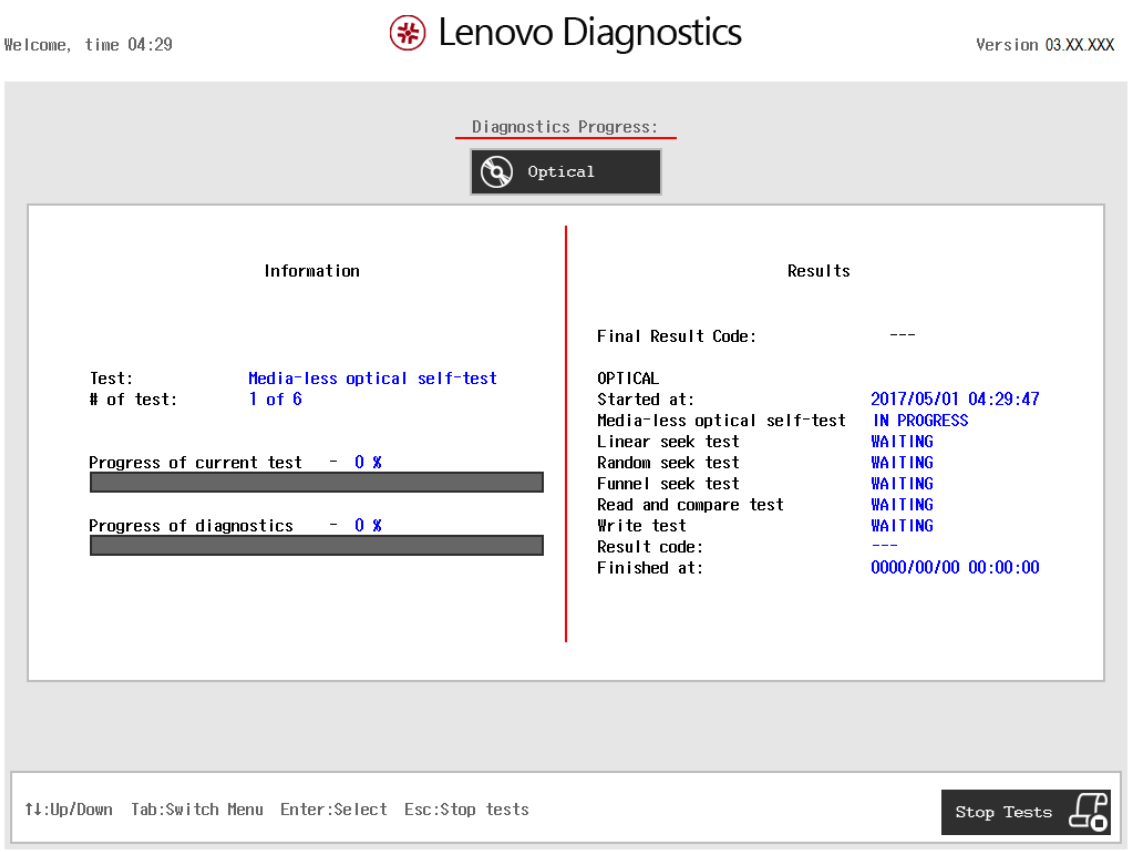


**Figure 24 - Optical Device Test screen**

The Optical diagnostic progress screen provides information about the optical progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Optical), Instruction Bar contains instructions to run the test. The Optical screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);

- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Video Card test

The Video Card test is not available to end user, but it's possible to access it from ShellView version. User has to type the command on shellview and the test is started. User will know the result of the test on log generated by application after test diagnostic is finished.

## Run All Tests

The system allows the user to access the Run all test diagnostic from the Main screen.

The currently selected option has a "x" in front of the option. To select the type of test that user wants to run, can be used the UP/DOWN arrow keys to navigated until the desired item. User can press SPACE Key to select it, as illustrated in Figure 25 below

The system will show a list of tests, and all the tests are initially selected to be tested ('X' between brackets means the test is selected).

The user can deselect a selected test by pressing the SPACE key when test is highlighted. An empty space will appear between the brackets. To select a test again, the user can press the SPACE key again.

Initially, the "Select/deselect all option" is selected. If the user presses the SPACE key or ENTER key on that option, then all test options will be deselected. If the user selects the "Select/deselect all option" again, all tests options will also be selected again.

To run selected option user has to press the ENTER key on button "Run Tests".

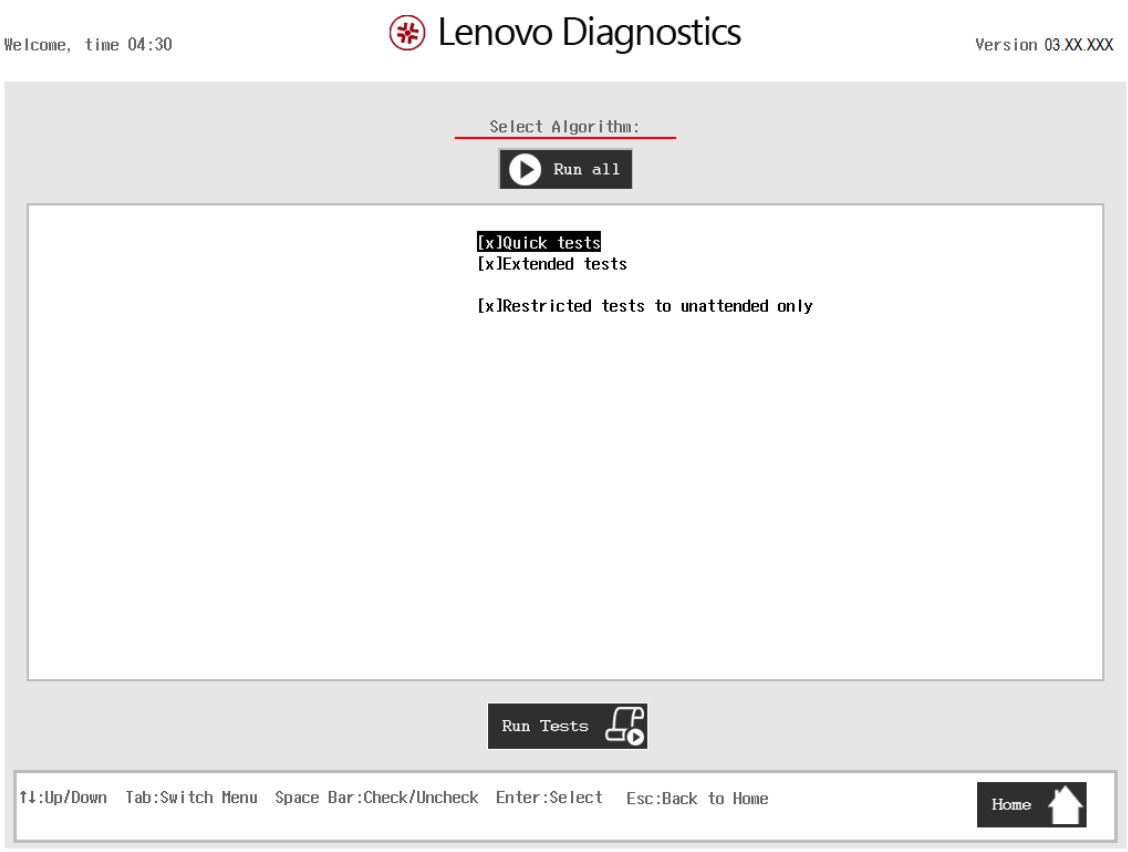


**Figure 25 – Run All test**

At least one test must be selected so the application can run the diagnostic. After the user chooses which tests must be performed, the user can select the "Run Tests" option by pressing the ENTER key. The system will run all tests, as illustrated in Figure 28 below. The user can also press the ESC key to go back to the Main Screen.

Run All is a test that runs all diagnostics included in the tool, such as CPU, LDC, Memory, Motherboard, Optical, PCI and Storage. The only choice the user has is: Quick, Extended or Restricted.

