Apple Service Diagnostic

User Guide

5.1

February, 2010

Scope

Apple Service Diagnostic tests the hardware for correct operation. Apple Service Diagnostic (EFI) performs low-level tests of hardware directly and does not require an operating system to run. Apple Service Diagnostic OS tests use an OS X operating system to perform tests.

Building the bootable USB drive
Refer to Creating a ASD USB Bootable Drive.pdf document.

Booting and using the Apple Service Diagnostic application

Before using Apple Service Diagnostic disconnect any Ethernet network, USB and Audio cables. Plug in the ASD USB drive.

With the USB drive plugged into a USB port restart the machine and hold down the option key as the computer boots up into the system picker. To run EFI tests select the ASD EFI drive icon and press return or select it with a mouse click. To run OS tests select theASD OS drive icon and press return or select it with a mouse click. For EFI tests the application will boot in 20-30 seconds. For OS tests the application will boot in 2-3 minutes. After running EFI or OS diagnostics press the Restart button to restart the Mac and hold down the option key to get back to the system picker or do nothing to get back to the normal boot drive.

Apple Service Diagnostic EFI User Interface

An alert box will be displayed if the user is attempting to use Apple Service Diagnostic on a system that is not supported by this application. Restart restarts the Macintosh and Shut Down will shut down the Macintosh.

There are two menus; an Apple icon for displaying the About box, and Hardware Profile for displaying the hardware components on this macintosh .

The about box displays the application's version and copyright information. Press OK button to dismiss this window.
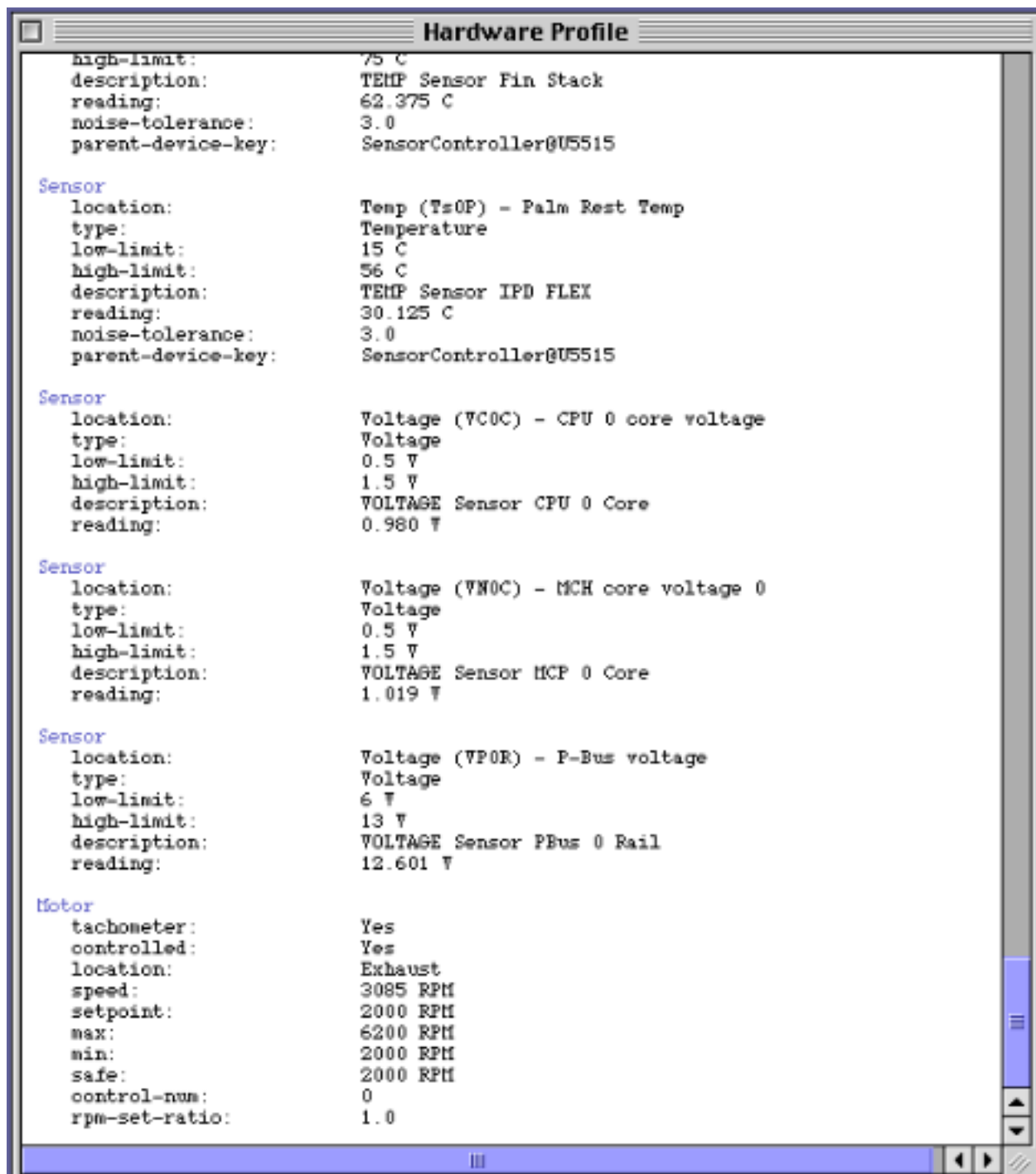

