

SunVTS™ 2.0.1 Test Supplement

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Preface

The *Sun Validation and Test Suite (SunVTS) 2.0.1 Test Supplement* adds new and enhanced test information to the *SunVTS 2.0 Test Reference Manual*. This manual contains descriptions of the new SunVTS tests that run on machines with SPARC™ architectures. Information about the new SunVTS tests includes descriptions of specific test options, test modes, command line syntax, and error messages.

This manual is primarily written for hardware testing and verification purposes. It can also be used by developers or experienced users who want to run SunVTS diagnostic applications in a test environment.

How This Book Is Organized

This manual is organized as follows:

Chapter 1, Introduction, describes how to access SunVTS, the hardware and software requirements for running SunVTS, how to test frame buffers, and how to do remote testing.

Chapters 2 through 5, describe the new SunVTS tests, options, command line syntax, other applicable test modes, and error messages.

UNIX Commands

This document may not include specific software commands or procedures. Instead, it may name software tasks and refer you to operating system documentation or the handbook that was shipped with your new hardware.

The type of information that you might need to use references for includes:

- Shutting down the system
- Booting the system
- Configuring devices
- Other basic software procedures

See one or more of the following for more details:

- *Solaris Handbook for SMCC Peripherals*, Which contains Solaris™ software commands
- On-line AnswerBook™ for the complete set of documentation supporting the Solaris 2.x software environment
- Other software documentation that you received with your system

Shell Prompts

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

Table P-1 Shell Prompts

Shell	Prompt
C shell	machine_name%
C shell superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Typographic Conventions

The following table describes the typographic changes used in this book.

Table P-2 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> You have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	<code>machine_name%</code> su Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be root to do this.

Related Documentation

The following table lists other SunVTS documents and related manuals:

Table P-3 SunVTS Documents

Document Title	Part Number
<i>SunVTS 2.0 Test Reference Manual</i>	802-5330
<i>SunVTS 2.0 Quick Reference Card</i>	802-5329
<i>SunVTS 2.0 User's Guide</i>	802-5331

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Luxembourg	32-2-720-09-09	32-2-725-88-5
Germany	01-30-81-61-91	01-30-81-61-92
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Introduction



The Sun Validation and Test Suite (SunVTS) software runs multiple diagnostic hardware tests from a single user interface. SunVTS verifies the configuration, functionality, and reliability of most hardware controllers and devices.

SunVTS works from either the Common Desktop Environment™ (CDE) user interface or the OPEN LOOK™ (OL) user interface, which lets you set test parameters quickly and easily while running the diagnostic tests. The sample screens and menus in this manual are from the SunVTS application using the OPEN LOOK user interface.

This manual describes SunVTS Version 2.0.1, which is on the *SMCC Updates CD*. The default installation directory for SunVTS is `/opt/SUNWvts`. When you install SunVTS, you can specify a different directory in which to install the software.

Accessing SunVTS

You can access SunVTS from various interfaces: CDE, OL, or the TTY interface. SunVTS tests can also be run from a shell command line, using the command line syntax for each test. The SunVTS kernel probes for hardware devices installed on your system or on a remote system. Table 1-1 describes the various SunVTS system interfaces.

Table 1-1 SunVTS System Interfaces

SunVTS System Interfaces	Description
Graphical User Interfaces (GUIs)	Users select tests and test options by pointing and clicking with a mouse button. You can use the CDE or OL interface.
TTY Interface	Users run SunVTS from a terminal or modem attached to a serial port. This feature requires that you use the keyboard instead of using the mouse, and it displays one screen of information at a time. However, it emulates the window system whenever possible.
Command Line Interface	Users run each of the SunVTS tests individually from a shell command line using the command line syntax. Each test description contains the corresponding command line syntax. For more information about running individual tests from the command line, refer to the specific test description in this manual and “Standard Command Line Arguments” on page 3.

Standard Command Line Arguments

Different types of command line arguments can be applied to a test: generic command arguments (common to all tests), and test-specific command arguments. Because the code for each test defines test-specific arguments, this section only addresses generic command parameters.

The standard usage for all SunVTS tests is:

Usage: *testname* [-scruvdtelnf] [-p *number*][-i *number*] [-w *number*] [-o *test specific arguments*]

The following table defines the standard SunVTS command line arguments:

Table 1-2 Standard SunVTS Command Line Arguments

Argument	Definition
-s	Runs a test in SunVTS mode
-c	Enables a core dump; the test creates a core file if a system crash occurs
-r	Runs on error; if an error occurs, the test continues the next test sequence instead of exiting
-u	Displays the Usage statement
-v	Runs the test in Verbose mode; the test displays VERBOSE messages that tell more about the testing process
-d	Runs the test in Debug mode; the test displays DEBUG messages to help programmers debug their test code
-t	Runs the test in test function trace mode; the test displays TRACE messages that track down function calls and sequences currently being used by the test code
-e	Runs in stress mode; the test runs under increased system load
-l	Runs in Online mode
-n	Runs in Connectivity mode
-f	Runs in Offline mode
-i <i>number</i>	Defines the number of instances for scalable tests
-p <i>number</i>	Defines the number of passes
-w <i>number</i>	For scalable tests, defines which instance the test is assigned

Test-Specific Arguments

Test-specific arguments should follow the format specified in the `getsubopt(3c)` man page. At least one test-specific argument is required, as described in Table 1-3.

Table 1-3 SunVTS Test-Specific Arguments

Argument	Definition
-o	Separate each test-specific argument by commas, with no space after the each comma. For example: <pre># ./sample -v -o dev=/dev/audio,volume=78</pre> The test option format is specified by the man page <code>getsubopt(3C)</code> .

Test Modes

SunVTS has several test modes that you can select during testing: Connectivity, Online, Offline, and Stress. For more information about these various test modes, refer to the specific test description in this manual.