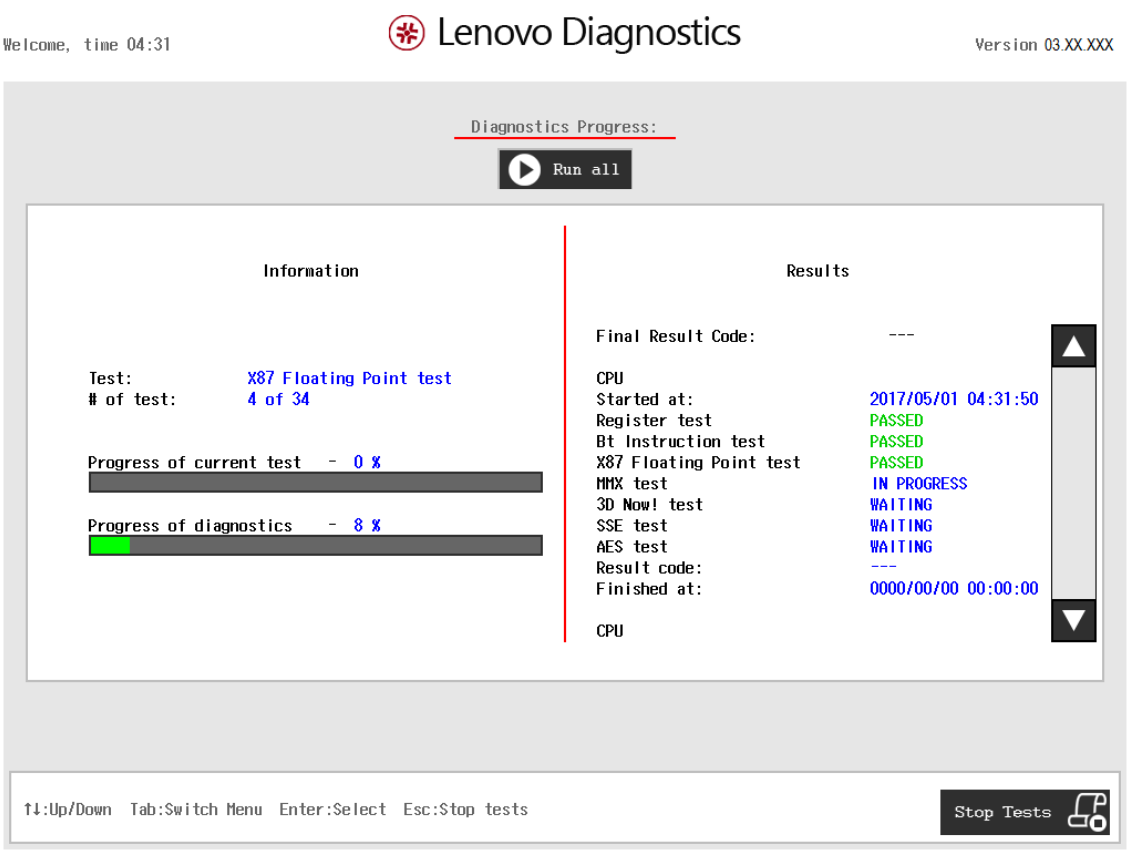


**Figure 26 – Run all test progress**

The Run all diagnostic progress screen provides information about the run all progress, as well as information about the results. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Two sections (Information and Results);
- Instruction Bar;

Application Title Bar contains the name of the application, Screen Title Bar contains the name of screen (in the case, Optical), Instruction Bar contains instructions to run the test. The Optical screen has also two main sections: Information and Results. The first section provides information about the test and diagnostic progress, and the second section provides information about the results of the test and the test algorithms.

The information section contains the following information:

- Test (name of test being currently run);

- # of Test (number of the current test among all tests to be run);
- Progress of current test (bar with progress in percentage of current test);
- Progress of diagnostic (bar with progress in percentage of all diagnostic, with its entire test).

The Results section contains the following information:

- Final Result Code: (an encrypted code that informs which modules were tested);
- Date and time that test has started;
- A list with all the algorithms which compose device test and their respective status (an algorithm can have six status:
    - WAITING, indicating test is waiting to be run;
    - IN PROGRESS, indicating test is being run;
    - PASSED, indicating algorithm has found no problems at device;
    - FAILED, indicating that algorithm has found one or more faults at algorithm;
    - CANCELED, indicating algorithm was canceled by user;
    - NOT APPLICABLE, indicating algorithm is not supported by device),
- Result Code for test:
- Date and time that the tests are finished (displayed after test is finished);
- Elapsed time, that is a duration of test in hours, minutes and seconds (displayed after test is finished).

While the diagnostic is running, the user can stop it at any time by pressing the ESC key. If the user does that, the diagnostic is aborted and the status of the test that is being run is changed to CANCELED. After the diagnostic is finished or canceled, the user can go back to the Main Screen (by pressing ESC key again) or see the test log (by pressing the F3 key).

## Log Screen

After a test or a recover operation is finished or canceled, the user can see the “Log Screen” by pressing the ‘L’ key. The “Log Screen” for Memory Test is shown in Figure 27.

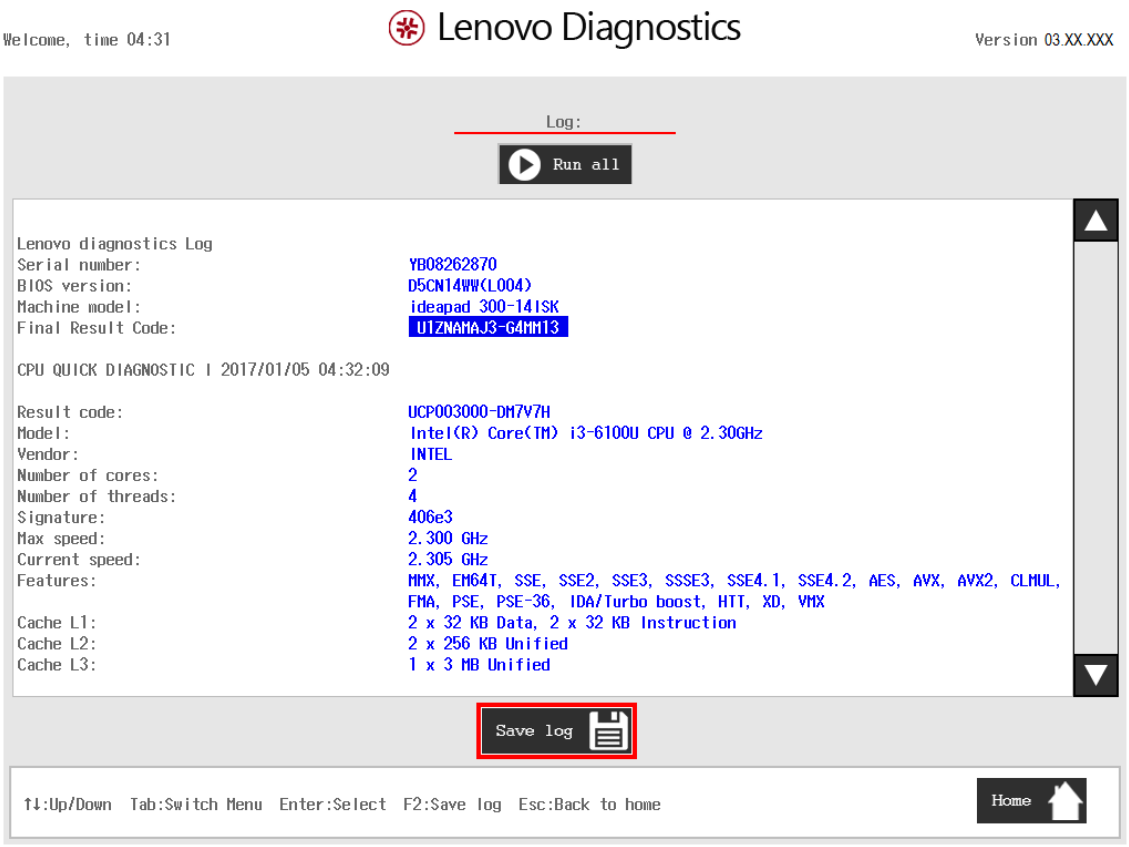


**Figure 27 - Log Screen for Quick Memory Test**

“Log Screen” is composed of:

- Application Title Bar;
- Screen Title Bar;
- Instruction Bar;
- Log Content Region;
- Scroll Bar.

The Application Title Bar contains the name of the application;

Screen Title Bar contains name of screen (in the case, Log Screen);

Instruction Bar contains instructions to use screen and current time;

Log Content Region shows log content;

Scroll Bar shows which portion of all log is displayed at Log Content Region.

If the log content has more rows than screen, the user can scroll by pressing the Up and Down arrow keys to move the displayed region up and down, respectively. The user can also go back to the Main Screen by pressing the 'ESC' key and save the log by pressing the "F2" key.

## Save Log Window

If the user chooses to save the log by pressing the "F2" key on the "Log Screen", the "Save Log" window is displayed, as shown in Figure 28.