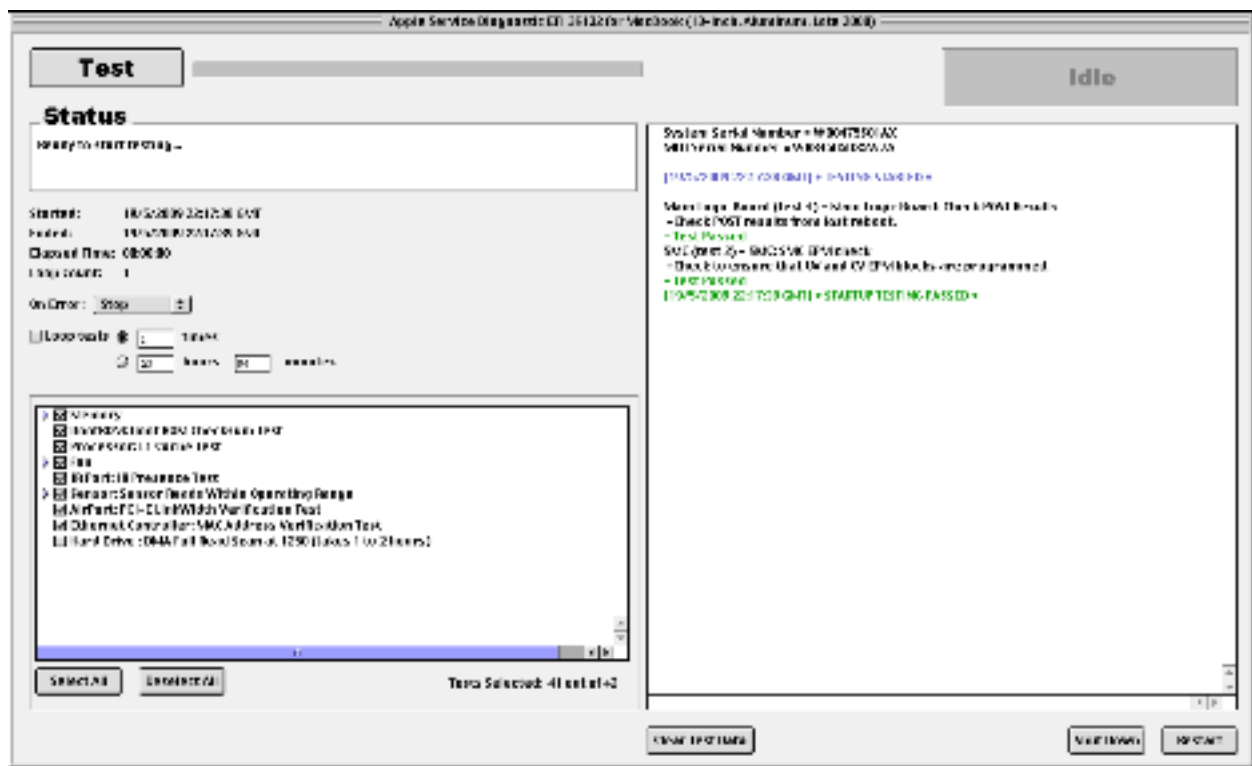## Hardware Profile

Hardware Profile menu

Hardware Profile displays the Macintosh's hardware components and their associated sub component values. Press the Close Box to dismiss this window.
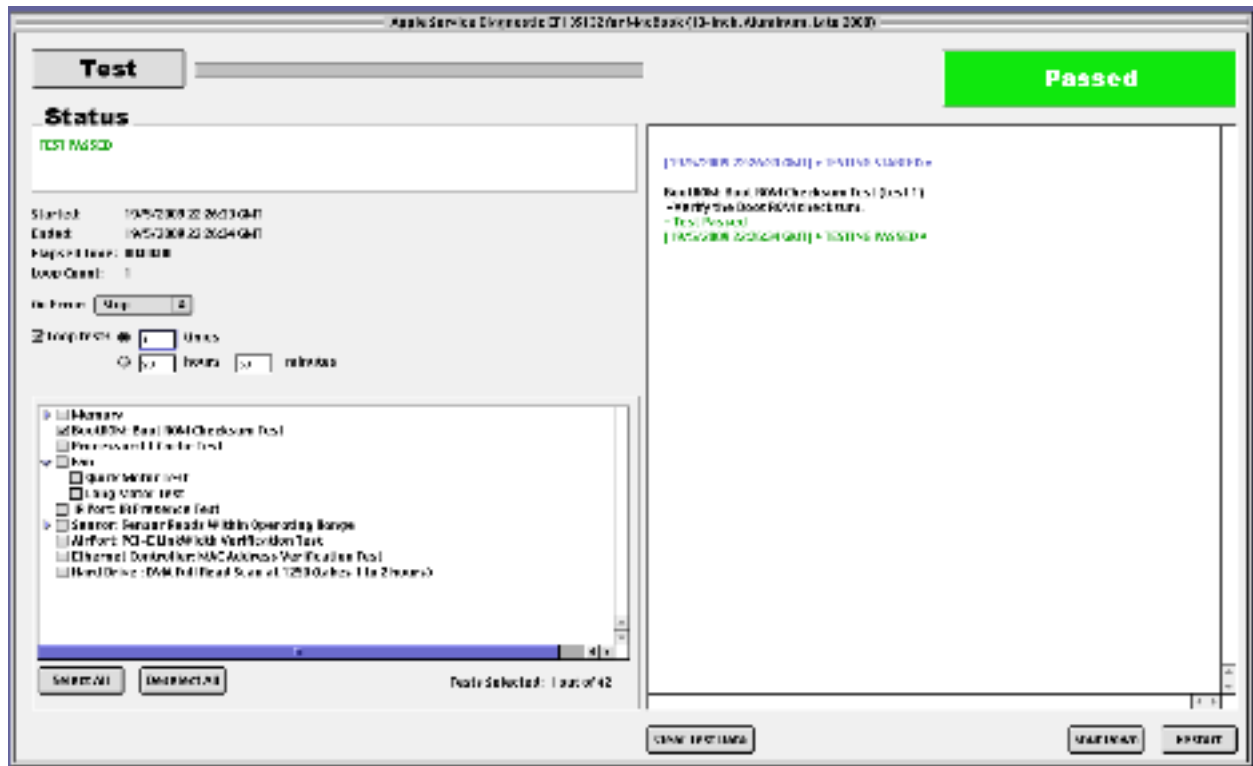
```
▣  ▤▤▤▤▤▤▤▤▤▤▤  Hardware Profile  ▤▤▤▤▤▤▤▤▤▤
    high-limit:           75 C
    description:          TEMP Sensor Fin Stack
    reading:              62.375 C
    noise-tolerance:      3.0
    parent-device-key:    SensorController@U5515

  Sensor
    location:             Temp (Ts0P) - Palm Rest Temp
    type:                 Temperature
    low-limit:            15 C
    high-limit:           56 C
    description:          TEMP Sensor IPD FLEX
    reading:              30.125 C
    noise-tolerance:      3.0
    parent-device-key:    SensorController@U5515

  Sensor
    location:             Voltage (VC0C) - CPU 0 core voltage
    type:                 Voltage
    low-limit:            0.5 V
    high-limit:           1.5 V
    description:          VOLTAGE Sensor CPU 0 Core
    reading:              0.980 V

  Sensor
    location:             Voltage (VN0C) - MCH core voltage 0
    type:                 Voltage
    low-limit:            0.5 V
    high-limit:           1.5 V
    description:          VOLTAGE Sensor MCP 0 Core
    reading:              1.019 V

  Sensor
    location:             Voltage (VP0R) - P-Bus voltage
    type:                 Voltage
    low-limit:            6 V
    high-limit:           13 V
    description:          VOLTAGE Sensor PBus 0 Rail
    reading:              12.601 V

  Motor
    tachometer:           Yes
    controlled:           Yes
    location:             Exhaust
    speed:                3085 RPM
    setpoint:             2000 RPM
    max:                  6200 RPM
    min:                  2000 RPM
    safe:                 2000 RPM
    control-num:          0
    rpm-set-ratio:        1.0
```