Hardware Verification

The SunVTS kernel automatically probes the system kernel for installed hardware devices. Those devices are then displayed on the SunVTS control panel with the appropriate tests and test options. This provides a quick check of your hardware setup.

Hardware and Software Requirements

The SunVTS Version 2.0.1 software runs on any system with the Solaris 2.5 or Solaris 2.5.1 operating environment installed. The operating system kernel must be configured to support all peripherals that are to be tested.

Software Requirements

The default Graphical User Interface (GUI) is OPEN LOOK. You must meet the following requirements to run SunVTS with the OPEN LOOK GUI:

- Run Solaris 2.5 operating system
- Run OPEN LOOK, Version 3.3
- Set the correct `openwin` path
Set the `OPENWINHOME` environment variable to point to the location where OPEN LOOK is installed on your system. You can ignore this requirement if you use the default location, `/usr/openwin`.

Otherwise, use the following command and substitute the *pathname* variable for the actual path where OPEN LOOK is installed.

```
% setenv OPENWINHOME pathname
```

Check the existing `OPENWINHOME` by typing `env`

- Set the correct library path.
Set the `LD_LIBRARY_PATH` environment variable to point to the location of the Windows library directory on your system. If you use the default location, `/usr/openwin/lib`, you can ignore this requirement.

Otherwise, use the following command and substitute the *pathname* variable for the actual path where OPEN LOOK library is installed.

```
% setenv LD_LIBRARY_PATH pathname
```

- ◆ Check the existing `LD_LIBRARY_PATH` by typing `env`

You must meet the following requirements to run SunVTS with the CDE GUI:

The CDE GUI requires that the CDE End User Software be installed, or at least the `SUNWdtbas` package from it. See your system administrator for assistance in installing the CDE software. The CDE GUI will run on either the OPEN LOOK desktop or the CDE desktop.

Testing Multiple Frame Buffers

These rules apply when you test multiple frame buffers (displays) simultaneously:

- You can test multiple frame buffers on a system at the same time, but only one frame buffer can run the OPEN LOOK software.
- To avoid incorrect test failures, the frame buffer that runs the OPEN LOOK software must have window locking enabled. Any other frame buffers must have window locking disabled.



Caution – If window locking is disabled (unlocked) on frame buffers that are running OPEN LOOK software, the SunVTS tests can return spurious error messages if you move the mouse during testing. A slight mouse movement can cause a test to fail.

- By default, SunVTS enables window locking on the console monitor (frame buffers that are pointed by `/dev/fb`) and disables the screensaver utility.
- If you are running a frame buffer test from a command line, you can disable window locking by specifying a command line argument (see the test command line descriptions in this manual). For example, when running the generic frame buffer test (`fbtest`), use the `lock=e/d` option to disable or enable frame buffer locking. Frame buffer locking is enabled in the example below.:

```
#./fbtest -o dev=cgthree0,lock=e
```

Remote Testing

The frame buffer locking option does not work when you start `sunvts` or `vtsk` remotely. In this case, set the frame buffer locking option to disable. Do not run any graphic programs (including `vtsui`) on that frame buffer during graphic testing.

Disk and Floppy Drives Test (disktest)



`disktest` verifies the functionality of hard disk drives and floppy drives using three subtests (see Table 2-1). The `disktest` test performs a random seek check followed by a read test or a read after a write test on the disk. Most disk drives, such as SCSI disks, native or SCSI floppy disks, IPI, IDE, and so on, are supported. The type of drive being tested is displayed on the top of the option menu.

Initially, `disktest` probes the disks under `/dev/rdisk`. It checks all of the partitions of each disk. If any partition has a file system that is not yet mounted, `disktest` pre-mounts these partitions for the File System subtest. The pre-mount point bears the name of the disk partition appended with a system-wide unique number. For example, if the disk name is `/dev/dsk/c0t3d0`, `disktest` mounts it as superuser under the name `/c0t3d0.xxxxxx`. Where `xxxxxx` is a six-digit system-wide number. To disable the pre-mount point feature, set the `BYPASS_FS_PROBE` environmental variable to one:

```
# setenv BYPASS_FS_PROBE 1
```

The option menu shows all partitions (except the `swap` partition, partition 1) that are available for testing. The File System subtest can only be run if the selected partition *is* mounted. The Write option of the Media subtest is allowed only if a selected partition is *not* mounted.

`disktest` tests the floppy drive regardless of whether the Volume Management software is running.

- If the Volume Management software is running, `disktest` tests the disk drive with the mount point name in the `/etc/mnttab` file.



Caution – If a power failure occurs while the Media subtest is being run in write mode, disk data will be destroyed.

- If the Volume Management software is *not* running, `disktest` tests the disk drive with the device name `dev=/dev/diskette`. Do not edit the `/etc/vold.conf` file to change the floppy drives. Currently, the SunVTS software is hard-coded to use these path names as the default logic name.

Table 2-1 describes the `disktest` subtests.

Table 2-1 `disktest` Subtests

Subtest	Description
Media Subtest	Verifies disk media by writing data to and reading data from the disk. The Media subtest treats a disk as one large chunk of contiguous data. This is a scalable test, that can run multiple copies of it in read/write mode on the same disk partition. To avoid data corruption, all simultaneous instances of <code>disktest</code> communicate through a shared memory service. This ensures that different copies of the media subtest do not overlay the same disk block at the same time.
File System Subtest	Verifies the disk system's integrity. The file system subtest exercises the partition being tested to determine if it is mounted. If the partition is not already mounted or pre-mounted, then the test is blocked. The test opens two temporary files (of the size specified on <code>File System File Size</code>) and performs a Read/Write test.