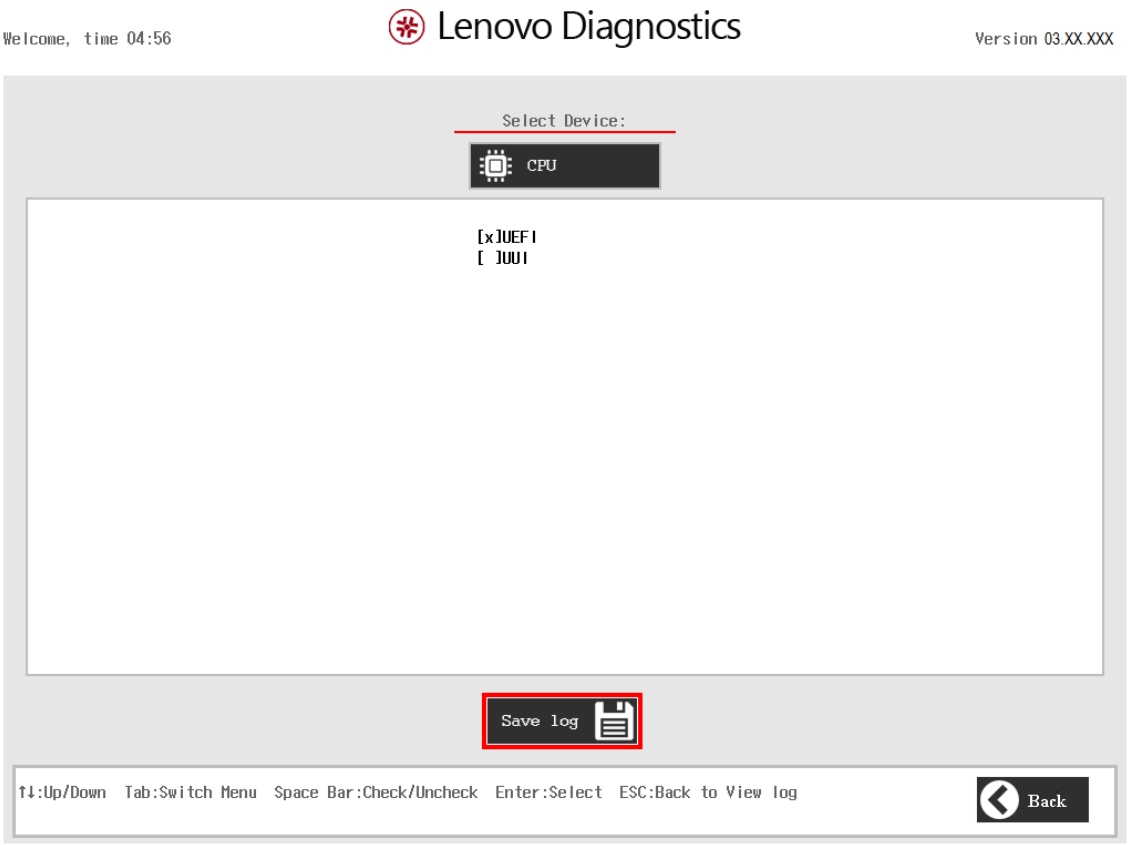


**Figure 28- Save Log Window**

The “Save Log” window is composed of:

- Window Title Bar;
- Saving Options List;
- Cancel Option.

The Window Title Bar contains the name of the window (in this case, Save Log);

The Save Log List shows all devices where the log can be saved;

Cancel Option is used to perform a cancel operation.

The currently selected option is highlighted in black. The user can change the selected option by pressing the up and down arrow keys. The user can choose which device to save the log in. After the user chooses a device, the user can press ENTER. The application will attempt to save the log on the selected device.

If the saving operation is successful, a window will be displayed to inform the user that the operation was successful (as shown in Figure 29). If the operation does not work, a window will be displayed to inform the user that the operation was not successful. In both cases, the user must press ENTER, and the “Log Test” screen will be displayed again.

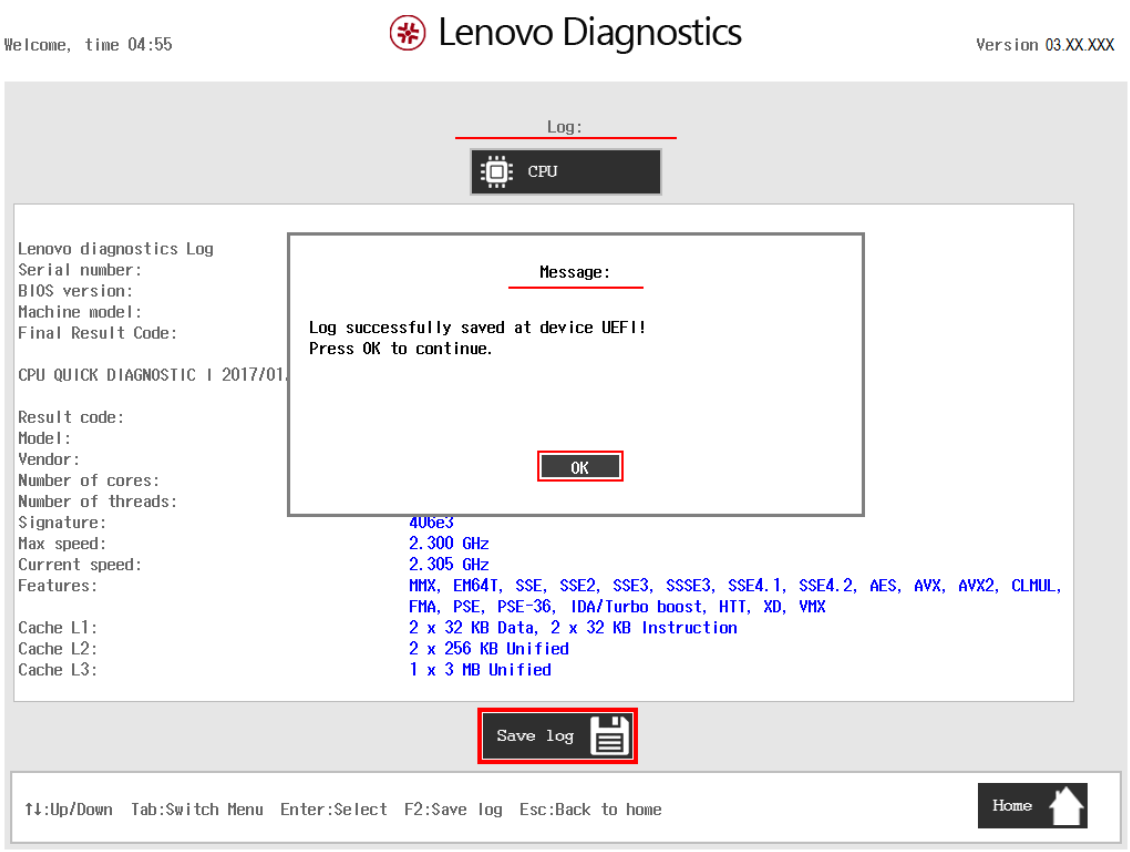


**Figure 29 - Log saving operation was successful**

## System Information

The System Information Screen with System tab selected is shown in Figure 30.

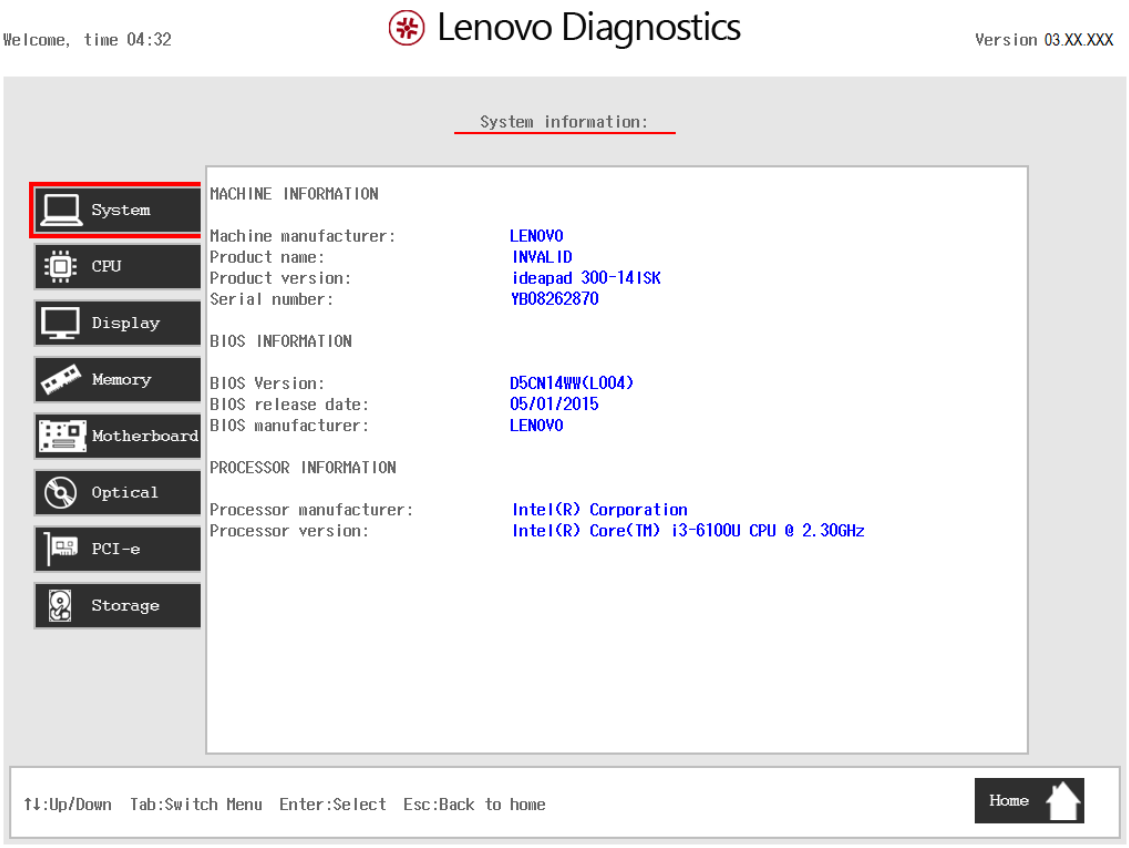


**Figure 30 - System Information Screen – System Tab**

System Information Screen with CPU tab selected is shown in Figure 31.