Application Interface

The Apple Service Diagnostic window is similar to the OS window. Status region displays current test infomation. Below thwe status window the start and stopped time, elapsed time, and number of loops and number of errors are displayed. With the test controls you can select the type of testing either by number of loops or time, maximum 23 hours and 59 minutes. Set test mode control to either stop on error or continue on error. Tests can be selected as desired. In the test selections window you can select each group of tests or by opening the disclosure triangle you can select specific tests. Select All selects all the tests and Deselect All deselects all tests. Upon startup the tests are set to a default set of tests. The status window in the upper right indicates testing status, Idle, Testing (blue with green Testing text), Passed (green with white Passed text), Failed (red with white text) or Stopped (blue with white text). The right window is the Test Log. The test log displays each test run and pass fail information. To clear the test log press the Clear Test Data button. To start testing press Test button the test progress bar is displayed next to the Test button. The total bar represents 100 percent of the selected test.. During testing the button Test name changes to Stop Testing. Pressing Stop Testing will abort testing. When finished testing press Shut Down to shut down or press Restart to restart the unit.

Testing Passed

If all tests passed the text "TESTING PASSED" is displayed.

Test Log

During testing the test log window will display current test information. Date, time, test name, test description, and test results when the test is finished.

```
                              TEST LOG

Current Sensor (IDOR) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Current Sensor (IGOC) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor - Camera test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor - MLB test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor - MLB test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor (TGOD) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor (THOP) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor (TOOP) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Temperature Sensor - LIO test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Voltage Sensor (VCOC) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Voltage Sensor (VDOR) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
Voltage Sensor (VGOC) test 1 - Sensor Reads Within Operating Range
 -Check to ensure that sensor reads within operating range.
 - Test Passed
AirPort test 1 - MAC Address Verification Test
 -Verifies the AirPort MAC address is not all 00s or all FFs.
 - Test Passed
Ethernet test 1 - MAC Address Verification Test
 -Verifies the Ethernet MAC address is not all 00s or all FFs.
 - Test Passed
[Mon Apr 17 2006 13:24] ● TESTING PASSED ●
```
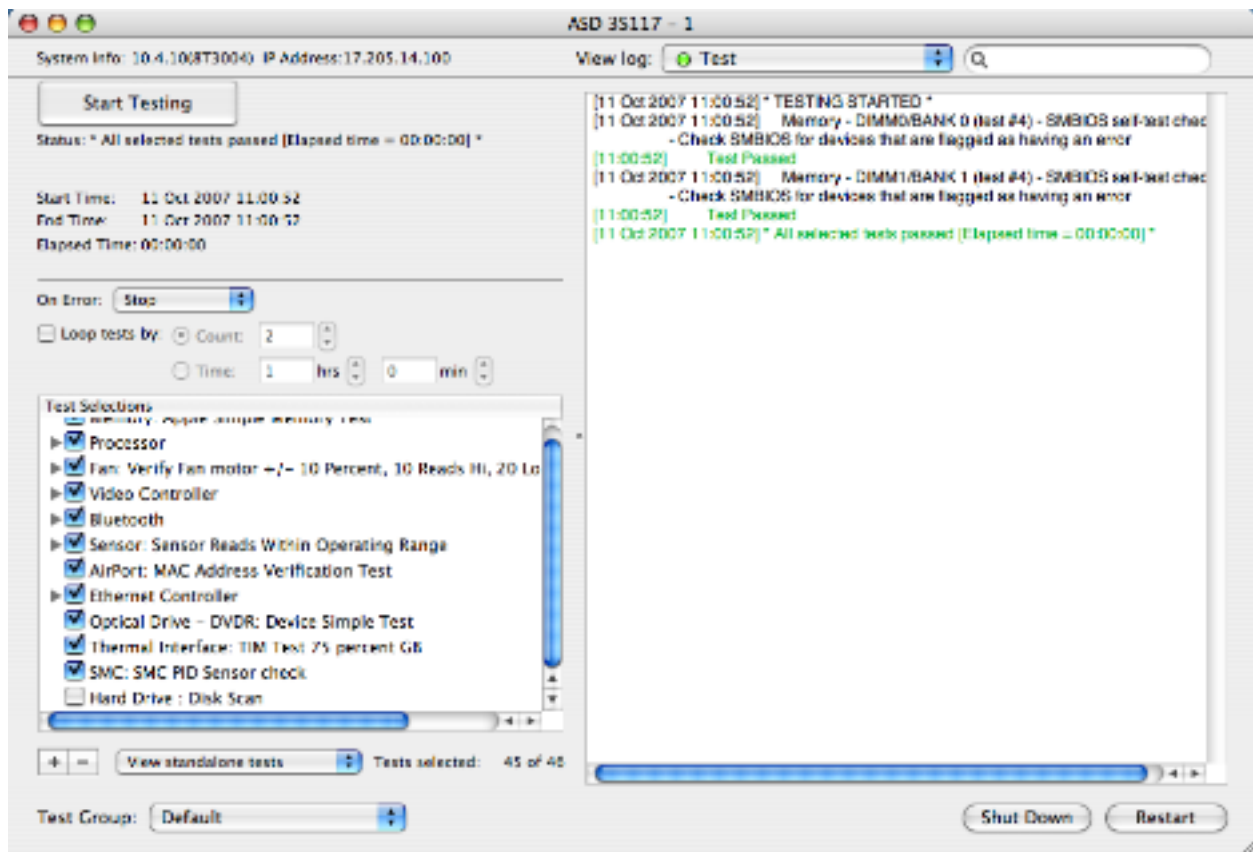
Apple Service Diagnostic OSX User Interface