Table 2-1 disktest Subtests

Subtest	Description
Asynchronous I/O Subtest	Uses the asynchronous read/write feature of the Solaris disk driver to exercise the disk. In read-only mode, the test sends a maximum of four asynchronous read packets, each with a random size and a random offset into the selected partition. The test then waits for all outstanding I/O activity to complete before issuing another round of packets. This process continues until the whole area being tested is covered. In read-write mode, one write packet is issued in every four read packets as a spot check of the write operation. Before data is written to a particular location, data is backed up, write-verified, and restored to its original state.

disktest *Test Options*

The screenshot shows a window titled "Disk-c0t3d0" with a configuration and options menu. The "Configuration" section lists hardware details: Capacity: 510.23MB, Controller: esp0, Vendor: CONNER, SUN Id: CP30540 SUN0535, Firmware Rev: B0BB, and Serial Number: 93087LS7. The "Options" section includes settings for Partition (0/), Test Media (Enable/Disable), Media Write Read Mode (Readonly), Media Coverage (%) (1), Media Transfer Size (2KB), Test File System (Enable/Disable), File System File Size (512KB), File System Transfer Size (512B), and File System Test Pattern (sequential). At the bottom are "Reset" and "Apply" buttons.

Figure 2-1 disktest Configuration and Options Menu

The `disktest` (see Figure 2-1 and Table 2-2) test has different option menus for different test modes.

Table 2-2 `disktest` Configurations and Options

<code>disktest</code> Options	Description
Partition	Displays the partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as <code>1(/usr)</code> , where 1 is the partition number, and <code>/usr</code> is the mount point.
Test Media	Enables or Disables the Media subtest
Media Write Read Mode	Enables Read Only or Read after write with backup
Media Coverage (%)	Enables users to test all or part of a partition (in percentages)
Media Transfer Size	Displays the transfer size of the media
File System Transfer Size	Displays the transfer size of the File System subtest
File System Test Pattern	Test pattern of File System subtest
Connectivity Mode for hard disk	Option Menu for hard disk partition: 0 - 7 [default] Test Media: [Enable~](fixed to Enable) Test Mode: [Read Only~](fixed to Read Only) Media Coverage(%): [1](default - can be changed) Media Transfer Size: [2KB] Test File System: [Disable~](fixed to Disable)
Online Mode for Hard Disk	Online Mode for hard disk partition: 0 - 7 [default] Test Media: [Enable]<- [Disable] Test Mode: [ReadOnly~](fixed to ReadOnly) Media Coverage(%): [10] Media Transfer Size: [2KB] [10KB] [20KB] <- [40KB] [60KB] Test File System: [Disable~](fixed to Disable)
Offline Mode for Hard Disk	(under SCSI-devices group): partition: 0 - 7 [default] Test Media: [Enable]<- [Disable] Mode: [ReadOnly]<- [BackupWriteRead] Media Coverage(%): [30] Media Transfer Size: [2KB] [10KB] [20KB] <- [40KB] [60KB] Test File System: [Enable] [Disable] <- File System File Size:[512KB]<-[2MB][8MB][20MB] [100MB] [200MB] File System Transfer Size:[512B]<- [1024B][10KB][40KB] [100KB] File System Test Pattern:[sequential] [0x00000000] [0xffffffff] [0x5aa55aa5] [0xdb6db6db] [random]

Table 2-2 disktest Configurations and Options (Continued)

disktest Options	Description
Offline Mode for floppy disk	(under Other-Devices group): partition: 0 - 7 [default] Test Media: [Enable]<- [Disable] Mode: [ReadOnly]<- [BackupWriteRead] Media Coverage(%): [30] Media Transfer Size: [2KB]<- [10KB] [20KB] Test File System: [Enable] [Disable] <- File System File Size:[512KB]<- [2MB] [8MB] [20MB] [100MB] [200MB] File System Transfer Size:[512B]<- [1024B] [10KB] File System Test Pattern:[sequential] [0x00000000] [0xffffffff] [0x5aa55aa5] [0xdb6db6db] [random] NOTE: The floppy disktest can only be run in Offline mode.

disktest *Test Modes*

disktest supports all three test modes. It performs different test schemes on the network device according to the mode you select.

Table 2-3 disktest Test Modes

Test Mode	Description
Connectivity Mode	This mode is only available for the hard disk test. There is no Connectivity mode for the floppy driver test. Only one instance of disktest is allowed for each disk device, which monitors UNIX error messages. disktest displays messages and reports errors. The test also opens the hard disk, checks the disk configuration, reads a few blocks, and then closes the hard disk. No File System subtest is run. No Write option is available in Connectivity mode.

Table 2-3 disktest Test Modes (Continued)

Test Mode	Description
Online Mode	<p>This mode is only available for the hard disk test. There is no Online mode for the floppy driver test. Only one instance of <code>disktest</code> is allowed for each disk device, which monitors UNIX error messages. <code>disktest</code> displays messages and reports errors.</p> <p>In this mode, <code>disktest</code> also opens the hard disk, checks the disk configuration, and executes the Media subtest. Next, <code>disktest</code> performs random seek checks. Only Read Only mode is allowed. The default coverage is 10%. No File System subtest is run. When the test finishes, <code>disktest</code> closes the disk device being tested. No Write option is available in Online mode.</p>
Offline Mode	<p>This mode does not allow <code>disktest</code> to monitor UNIX error messages. More than one instance of <code>disktest</code> is allowed for one disk device. Both File system subtest and Media subtest can be run in Offline mode. Floppy test can also be run in Offline mode.</p>

disktest *Command Line Syntax*

```
/opt/SUNWvts/bin/disktest standard_arguments -o p=n, -i=n,
-w=n, dev=<device_name>, partition=<0-7>, rawsub=E/D, rawrw=,
rawcover=, rawiosize=, method=, fssub=, fssize=, fsiosize=, fspattern=
```

Table 2-4 disktest Command Line Syntax

Argument	Explanation
p=number	Sets the number of passes for the test to run; default is 1
i=number	Sets the number of total instances for the test; default is 1
w=number	Determines which instance this test is assigned; default is 0
dev=<device_name>	Specifies the name of the disk to be tested, such as c0t3d0
partition=<0-7>	Specifies the partition number to test as partition=6(/export/s6) if mounted on partition 6
rawsub=Enable/Disable	Enables or disables the media subtest