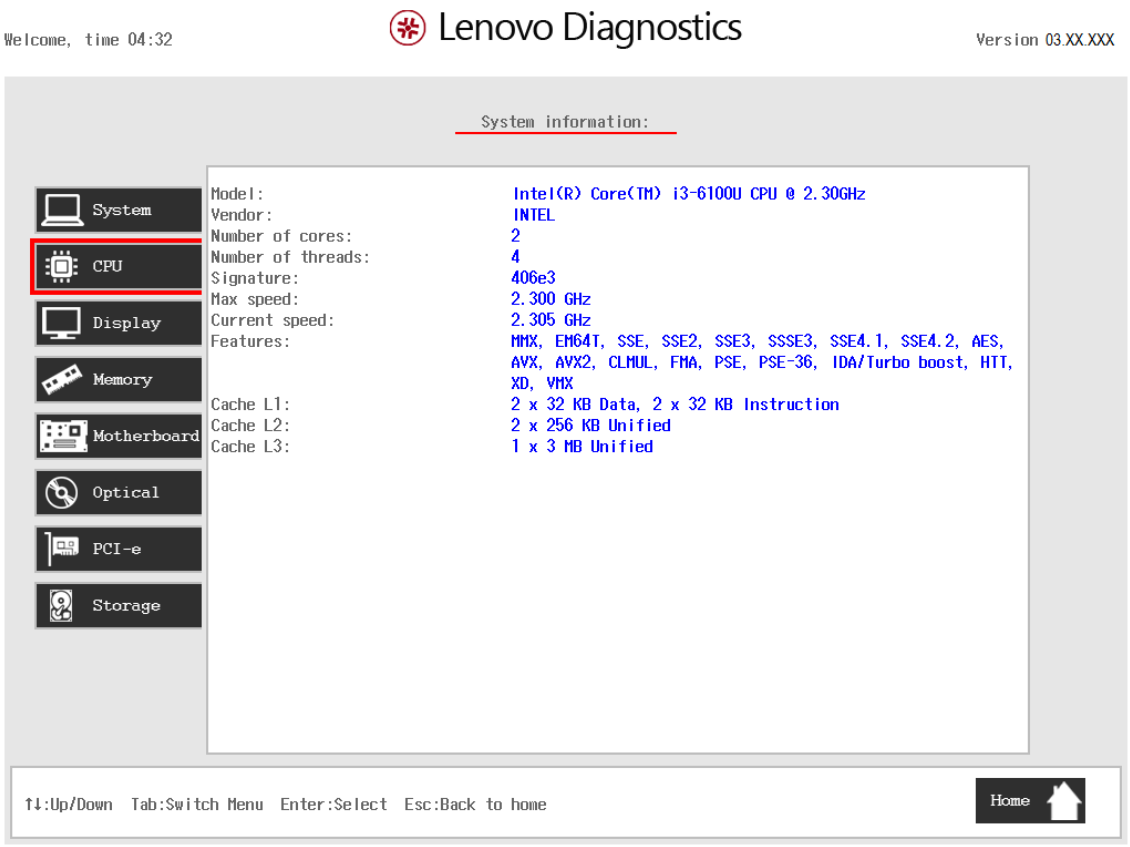


**Figure 31 - System Information Screen – CPU Tab**

System Information Screen with Display tab selected is showed at Figure 32.

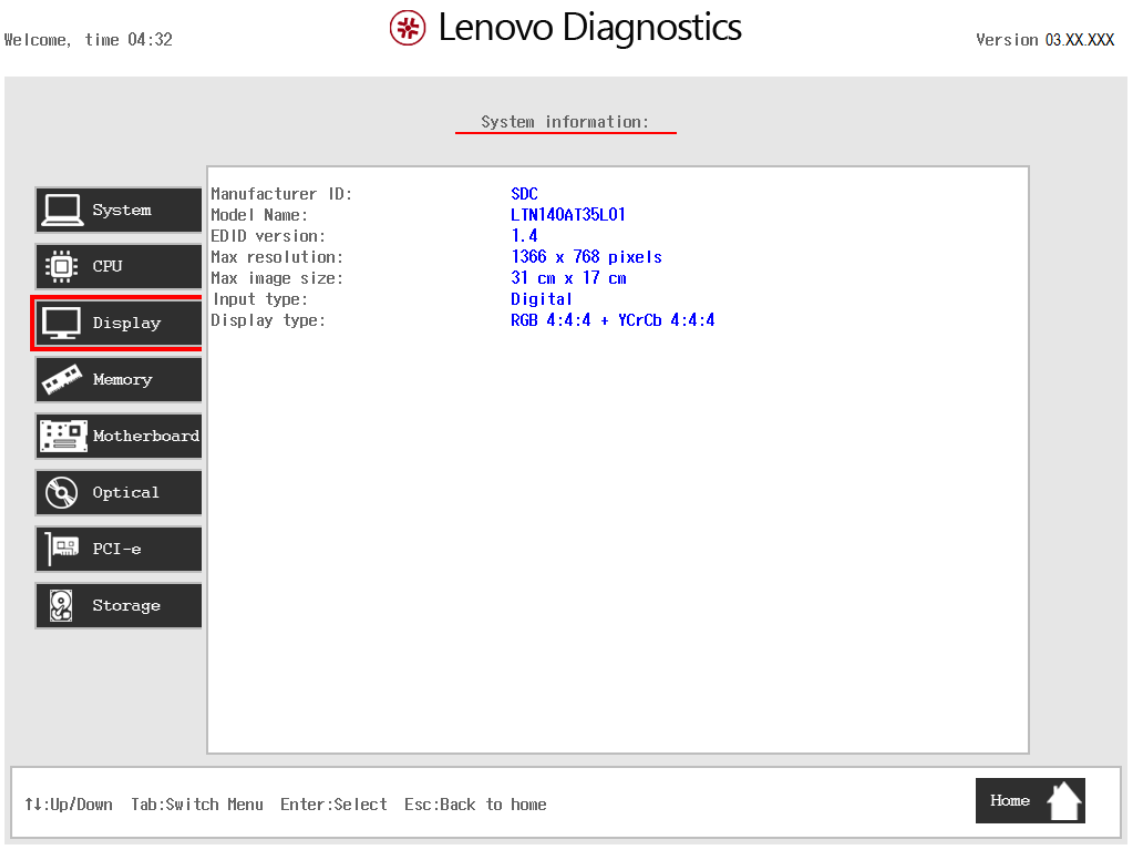


**Figure 32 - System Information Screen – Display Tab**

The System Information Screen with Memory tab selected is shown in Figure 33.