Non Supported Machines

An alert box will be displayed if the user is attempting to use Apple Service Diagnostic on a system that is not supported.

OSX

Apple Service Diagnostic

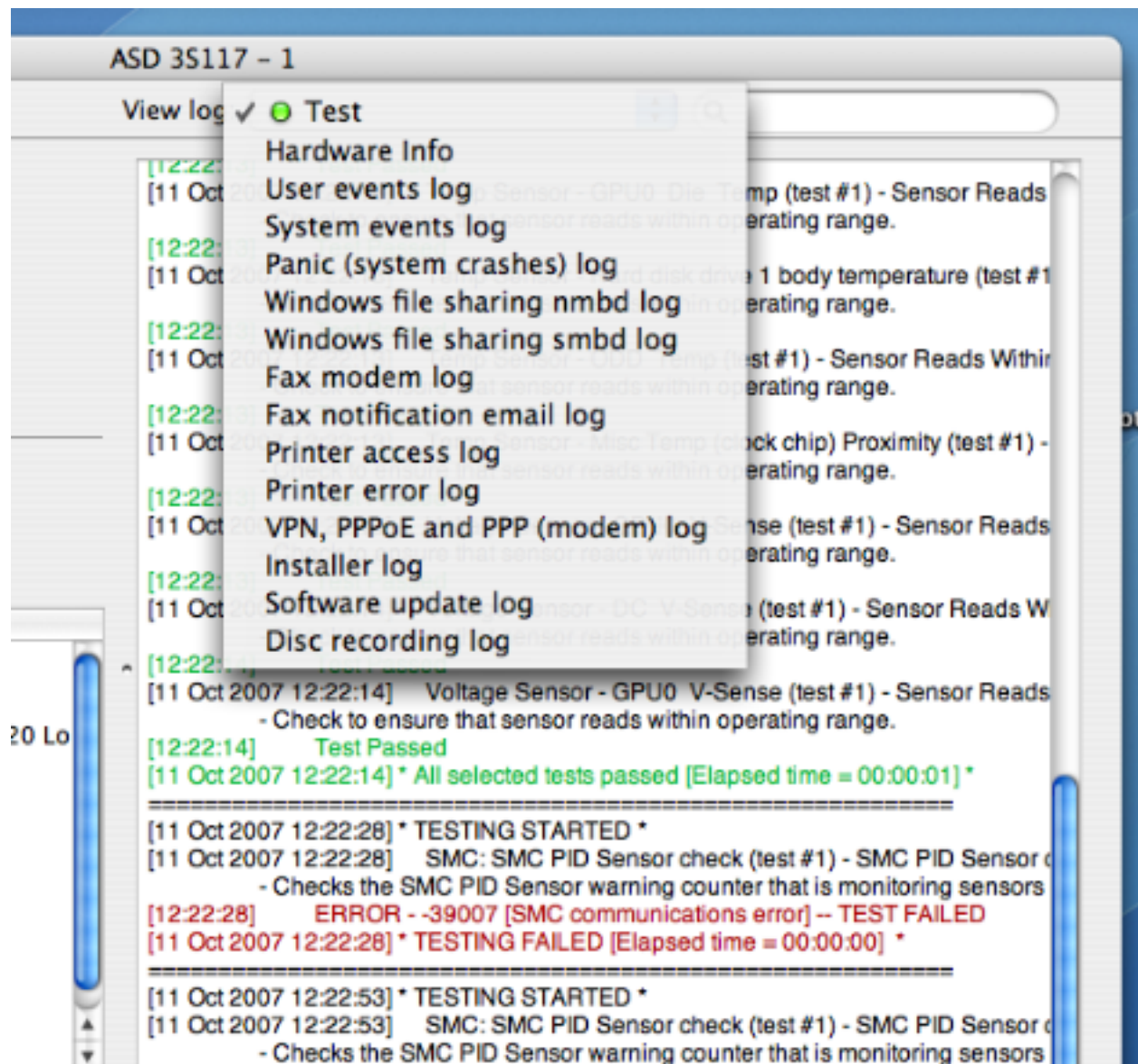Apple Service Diagnostic does not support this machine (Mac-F42786C8/iMac4,1).

Quit

Apple Service Diagnostic OS Test Window

The primary sections are test controls, test selection, test log window, and general test logs.

View Log

View Log drop down menu allows viewing of various application and system logs. To view the Macintosh hardware configuration use the Hardware Info log. By default, the other logs pertain to the booted operating system. To view other logs from the hard drive of the Macintosh under test, select View Different System's Logs from the Log menu, and select the appropriate system. When you view a log, and it currently has no information in it, ASD tries to load that information. If ASD can load information, it marks that popup with a green circle; if no information was available, it marks it with a yellow circle.