Table 2-4 disktest Command Line Syntax (Continued)

Argument	Explanation (Continued)
rawrw= Readonly BackupWriteRead	Specifies the Media subtest Read and Write mode: -Read Only -Write, read then backup
rawcover=	Specifies media coverage from 0-100% of the partition, such as 70526f
rawiosize=<2KB,10KB 20KB,40KB,60KB>	Specifies the media size to transfer
method=SyncIO/AsyncIO	Specifies the media access method. Only available on the command line. Large file systems are not supported.
fssub=Enable/Disable	Enables or disables the file system subtest
fspattern=<data pattern>	Specifies the file system data pattern as sequential or random. {seq(uequential)/0x0(0000000)/0xf(ffffff)/0xa(5a5a5a5)/0x5(a5a5a5a)/ran(dom)/0xd(b6db6db)}
fssize=<file system size>	Indicates the file system subtest size in kilobytes or megabytes: K/k/KB/kb:kilobytes, M/m/MB/mb: megabytes
fsiosize=<file system I/O transfer size>	Indicates the size of the file system subtest I/O transfer in bytes or kilobytes: {512B/1024B/10KB/40KB/100KB}

disktest *Error Messages*

Table 2-5 disktest Error Messages

Error Message	Probable Cause(s)	Recommended Action
6000 Re-reading and re-comparing block <number> on <name>	Media error Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
6002 Error on re-comparing block <number> on <name>	Media error Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
6004 <name> failed on <name> <name>, blk <number>: <error_message>	Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.

Table 2-5 disktest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
6006 Compare error on <name> <name>, block <number>, offset <number>	Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
6008 Compare error: Block <number> on <name> was written with a repeating hex pattern of <number>	Media error Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
6010 TIME OUT!	System too busy Faulty cable, disk, or controller	Reduce the system load. If the problem persists, call your authorized Sun service provider.
6012 Couldn't close <name>	System error	
6014 <name> read failed on disk, in-between blocks <number> and <number>: <name>	Media error Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
6016 <name> read failed due to unexpected end of media:\		
6018 <name> write failed on disk, in-between blocks <number> and <number>: <name>	Media error Faulty disk or controller	If the problem persists, call your authorized Sun service provider.
6020 <name> write failed due to unexpected end of media:		
6022 <name> compare failed on <name>, block <number>, offset <number>	Media error Faulty disk or controller	If the problem persists, call your authorized Sun service provider.
6024 Couldn't close <name>	Faulty disk or controller System error	If the problem persists, call your authorized Sun service provider.
6026 failed automount <name> onto <name>:<error_message>	Un-supported file system System error	Disable the file system substest. Disable the file system substest. If the problem persists, call your authorized Sun service provider.
6028 <error_message>		

Table 2-5 disktest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8000 File system subtest only allow to run on off-line mode	Parameter error	Re-enter the command line correctly.
8002 malloc() failed	System load too heavy System error	
8006 File operation error: Couldn't <name> file <name> on <name>: <error_message>	Lack of system resource Permission error System error	Reduce the system load. Check directory or file permission. If the problem persists, call your authorized Sun service provider.
8008 Not enough free blocks on <name> (partition <number>)		Try another partition or delete files.
8010 No writable partition on <name>		Try another partition.
8012 No file system on device: <name>		Use <code>newfs</code> to create the file system. Disable the file system subtest.
8014 Couldn't run <code>fstest</code> on any partition of device: <name>(except 2)	File system not supported System error	Disable the file system subtest. If the problem persists, call your authorized Sun service provider.
8016 Cannot open device: <name>	Parameter error System error	Enter the correct name of disk as <code>dev=c0t3d0</code> . If the problem persists, call your authorized Sun service provider.
8018 Couldn't mount /dev/dsk/<name>	Parameter error System error	Enter the correct name of disk as <code>dev=c0t3d0</code> . If the problem persists, call your authorized Sun service provider.
8020 Couldn't remove temporary dir <name>: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8022 fail get semaphore: <error_message>	Lack of system resource System error	Reduce the system load. If the problem persists, call your authorized Sun service provider.

Table 2-5 disktest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8024 fail lock mtab semaphore: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8026 fail unlock mtab semaphore: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8028 failed get_volmgr_name()		
8030 Couldn't open <name>: <error_message>	Cable loose or disconnected	Check the cable.
	Device off line or missing	Check the device on line.
	Device not configured	Configure the device.
8032 Get file state <name> failed: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8034 Couldn't open <name>	Permission error	Check the permissions.
	System error	If the problem persists, call your authorized Sun service provider.
8036 failed putmntent(): <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8038 fail rename file	Permission error	Check permission.
	System error	If the problem persists, call your authorized Sun service provider.
8040 Couldn't get mount table entry for <name>		
8042 Invalid device name in <name>	Parameter error	Enter the correct name of disk as dev=c0t3d0.
8044 Message table overflow on device <name>	Parameter error	Enter the correct name of disk as dev=c0t3d0.
	System error	If the problem persists, call your authorized Sun service provider.
	Program error	
8046 Invalid controller id <name> for <name>	Parameter error	Re-enter the command line correctly.
8048 <name>, disk DKIOCINFO ioctl: <name>	Controller is not supported	Disable the file system substest.
	System error	If the problem persists, call your authorized Sun service provider.