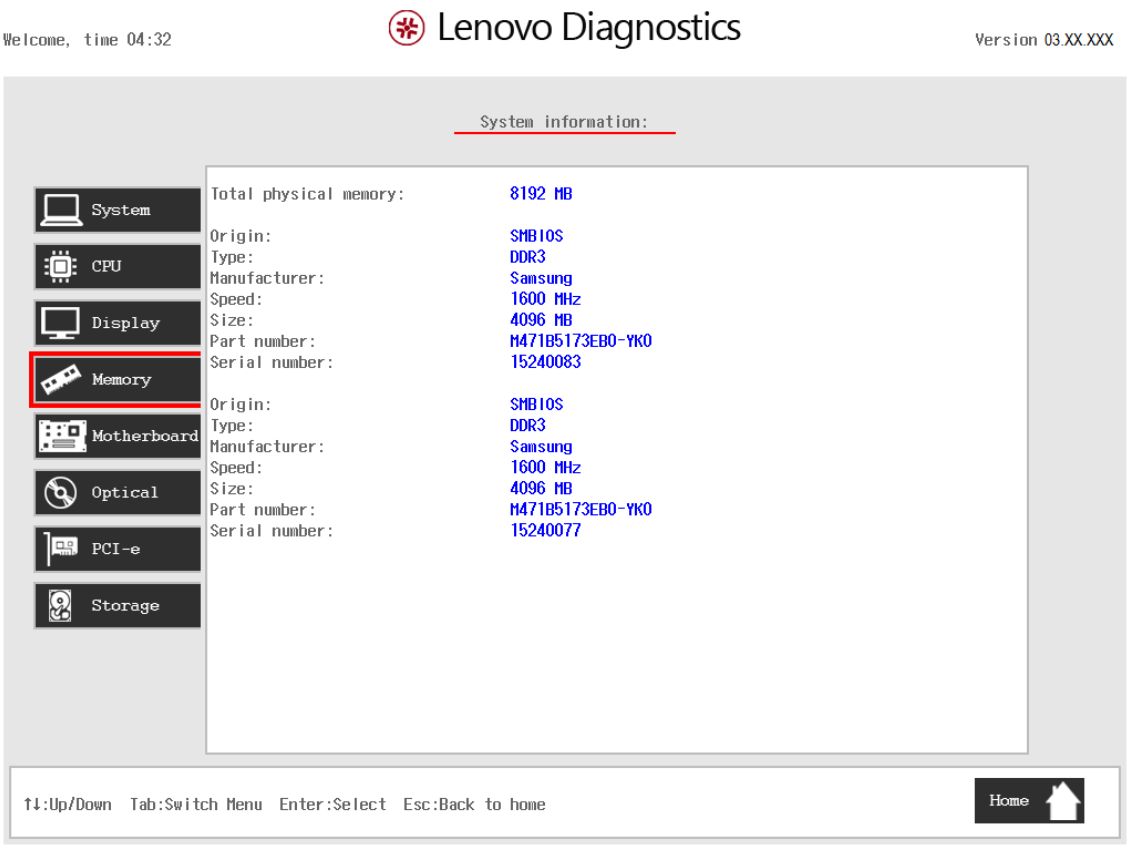


**Figure 33 - System Information Screen – Memory Tab**

System Information Screen with Motherboard tab selected is shown in Figure 34.

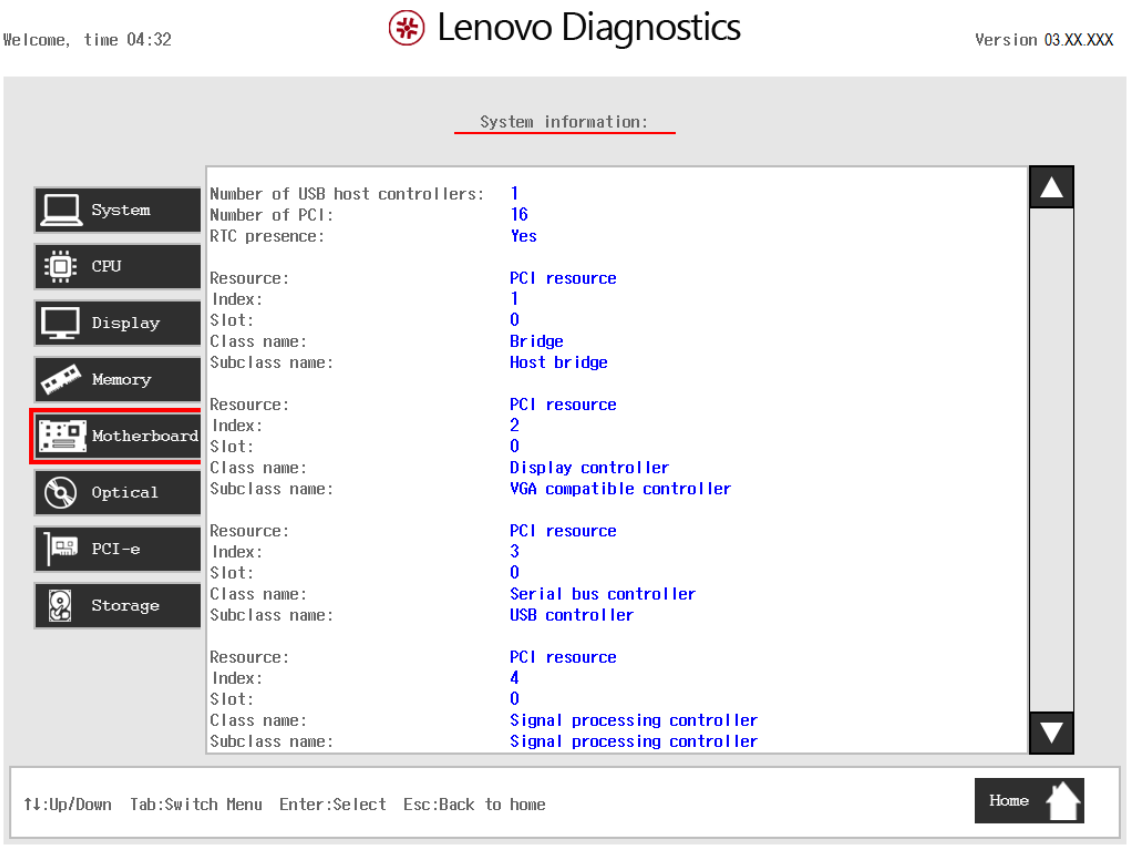


**Figure 34 - System Information Screen – Motherboard Tab**

System Information Screen with Optical Device tab selected is shown in Figure 35.

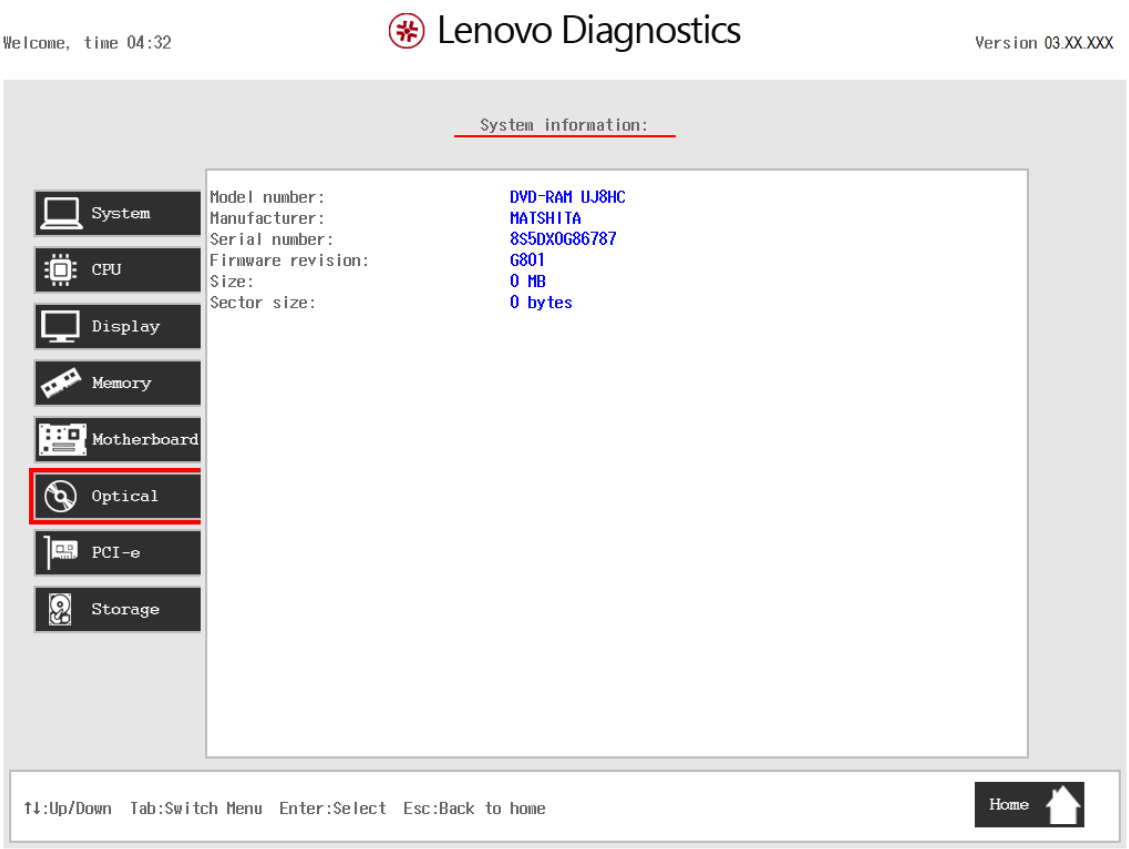


**Figure 35 - System Information Screen – Optical Device Tab**

System Information Screen with PCI Express tab selected is shown in Figure 36.