Test Controls


```
○ ○ ○                                                    AS

  System Info: 10.4.10(8T3004)  IP Address:17.205.14.100    V

    Start Testing

  Status: * TESTING FAILED [Elapsed time = 00:00:00]  *


  Start Time:    11 Oct 2007 12:22:53
  End Time:      11 Oct 2007 12:22:53
  Elapsed Time: 00:00:00


  On Error:  Stop

  ☐ Loop tests by:  ⦿ Count:  2

                    ⦿ Time:   1    hrs    0    min
```

To start testing press the Start Testing button. The Start Testing button will dim and test status, start time, end time, and elapsed time will be displayed along with a test progress bar. On Error has two states: Stop On Error or Continue On Error. Select the state with On Error pop down menu. You can also set the number of times (Loops) you want the tests to run or you can set the amount of time, 23hrs 59min maximum, you want the selected tests to run in hours and minutes. If a failure occures during testing testing will stop if On Error is set to Stop. If On Error is set to Continue testing will proceed until the set number Loops or Time has expired even if a failure occurs.
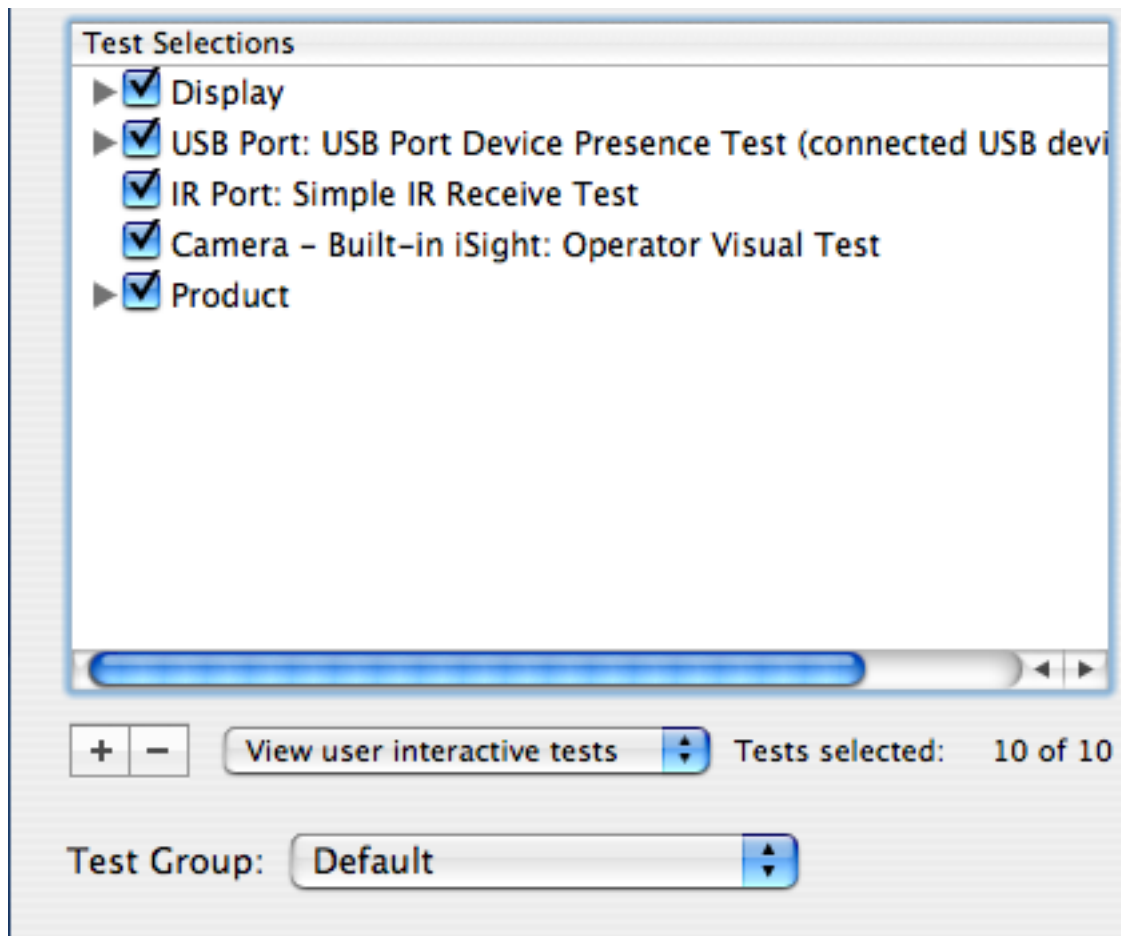
Selecting Tests

Stand Alone Tests

There are two types of tests, Stand Alone and User Interactive. Stand Alone tests do not require any user interaction during testing. Test selections panel allows tests to be selected or deselected individually. Each test group listed has an associated disclosure triangle next to it. Clicking the disclosure triangle expands the listing to show the individual tests for a group. Clicking on the group check box will enable or disable tests for a group. If group tests are not all selected a - , heyphen, appears in the group check box. If all tests are deselected the group check box will be deselected also. To deselect a test click on its check box. The +, plus, button