Table 2-5 disktest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8050 failed getting shared memory for monitor <number>: <error_message>:	Lack of system resource System error	Reduce the system load. If the problem persists, call your authorized Sun service provider.
8052 failed attaching monitor shared memory:<error_message>	Lack of system resource System error	Reduce the system load. If the problem persists, call your authorized Sun service provider.
8053 failed create monitor shared memory <number>:	Lack of system resource System error	Reduce the system load. If the problem persists, call your authorized Sun service provider.
8054 Shm remove error: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8056 New error messages in system log. Extracted below:<error_message>	Faulty cable/disk/controller	See /var/adm/messages for more information. If the problem persists, consult your authorized Sun service provider.
8060 fails to open any partition of <name>	File system not mounted	Mount the file system then run the test. Disable the file system subtest. If the problem persists, call your authorized Sun service provider.
8060 failed getting semaphore: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8062 failed getting shared memory: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8064 failed attaching shared memory:<error_message>	System error	If the problem persists, call your authorized Sun service provider.
8068 failed unlocking semaphore: <error_message>	System error	If the problem persists, call your authorized Sun service provider.
8070 fail open floppy disk	No floppy disk in drive	Check the floppy disk.
8072 failed FDI0GCHAR on floppy ioctl	System error	If the problem persists, call your authorized Sun service provider.

Table 2-5 disktest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8074 ioctl DKIOCGGEO failed	File system not supported System error	If the problem persists, call your authorized Sun service provider.
8074 ioctl DKIOCGAPART failed	System error	If the problem persists, call your authorized Sun service provider.
8076 fail initialize shared memory	System error	If the problem persists, call your authorized Sun service provider.
8078 Illegal parameters on Online Mode	Parameter error	Enter the correct option.
8080 Illegal parameters on Conn. Mode	Parameter error	Enter the correct option.
8082 failed get_volmgr_name()	No floppy disk in drive	Check the floppy disk.
8084 Mounted file system on device!	Not enough disk space	Reduce the system load.
	Permission error	Check directory or file permissions.
	System error	If the problem persists, call your authorized Sun service provider.
8086 Invalid controller id <number> from <name>	Parameter error	Enter the correct name of disk as dev=c0t3d0.
8088 Couldn't get file system information on <name> errno=<number>	System error	If the problem persists, call your authorized Sun service provider.
8090 ioctl() failed on <name>: <name>	System error	If the problem persists, call your authorized Sun service provider.
8092 Fail to get disk information	No supported disk	No UNIX message monitor feature in this disk(2).
	System load too heavy	Reduce the system load
8094 Failed to create a message base for controller <number>	No disk under this controller	Connect the disk driver then run the test again.

Table 2-5 disktest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8096 fail to make directory <name>	Lack of system resource	Reduce the system load.
	Permission error	Check directory or file permissions.
	System error	If the problem persists, call your authorized Sun service provider.
8098 Failed to mount partition	Does this disk only have partition 2	Partition 2 must be manually mounted.
8010 r/w is on /dev/r<name>	System error	If the problem persists, call your authorized Sun service provider.
8102 write/read count error	Out of disk space	Try another partition or delete some files.
8104 failed to create buffer	Not enough memory	Reduce the system load. If the problem persists, call your authorized Sun service provider.
8106 failed aioread() : <offset> <error number> <error string>	Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
8108 failed aiowrite() : <offset> <error number> <error string>	Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.
8110 failed aiooperation() : <number> <text>	Large file is not supported	Deselect the Async test method from the option menu.
	Faulty cable, disk, or controller	If the problem persists, call your authorized Sun service provider.

Environmental Test (envtest)



envtest exercises devices on the I2C bus that are used to control the systems operating environment. The envtest is comprised of five subtests which test and report on the power supply status, system temperature status, fan speed, disk LEDs, and front panel and keyswitch. envtest is not scalable.

envtest *Options*

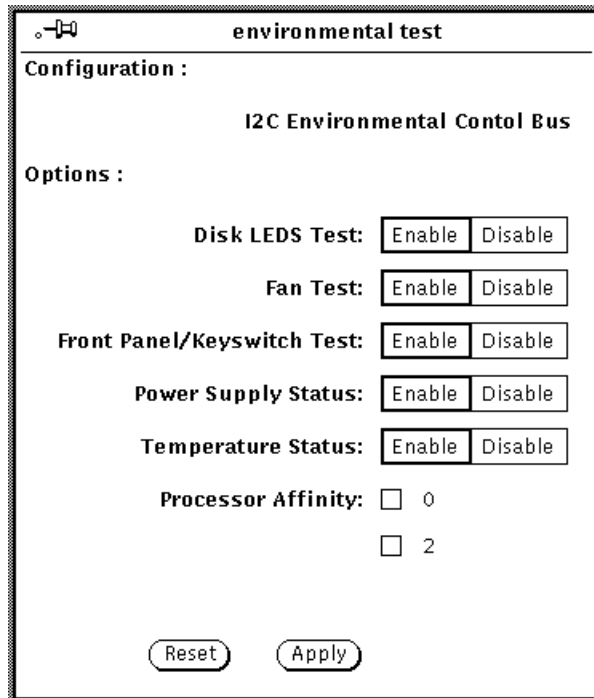


Figure 3-1 envtest Options Menu

Table 3-1 envtest Options

<code>envtest</code> Options	Description
Disk LEDs Test	Illuminates each LED on the disk backplane(s) to green, then amber, and then back to its original state. The test then illuminates <i>ALL</i> disk LEDs to green, then amber, and then back to their original state. This test is only enabled in Offline mode.
Fan Test	Cycles each fanbank speed to low, medium, and high, then verifies the correct speed. Next, each fanbank is stopped, one at a time. The test then verifies that a fan fault has occurred and checks to see if the remaining fanbanks have been set to high. Next, the watchdog timer is invoked to simulate a catastrophic failure. The test verifies that the system set all fanbanks to high and then resets the fan speed to normal. This test is only enabled in Offline mode.
Front Panel and Keyswitch Test	Flashes each individual LED on the front panel to ON (green or amber), then OFF, and then back to its original state. The test then illuminates all front panel LEDs then sets them back to their original state. The power on LED is Read Only and will not be cycled. The test then displays the current keyswitch position. This test is only enabled in Offline mode.
Power Supply Status	Identifies the number of power supplies that are in the system, the state of each power supply, and verifies that the power supply temperatures are within normal operating parameters. This test is enabled in all modes.
Temperature Status	Identifies the current temperature of each CPU in the system, the ambient temperature of the system, and verifies that all temperatures are within normal operating parameters. This test is enabled in all modes.

envtest *Test Modes*

envtest supports all three testing modes: connectivity, online, and offline.