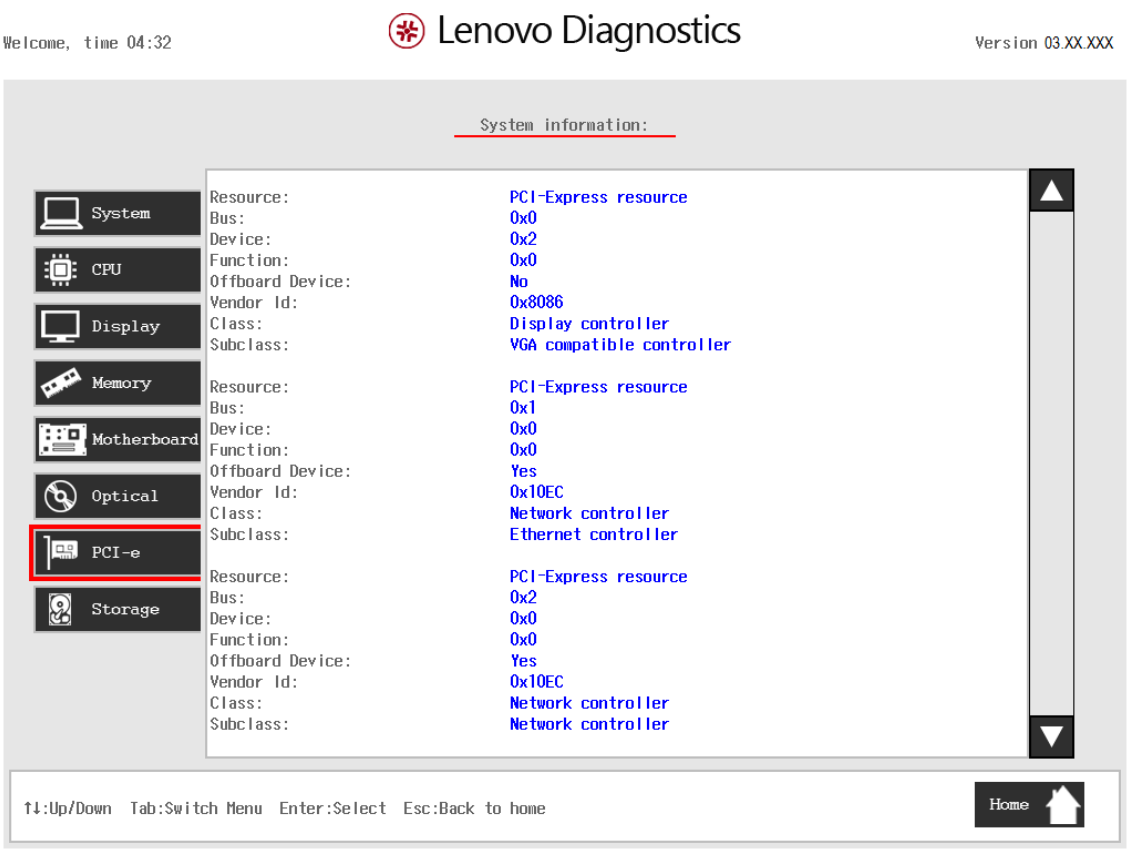


**Figure 36 - System Information Screen – PCI Express Tab**

The System Information Screen with the Storage tab selected is shown in Figure 37.

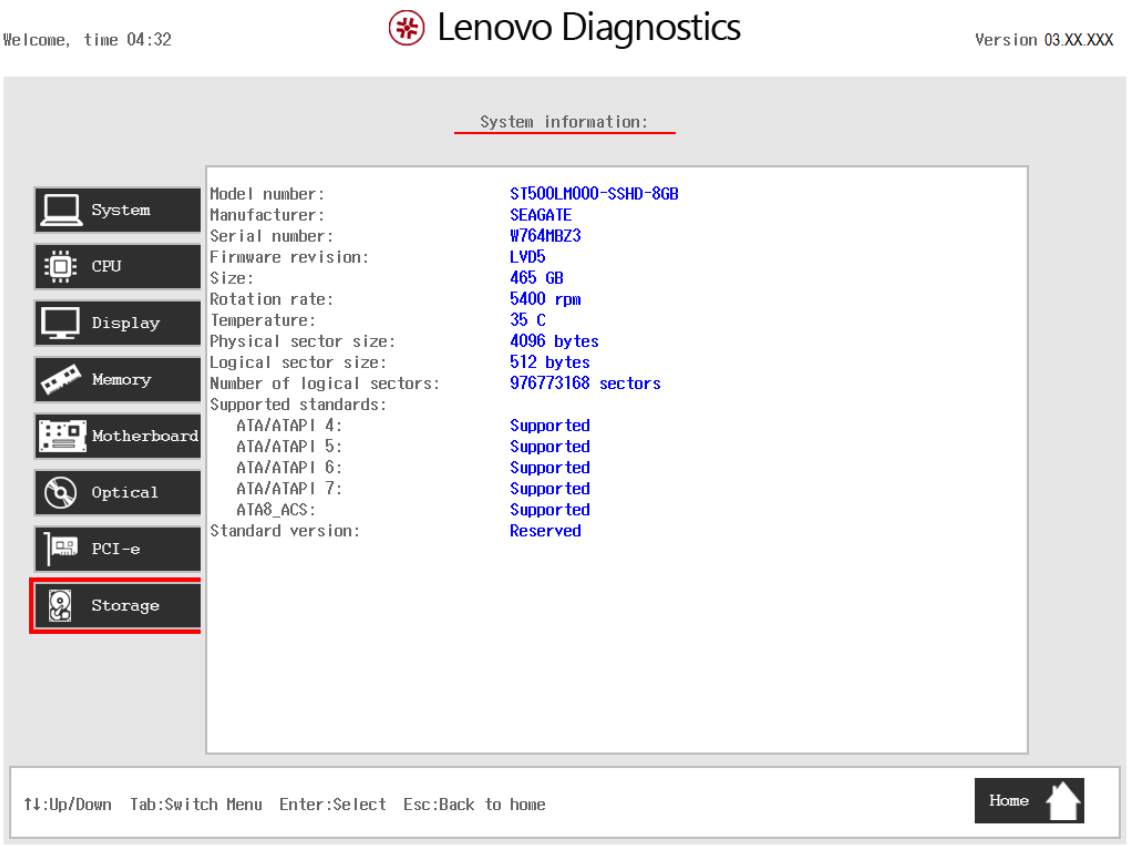


**Figure 37 - System Information Screen – Storage Tab**

The System Information Screen is displayed after the user runs the option "System Information" on the Main Screen. The System Information Screen provides detailed information about the machine, the memory devices, and the storage devices. This screen is composed of:

- Application Title Bar;
- Screen Title Bar;
- Tab Names Bar;
- Tab Content Region;
- Instruction Bar

The Application Title Bar contains the name of the application;

The Screen Title Bar contains the name of the screen (in this case, System Information);

The Instruction Bar contains instructions to manage the screen;

The Tab Name Bar contains the name of all the available tabs and displays the tab currently selected (the name of current tab has a blue background to differentiate it from the other tabs);

The Tab Content Region contains information corresponding to tab currently selected;

User can change the current tab by pressing the Left and Right arrow keys. The Tab Content Region will display information about device on the current tab. User can also scroll information content using the Up and Down arrow keys if the number of content rows is greater than the number of rows on the screen.

For the ***System tab***, the following information is displayed in the Tab Content Region:

- Machine Manufacturer;
- Product Name;
- Product Version;
- Serial Number;
- BIOS Revision;
- BIOS Release Date;
- BIOS Manufacturer;
- Processor Manufacturer;
- Processor Version.

For the ***CPU tab***, the following information is displayed in the Tab Content Region:

- Model;
- Vendor;
- Number of cores;
- Number of threads;
- Signature;

- Max speed;
- Current speed;
- Features;
- Cache L1;
- Cache L2;
- Cache L3.

For the ***Display tab***, the following information is displayed in the Tab Content Region:

- Manufacturer ID (a three-letter code identifying the manufacturer);
- Model Name;
- Date of Manufacture;
- EDID Version;
- Max resolution (in pixels);
- Max Image Size (in cm);
- Input Type (analog or digital); and
- Display Type.

For the ***Fan tab***, the following information is displayed in the Tab Content Region:

- CPU fan speed;
- CPU temperature;

For the ***Memory tab***, the following information is displayed in the Tab Content Region:

- Total Physical Memory (total of physical memory of machine in Gigabytes) and, for each memory device installed on machine:
  - Identification of memory device (Origin);
  - Type of memory (DDR2, DDR3, EEPROM and so on);
  - Memory Manufacturer;

- Speed of memory (in MHz);
- Memory size (in Gigabytes);
- Memory Part Number;
- Memory Serial Number.

For the ***Motherboard tab***, the following information is displayed in the Tab Content Region:

- Number of USB host controllers;
- Number of PCI;
- RTC presence;
- Resource:
- Index;
- Slot;
- Class name;
- Subclass name;

For the ***Optical tab***, the following information is displayed in the Tab Content Region:

- Manufacturer;
- Model number;
- Serial number;
- Firmware revision;
- Size;
- Sector size;
- Supported features.