selects all tests and groups. The − , minus, button deselects all tests and groups. Changes to the test selections are not saved when the machine is shut down or restarted. You can save a set of custom test selections by selecting Test Group drop down then pick "Save Current Group.." and give it a name. The next time the machine is booted this test configuration can be selected from Test Groups.
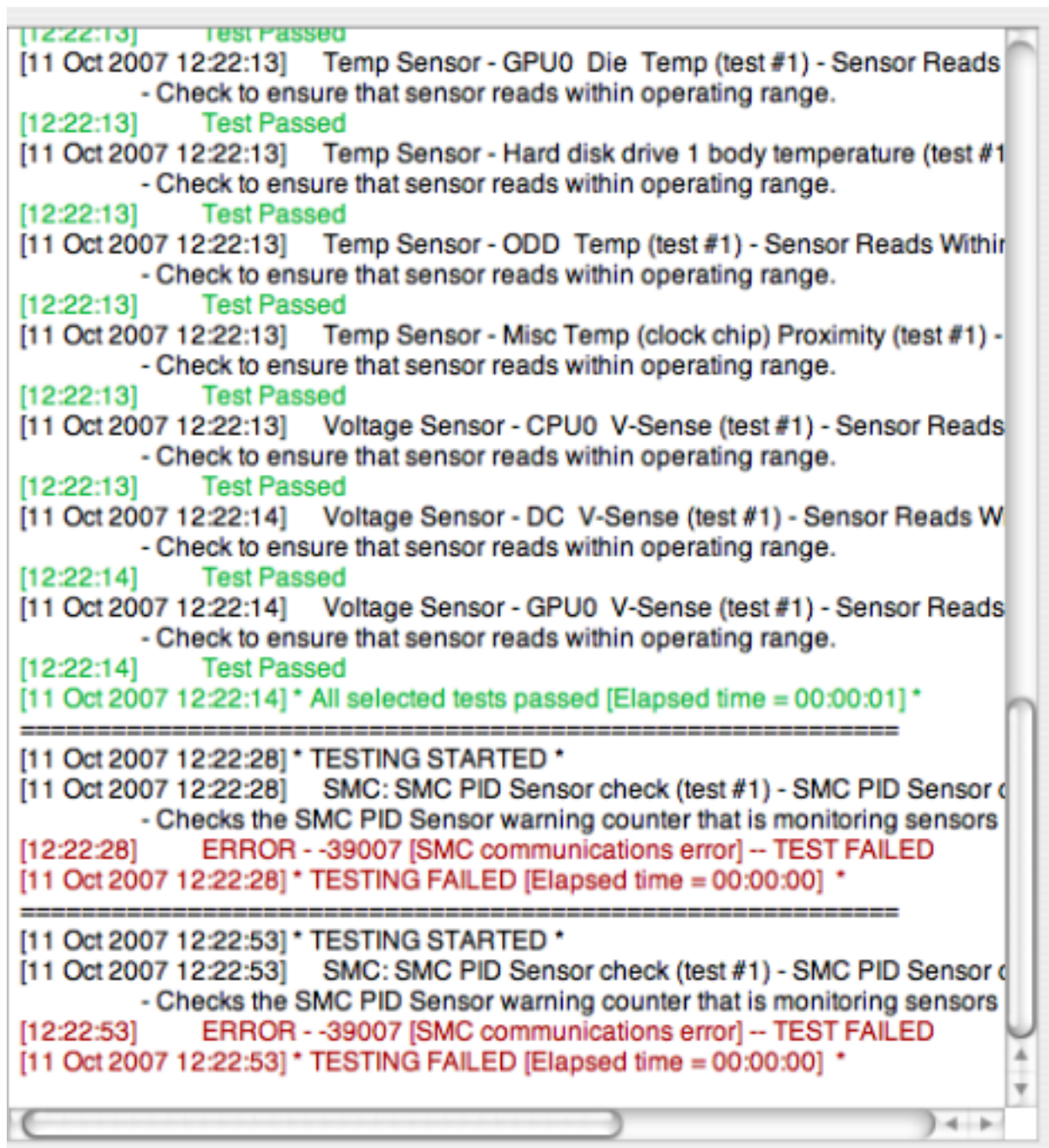
User Interactive Tests

User interaction tests requires user to be part of the test process. A dialog will come up informing the user as to what that requirement is and what action is to be taken.
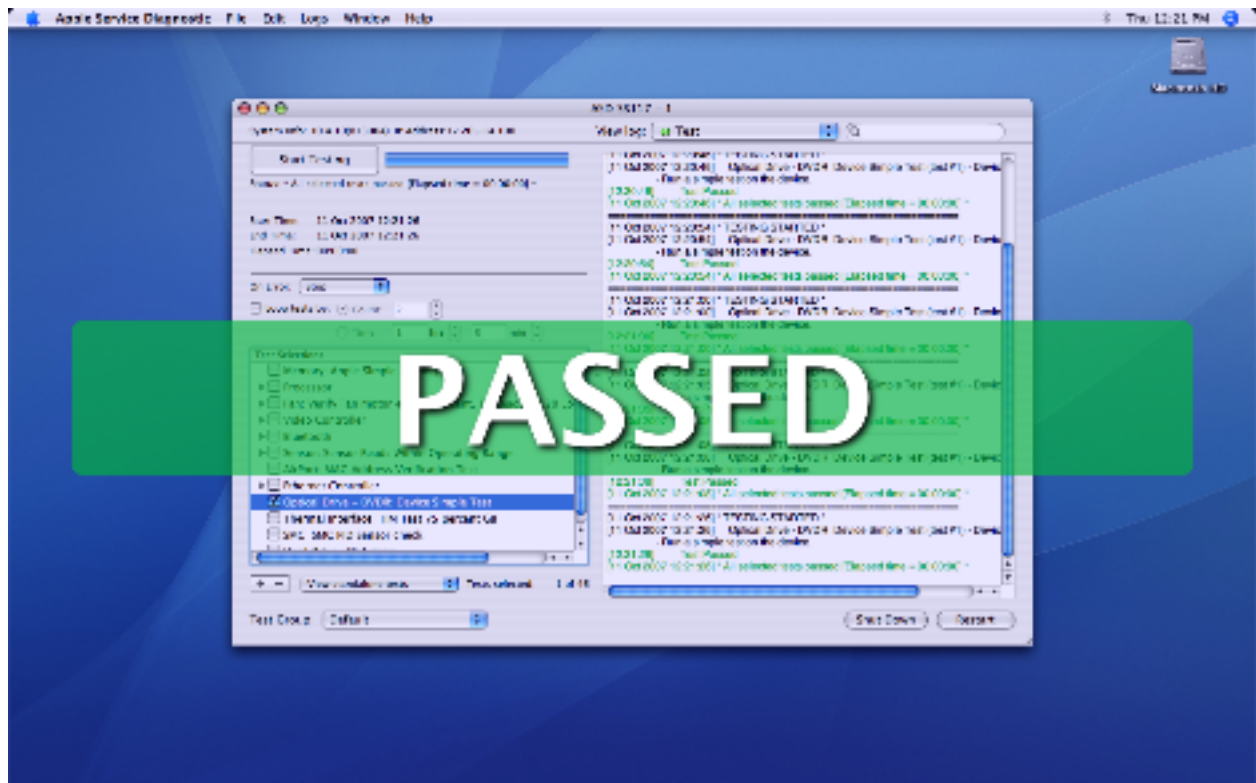
Test Log

```
[12:22:13]      Test Passed
[11 Oct 2007 12:22:13]    Temp Sensor - GPU0 Die Temp (test #1) - Sensor Reads
          - Check to ensure that sensor reads within operating range.
[12:22:13]      Test Passed
[11 Oct 2007 12:22:13]    Temp Sensor - Hard disk drive 1 body temperature (test #1
          - Check to ensure that sensor reads within operating range.
[12:22:13]      Test Passed
[11 Oct 2007 12:22:13]    Temp Sensor - ODD Temp (test #1) - Sensor Reads Withir
          - Check to ensure that sensor reads within operating range.
[12:22:13]      Test Passed
[11 Oct 2007 12:22:13]    Temp Sensor - Misc Temp (clock chip) Proximity (test #1) -
          - Check to ensure that sensor reads within operating range.
[12:22:13]      Test Passed
[11 Oct 2007 12:22:13]    Voltage Sensor - CPU0 V-Sense (test #1) - Sensor Reads
          - Check to ensure that sensor reads within operating range.
[12:22:13]      Test Passed
[11 Oct 2007 12:22:14]    Voltage Sensor - DC V-Sense (test #1) - Sensor Reads W
          - Check to ensure that sensor reads within operating range.
[12:22:14]      Test Passed
[11 Oct 2007 12:22:14]    Voltage Sensor - GPU0 V-Sense (test #1) - Sensor Reads
          - Check to ensure that sensor reads within operating range.
[12:22:14]      Test Passed
[11 Oct 2007 12:22:14] * All selected tests passed [Elapsed time = 00:00:01] *
============================================================
[11 Oct 2007 12:22:28] * TESTING STARTED *
[11 Oct 2007 12:22:28]    SMC: SMC PID Sensor check (test #1) - SMC PID Sensor c
          - Checks the SMC PID Sensor warning counter that is monitoring sensors
[12:22:28]      ERROR - -39007 [SMC communications error] -- TEST FAILED
[11 Oct 2007 12:22:28] * TESTING FAILED [Elapsed time = 00:00:00] *
============================================================
[11 Oct 2007 12:22:53] * TESTING STARTED *
[11 Oct 2007 12:22:53]    SMC: SMC PID Sensor check (test #1) - SMC PID Sensor c
          - Checks the SMC PID Sensor warning counter that is monitoring sensors
[12:22:53]      ERROR - -39007 [SMC communications error] -- TEST FAILED
[11 Oct 2007 12:22:53] * TESTING FAILED [Elapsed time = 00:00:00] *
```