Table 3-2 envtest Test Modes

Test Mode	Description
Connectivity Mode	Reports the status of the power supplies, the temperature sensors within the system, and verifies normal operating parameters
Online Mode	Uses the same functionality as Connectivity mode (above)
Offline Mode	Tests the disk back panel, front panel LEDs, and fan control circuitry. Also uses the same functionality as Online mode and Connectivity mode.

envtest *Command Line Syntax*

```
/opt/SUNWvts/bin/envtest [standard arguments] [-o
dev=device name,diskleds=E/D,fans=E/D,fpanel=E/D,
psupply=E/D,temp=E/D,env_mon=interval
```

Table 3-3 envtest Command Line Syntax

Argument	Explanation
dev=raw_device_name	Specifies the name of the raw device to test
diskleds=enable disable	Enables or Disables diskleds test
fans=enable disable	Enables or Disables fans test
fpanel=enable disable	Enables or Disables front panel test
psupply=enable disable	Enables or Disables power supply test
temp=enable disable	Enables or Disables temperature test
env_mon=Interval	Displays all environmental statistics, does not test.

envtest *Error Messages*

Table 3-4 envtest Error Messages

Error Message	Probable Cause(s)	Recommended Action
8000 Unable to open driver <driver name>: <sys error msg>	Device name is wrong or driver is not loaded	Check the device name (if entered) or load driver.
	Device busy	Kill all other processes accessing driver.
8001 kstat_open failed	No kernel resource available System software error	Consult /var/adm/messages file for more information.
8002 kstat_lookup failed for <envtest structure> in <kstat module>	envtest module not found	Check revision and reload envctrl driver.
	No kernel resource available System software error	Consult /var/adm/messages file for more information.
8003 kstat_read failed <envtest structure> in <kstat module>	envtest module not found	Check revision /reload envctrl driver.
	No kernel resource available System software error	Consult the /var/adm/messages file for more information.
8004 Unable to close kstat	No kernel resource available	Consult the /var/adm/messages file for more information.
	System software error	
8005 Unable to set mode to DIAG using ioctl.: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.
8006 Unable to set disk LEDs: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.
8007 Unable to get disk LEDs: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.
8008 Unable to set <fan type> fan speed to <speed>: <sys error msg>	Fan hardware failure	Manually check the fan speed and replace the fan.
	System software error	Consult the /var/adm/messages file for more information.
8009 Unable to get <fan type> fan speed: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.

Table 3-4 envtest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8010 <fan type> fan speed <speed> out of range	Fan hardware failure	Manually check the fan speed and replace the fan.
	System software error	Consult the /var/adm/messages file for more information.
8011 Forced fan fault did not occur for <fan type> fanbank	Hardware failure	Replace the hardware.
	System software error	Consult the /var/adm/messages file for more information.
8012 Forced fan fault did not clear for <fan type> fanbank	Hardware failure	Replace the hardware.
	System over temperature	Consult the /var/adm/messages file for more information.
	System software error	Consult the /var/adm/messages file for more information.
8013 Unable to set watchdog timer	Hardware failure	Replace the hardware.
	System software error	Consult the /var/adm/messages file for more information.
8014 Unable to set temperature to <temperature>	System software error	Consult the /var/adm/messages file for more information.
8015 Power Supply <supply> has failed: Limit <0=PASS 1=FAIL> Current Share <0=PASS 1=FAIL> Temperature <temperature>	Power supply hardware failure	Replace the power supply.
8016 Unable to allocate memory using malloc.: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.
8017 Unable to set mode to NORMAL using ioctl.: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.
8018 Error encountered during call to <function name>		
8019 Unable to set front panel LEDs using ioctl.: <sys error msg>	System software error	Consult the /var/adm/messages file for more information.
8020 Unable to reset front panel LEDs to original state	System software error	Consult the /var/adm/messages file for more information.

Table 3-4 envtest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8021 Unable to set front panel LEDs to <led mask>	System software error	Consult the <code>/var/adm/messages</code> file for more information.
8022 Ambient temperature <temperature> Celsius out of range	envctrl hardware error	
8023 CPU <CPU #> temperature <temperature> Celsius out of range	envctrl hardware error	
8024 Data Miscompare: ioctl diskled mask = <diskled mask> kstat diskled mask = <diskled mask>	envctrl hardware error System software error	Consult the <code>/var/adm/messages</code> file for more information.
8025 Illegal options passed to envtest <option>	User error	Check usage by typing envtest -u .
8026 Unable to retrieve power supply information.	I2C hardware failure I2C bus wedged	Replace power supply. Check for other I2C devices that may be corrupting the I2C bus.
8027 Power Supply Over Temperature: PS Slot <slot> PS Temperature <temperature>.	Bad Power Supply	Replace Power Supply.

Serial Asynchronous Interface (PCI) *Test (saiptest)*



`saiptest` checks the functionality of the Serial Asynchronous Interface card through its device driver.

`saiptest` *Hardware Requirements*

Before running the SunVTS diagnostics software, make sure you install the device driver and the cards to be tested. Also, you should reboot your system with the `boot -r` command to reconfigure the system and allow the SunVTS kernel to recognize the new driver.

Note - You must run the `saiptest` in intervention mode.