For the ***PCI-e tab***, the following information is displayed in the Tab Content Region:

- Resource
- Bus (current item bus hexadecimal id);
- Device (current item device hexadecimal id);
- Function (current item function hexadecimal id);
- Device Connected (in case it's an external PCI Express off board connected)
- Vendor ID (current item vendor hexadecimal id)
- Class (current item class name)
- Subclass (current item subclass name)

For the ***Storage tab***, the following information is displayed in the Tab Content Region:

- Model number
- Manufacturer;
- Serial Number;
- Firmware Revision;
- Size (in GB);
- Rotation rate;
- Temperature (in Celsius);
- Physical Sector Size (in bytes);
- Logical Sector Size (in bytes);
- Number of logical sectors;
- Supported Standards;
  - ATA/ATAPI 4:
  - ATA/ATAPI 5:
  - ATA/ATAPI 6:
  - ATA/ATAPI 7:
- Standard version;

To exit the System Information Screen and go back to the Main Screen, the user must press the “ESC” key.

## Recover Bad Sectors Tool Screen

Recover bad sectors is a tool that allows user to perform a test on system storages, identifying bad slots and allows user to recover these found bad blocks. When user selects this option on Main screen it displays two options to user.

- Check bad sector: this option makes a test on system storages and list the found bad blocks.
- Check and recover bad sector: this option makes a test on system storages list them to user and starts to correct the found bad blocks.


**Figure 38 - Select Device Screen for Repair Bad Sectors Tool**

When one of the options above are selected the application computes the number of storage devices installed on the system. If there is more than one storage device installed on the system, “Select Devices” is displayed.

The Select Device screen for the Repair Bad Sectors Tool is very similar to the Select Device Screen for Storage Device Test. One difference is that, for the Storage Device Test, the user can choose more than one device to be tested. For the Recover Bad Sectors Tool, the user can select only one device to be recovered.

Initially, only one device is selected. If the user selects another device, this device is selected and the device selected previously is deselected.

Another difference is that the Select Device screen for the Recover Bad Sectors Tools does not have a “Select/deselect all” option.

For the Recover Bad Sectors Tool, the user can only select one operation to be run.

Initially, only one operation is selected. If the user selects another operation, this operation is selected and the operation selected previously is deselected.

Another difference is that the Select Algorithm screen for the Recover Bad Sectors Tools does not have a “Select/deselect all” option.

Initially, the selected operation is “Check Bad Sectors”. This operation checks all Storage Device’s sectors looking for bad sectors. The other selectable operation is “Check and Recover Bad Sectors” (to check all sectors and recover found bad sectors).

IMPORTANT: The “Check and Recover Bad Sectors” operation performs write operations on a device, which may cause data loss. The user must make a backup of his data before running that operation.

If the user selects the “Check Bad Sectors” operation, a pop-up window will appear as shown in Figure 39.

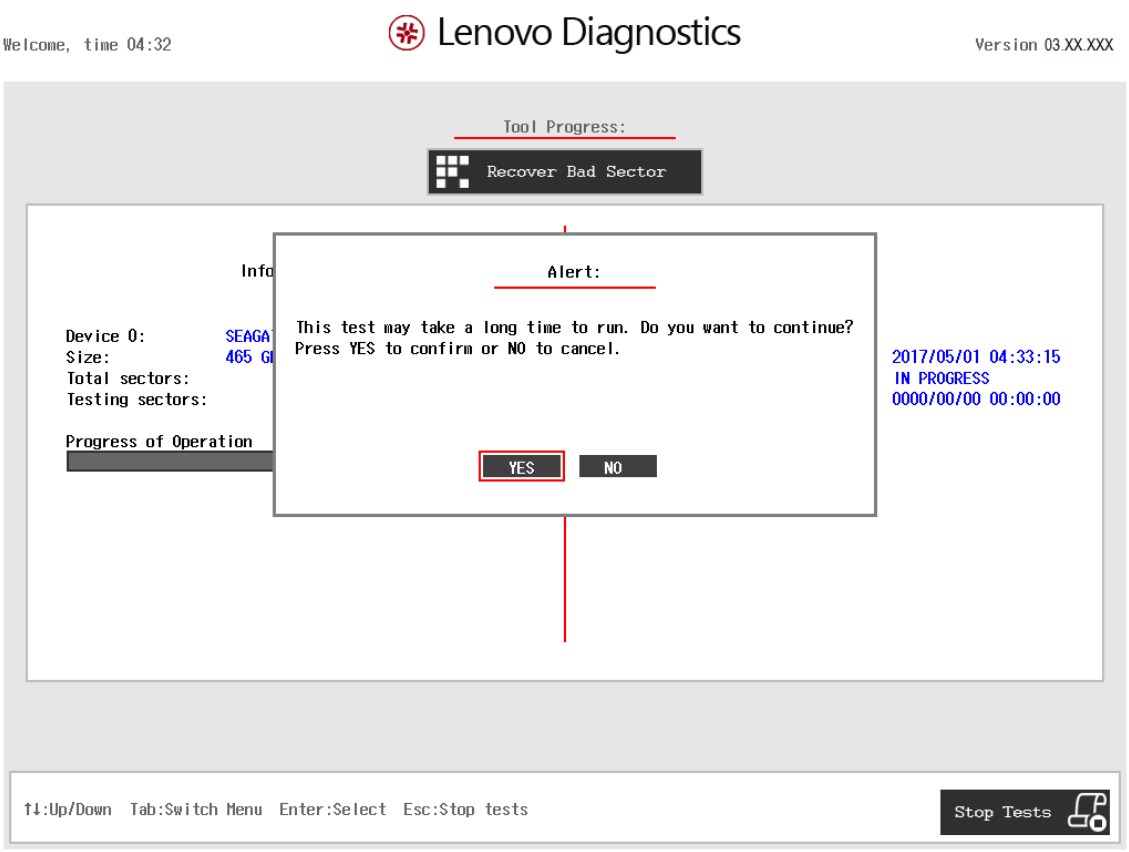


**Figure 39 - Check Bad Sectors pop-up window**

This pop-up window tells the user that this operation will take more than one hour to be finished and asks if the user wants to continue. To continue, the user must press the 'Y' key. If the user doesn't want to continue, the user must press the 'N' key.

If the user selects the "Check and Recover Bad Sectors" operation, a pop-up window will appear as shown in Figure 40.

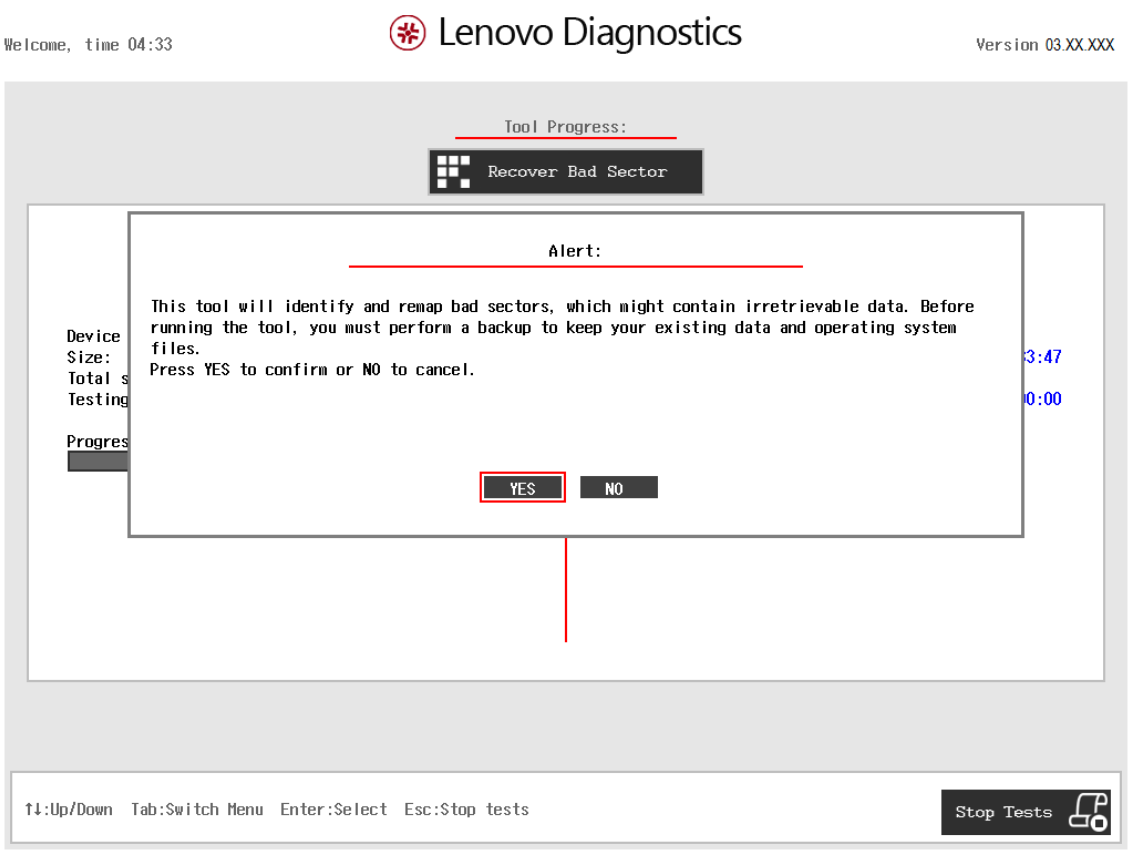


**Figure 40 - Check and Recover Bad Sectors pop-up window 1**

This pop-up window warms user that this operation may cause data loss on Storage Device. To continue, user must press 'Y' key. After that, another pop-up window will appear as shown at Figure 41. User can also abort operation pressing 'N' key.