During testing the test log window will display current test information. Date, time, test name, test description, and test results when the test is finished. Green text indicates that the test passed and red text for a failure.
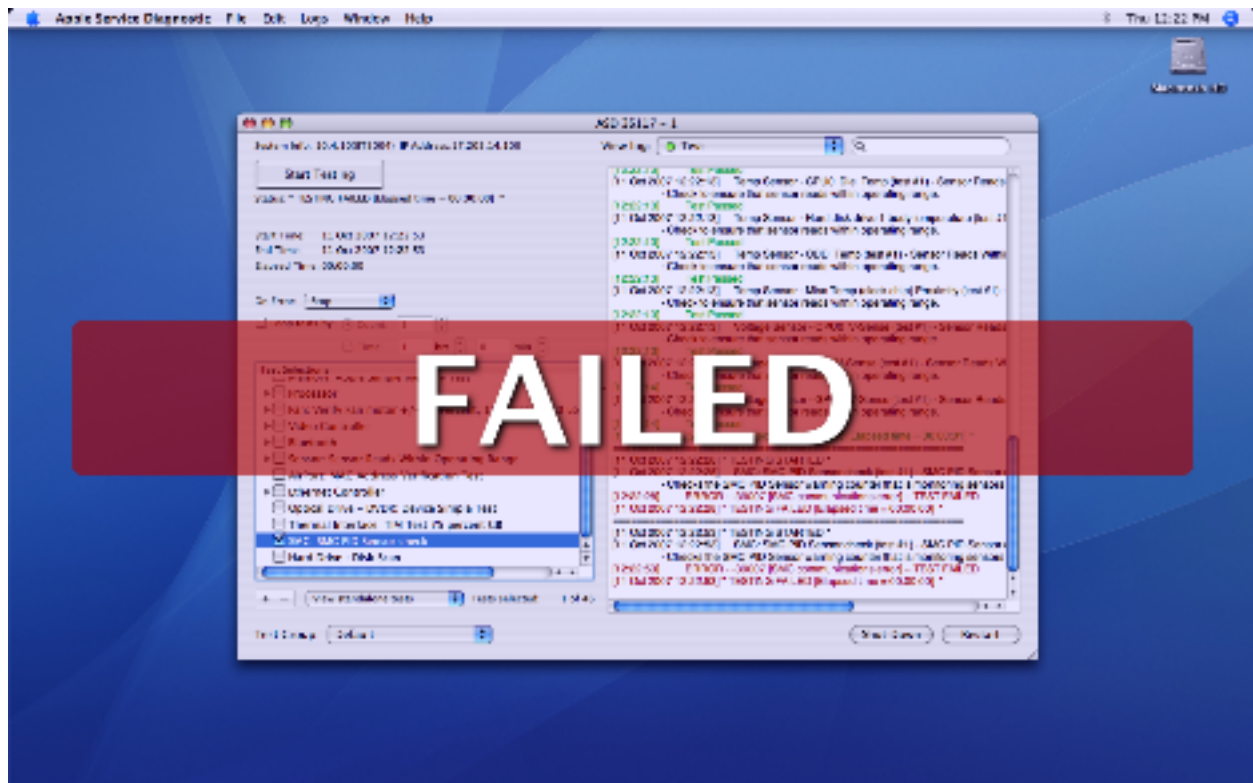
16