The following minimum hardware configuration is required to successfully run the Internal test:

- PCI-based SPARC desktop system with a PCI slot
- Serial Asynchronous Interface card, installed in one of the PCI slots

The following hardware is also required to run other SunVTS Serial Asynchronous Interface tests:

- Serial Asynchronous Interface Patch Panel (Part No. 7600-0027)
- 25-pin serial loopback plugs (Part No. 540-1558)
- RS-232 serial cables (Part No. 530-1685)
- TTY terminal

saiptest *Options*

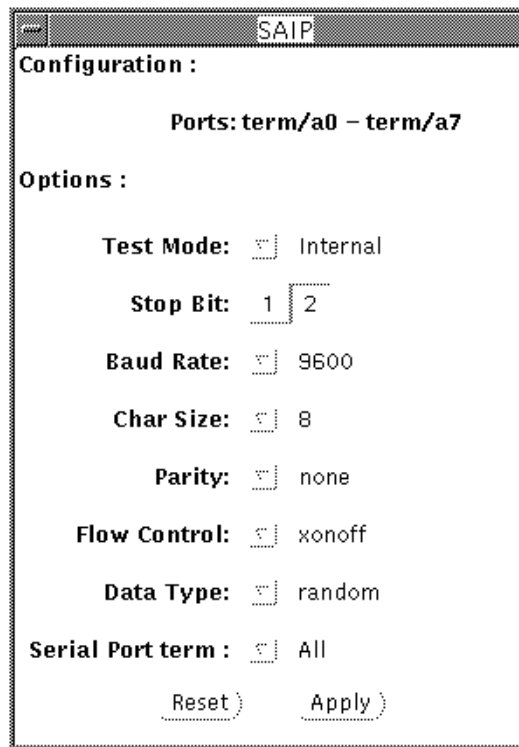


Figure 4-1 saiptest Options Menu

The Configuration section of the option menu displays the asynchronous serial ports available for the Serial Asynchronous Interface board. Table 4-1 shows the available ports.

Table 4-1 saiptest Asynchronous Serial Ports

Board Number	Board Device	Serial Ports
0	saip0	term/a000-a007
1	saip1	term/a008-a015
2	saip2	term/a016-a023
3	saip3	term/a024-a031

Table 4-1 saiptest Asynchronous Serial Ports (Continued)

Board Number	Board Device	Serial Ports
4	saip4	term/a032-a039
5	saip5	term/a040-a047
6	saip6	term/a048-a055
7	saip7	term/a056-a063
8	saip8	term/a064-a071
9	saip9	term/a072-a079
10	saip10	term/a080-a087
11	saip11	term/a088-a095

Table 4-2 saiptest Options

<code>saiptest</code> Options	Description
Internal Test	Performs internal loopback testing on the Serial Asynchronous Interface card(s) installed in PCI slots. You do not need to attach anything to the card(s) to perform this test
25-pin Loopback	Provides full-duplex transmission and full-modem loopback testing of the serial port selected in the Serial Port section of the option menu. You must attach the 25-pin loopback plug to the serial port on the Serial Asynchronous Interface Patch Panel that is being tested. This test cannot be run concurrently with the Echo-TTY option enabled.
Echo-TTY	Checks the proper operation of the serial port selected in the Serial Port selection of the option menu by echoing characters typed on a TTY terminal keyboard to the TTY terminal screen. Type anything on you TTY keyboard, and the characters you type should show up on the TTY screen. NOTE: A TTY connection to the Serial Asynchronous Interface serial port requires corresponding character size set up. For example, if a TTY attachment is running with 8-bit character size, then the Char Size <code>saiptest</code> option should be set to 8-bits. If you do not type anything within two minutes, this test will time-out.

Table 4-2 saiptest Options

<code>saiptest</code> Options	Description
Baud Rate	Specifies the baud rate; choose 110, 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400 baud. NOTE: The baud rate of 38400 can only be used if the Internal Test is disabled and you are testing one port at a time.
Char Size	Specifies the character length; choose 5, 6, 7, or 8 characters
Stop Bit	Specifies the number of stop bits; choose 1 or 2 bits
Parity	Specifies the selectable parity; choose none, odd, or even
Flow Control	Specifies the selectable flow control; choose XOnOff, rtscts, or both
Data Type	Specifies the selectable data type pattern; choose 0x55555555 (0x55), 0xaaaaaaaa (0xaa), or random
Serial Port	Specifies the serial port to be tested. The available ports are listed in the Configurations section at the top of the <code>saiptest</code> options menu

`saiptest` *Test Modes*

`saiptest` is only available in offline mode.

saiptest *Command Line Syntax*

```
/opt/SUNWvts/bin/saiptest standard_arguments -o dev=device_name,
M=test_mode,B=baud_rate,Size=character_size,Stop=#of_stop_bits,
Parity=parity,F=flow_control,Data=test_pattern,sp=serial_port
```

Table 4-3 saiptest Command Line Syntax

Argument	Explanation
dev=device_name	Specifies the asynchronous serial ports in PCI card slots (a000-a095) being tested. Since there is no default, you must type a device name--either a board (saip0-12) or an individual port (term/a000-term/a095): <ul style="list-style-type: none"> •saip0 = the 8 asynchronous serial ports in the first card •saip1 = the 8 asynchronous serial ports in the second card •saip2 = the 8 asynchronous serial ports in the third card •saip3 = the 8 asynchronous serial ports in the fourth card •saip4 = the 8 asynchronous serial ports in the fifth card •saip5 = the 8 asynchronous serial ports in the sixth card •saip6 = the 8 asynchronous serial ports in the seventh card •saip7 = the 8 asynchronous serial ports in the eighth card •saip8 = the 8 asynchronous serial ports in the ninth card •saip9 = the 8 asynchronous serial ports in the tenth card •saip10 = the 8 asynchronous serial ports in the eleventh card •saip11 = the 8 asynchronous serial ports in the twelfth card or /dev/term/a0mm Where <i>mm</i> is 0 to 95 (any of the asynchronous serial ports in PCI card slots)
M=test_mode	Specifies Internal, 25_pin_loopback, or Echo_TTY test mode
B=baud_rate	Sets the baud rate to 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400; the default is 9600
Stop=#of_stop_bits	Toggles the number of stop bits to 1 or 2; the default is 1
Size=character_size	Sets character size as an integer between 5 and 8
Parity=parity	Specifies the parity as none, odd, or even; the default is none
F=flow_control	Specifies flow control as xonoff, rtscts, or both
Data=test_pattern	Specifies test pattern as 0x55555555, 0xAAAAAAAA, or random
sp=serial_port	Specifies the terminal and asynchronous serial port number, such as term/a003

saiptest *Error Messages*

The saiptest error messages are generated when the SunVTS Serial Asynchronous Interface discovers errors. The error descriptions below identify probable causes for the card or test failure, and identify the Field Replaceable Unit (FRU), if possible. The three FRUs affected are: the Serial Asynchronous Interface card, the 78-pin shielded cable, and the Patch panel.