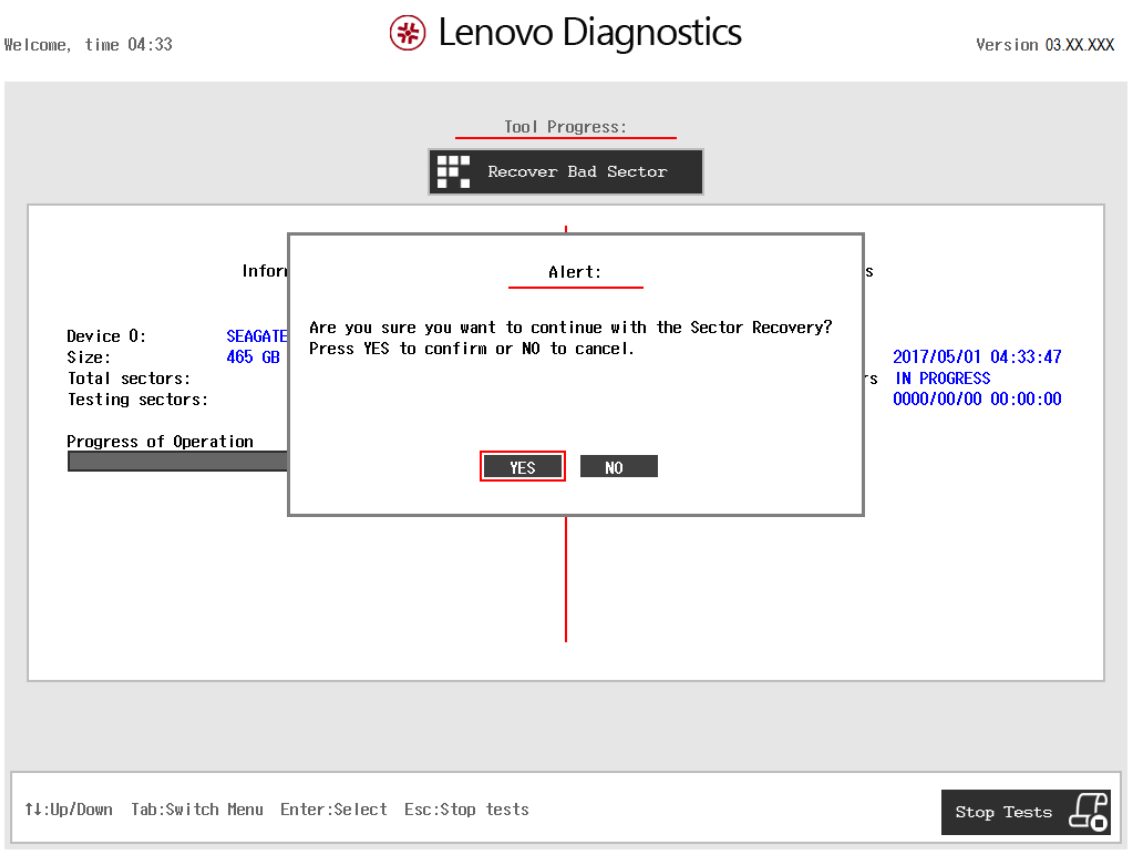


**Figure 41 - Check and Recover Bad Sectors pop-up window 2**

This pop-up window asks the user if the user really wants to continue this operation, due to the possibility of data loss. If the user wants to continue, the user must press the 'Y' key. If not, the user must press the 'N' key.

After all pop-up windows are closed, the Recover Bad Sectors Screen is displayed, as shown in Figure 42.

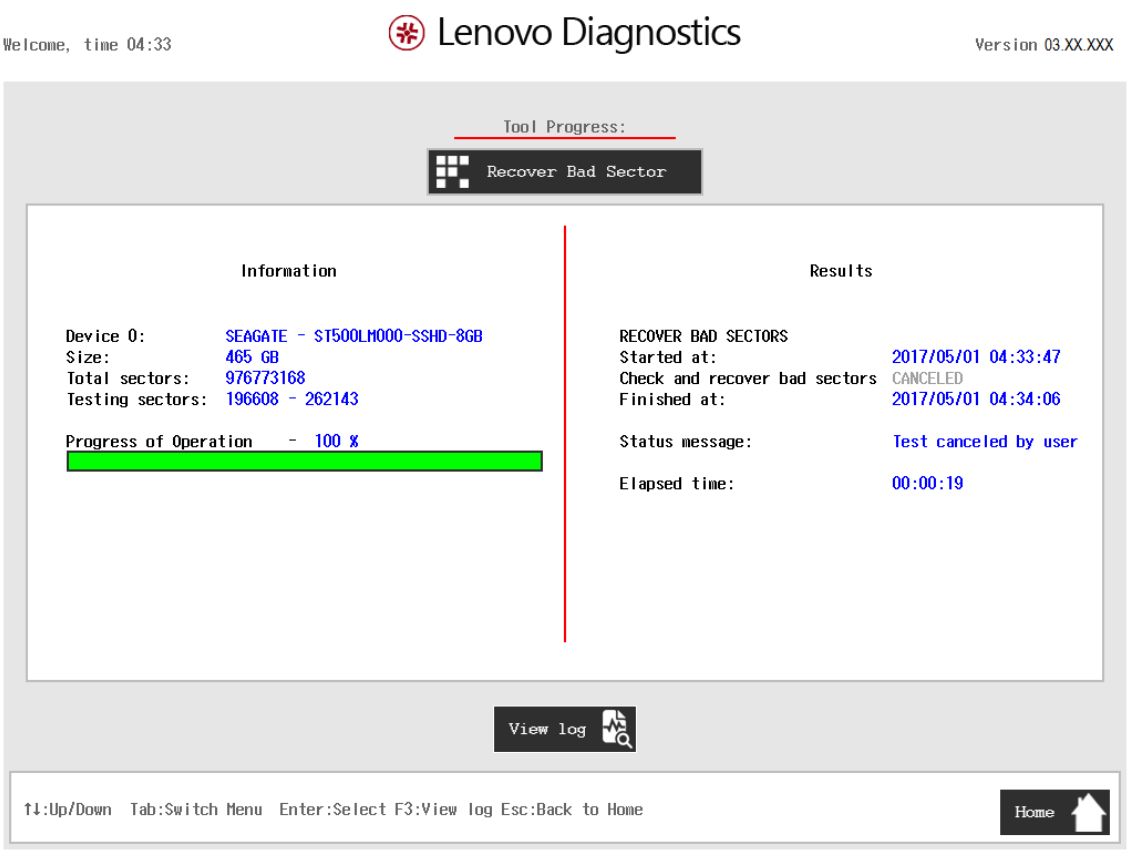


**Figure 42 - Recover Bad Sectors Tool Screen**

The Recover Bad Sectors screen is very similar to the Quick Storage Device Test Screen, with a few differences.

In the Recover Results section, besides test start time, test end time, duration of Recover and instructions to user after operation is finished, additional information is shown.

For the Check Bad Sectors operation, the found bad sectors are displayed on the screen. For the Check and Recover Bad Sectors operation, the found bad sectors and result of their recovery (i.e. if bad sectors could be recovered or not) are displayed on the screen.

The Recover Result section can be scrolled up or down using the Up and Down arrow keys if the number of content rows for this section is greater than the number of rows on the screen.

During execution of the Recovery operation, the user can stop it at any time by pressing the ESC key. If the user does that, the operation is aborted. After the operation is finished or aborted, the user can go back to the Main Screen by pressing the 'ESC' key again or the user can see the Repair Log Screen by pressing the 'F3' key.

## Exit Application

To exit the application, the user must select the option “Exit Application” on the Main Screen and press the ENTER key. Then, the interface will be closed and the machine will be reset.