Testing Passed

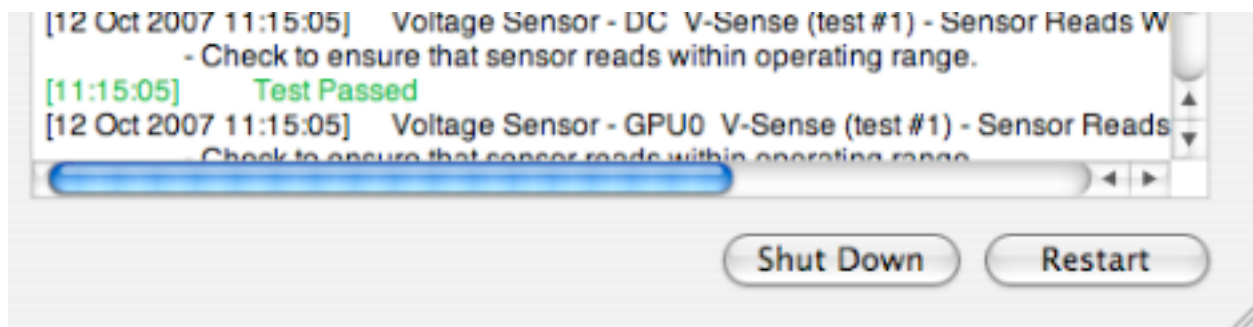

When testing has finished and there were no failures the the green PASSED banner appears. Click anywhere on the screen to dismiss it.

Testing Failed

When testing has finished and there were failures the the red FAILED banner appears. Click anywhere on the screen to dismiss it.
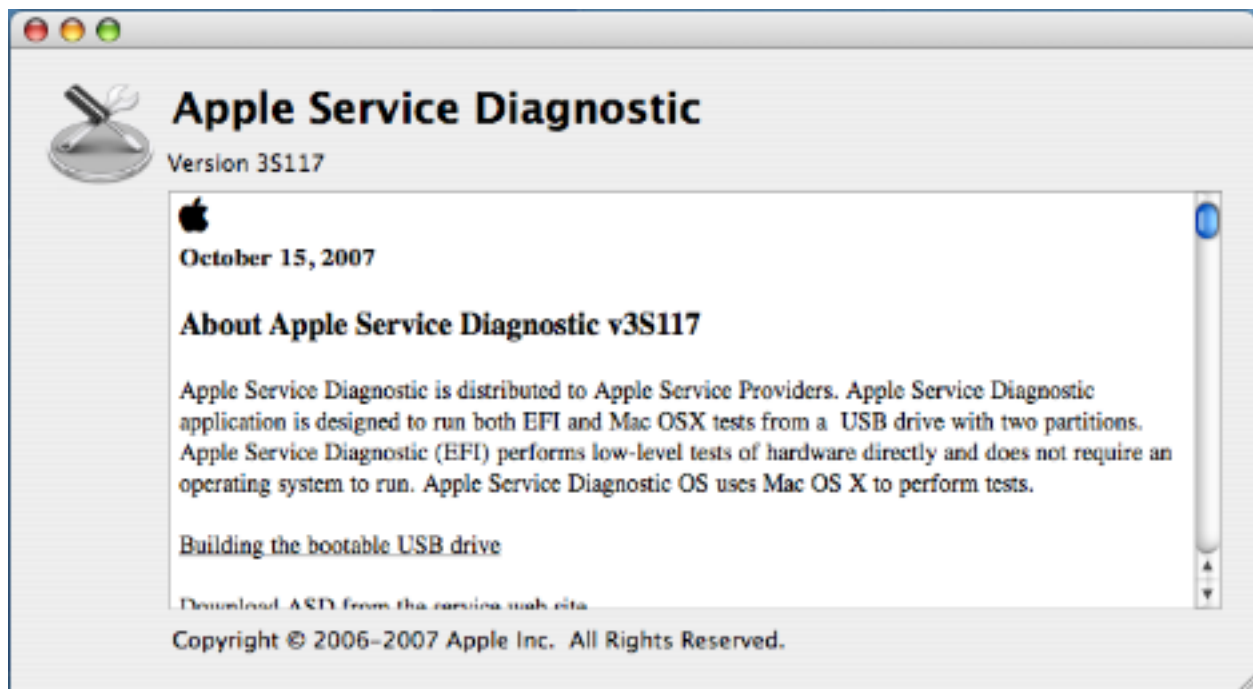
Quitting the application

When unit testing is done press Stut Down or Restart.
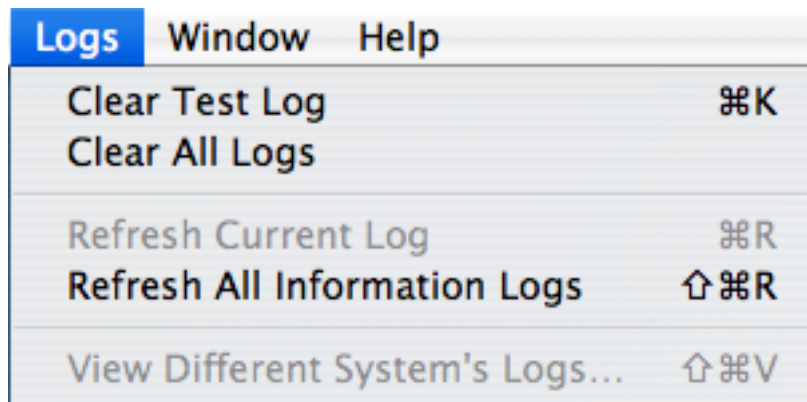
Menu Items

About Apple Service Diagnostic

Selecting About Apple Service Diagnostic from the Apple Service Diagnostic menu brings up the about box. This is the same information that's desplayed by the Help menu.

Select File menu for general File functions and custom Log functions.

Select Edit menu for general edit functions and to Select all tests or Deselect all tests.

Select Logs menu to control Log states.

Selecting Apple Service Diagnostic from the Help menu brings up ASD User Guide document.