Table 4-4 saiptest Error Messages

Error Message	Probable Cause(s)	Recommended Action
6000	<error_message>	
6001	Expected = <value>, observed = <value>	
6002	Expected (<value>):	
6003	Observed (<value>):	
6004	Modem Loopback test failed on <device_name>	
6005	Off-line error on device <device_name>	
6007	Busy error on device <device_name>	
6008	Error on device <device_name>	
6009	Retry <number> exceeds limit <number> rc =s <value>	
6010	Expected <number> bytes, observed <number> bytes	
6011	Internal test failed on <device_name>	
6012	Data Loopback test failed on <device_name>	
6013	Ioctl TIOCSSOFTCAR error on <device_name>	
8000	Must provide device name!	

Table 4-4 saiptest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8001	No SAI/P card found or device driver not installed	
8002	Ioctl TCSETS failed on <device_name>	
8003	Open error on <device_name> - device driver may not be installed properly	
8004	Device <device_name> is already opened	
8005	Ioctl SAIP_ENLOOP error in <device_name>	
8006	Ioctl SAIP_DISLOOP error in <device_name>	
8011	Ioctl TIOCMGET failed on <device_name>	
8012	<device_name>: Expected DSR set, observed clear	
8013	<device_name>: Expected DSR clear, observed set	
8014	Ioctl TIOCMSET failed on <device_name>	
8015	Ioctl TIOCMBIC failed on <device_name>	
8016	Read error on <device_name>	
8017	Write error on <device_name>	
8020	Timeout error on <device_name>	No loopback plug Check Loopback plug
8021	Timeout error on <device_name>	tty terminal not connected Check tty terminal connected to device
8022	Timeout error on <device_name>	

Environmental Sensing Card Test (`sentest`)



`sentest` checks the SCSI Environmental Sensing card (SEN) installed in the SPARCstorage RSM to monitor the enclosure environment. The SEN card monitors the enclosure's over-temperature condition, fan-failures, power-supply failures, and drive activity. `sentest` utilizes the `uscsi` command interface to send requests and receive status information from the SEN card. `sentest` verifies the SEN card by first setting each control function to a predetermined value, and then reading it back to verify if the value is correct.

`sentest` verifies the following control functions in the enclosure:

- Alarm [enable/disable]: `sentest` toggles the alarm to the disable state, then to the enable state.
- Alarm time (0-0xff seconds): `sentest` sets the time (from 0 to 4096), then reads it back to verify the time setting.
- Drive fault LED (DL0-DL6): `sentest` toggles each LED to its OFF and ON states.

`sentest` is a nonscalable test. It cannot verify the setting correctly if another instance is changing the setting.

sentest *Options*

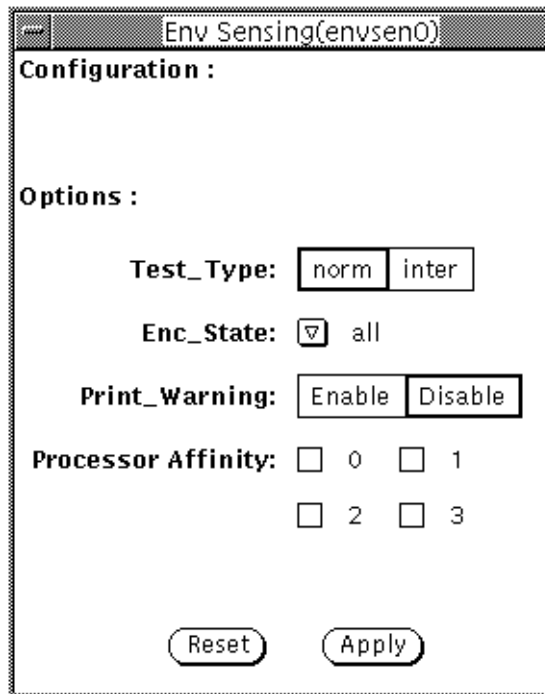


Figure 5-1 sentest Options Menu

Table 5-1 `sentest` Options

<code>sentest</code> Options	Description
Test Type	Specifies the test to be performed. <code>NORM</code> test type performs normal testing as alarm enable/disable, alarm time setting, and drive LED on/off testing; Interactive test type reports the current enclosure status
Enc_state	Specifies which subsystem's status in the enclosure is reported. Default is <code>ALL</code> . This test is only used with the <code>inter</code> test type and in Offline mode. The test options are: <ul style="list-style-type: none"> • Alarm enable/disable status • Drive present status • Drive LED status • Power modules status • Fan modules status • Over temperature, <code>abs</code> (abnormal, no immediate attention needed), <code>chk</code> (abnormal, immediate attention needed) status • All of above

`sentest` Test Modes

`sentest` supports all three modes. Each mode performs a different test scheme on the SEN card.

Table 5-2 `sentest` Test Modes

Test Mode	Description
Connectivity Mode	Checks the device connection by opening the device. If the device does not open, the device is not connected.
Online Mode	Performs the same test as Offline mode. <code>sentest</code> does not support interactive test types.
Offline Mode	Checks three components within the enclosure. It checks alarm enable/disable, alarm time setting, and the drive's LEDs. It does not test the power on/off function (only functions whose values can be changed are tested).

sentest *Command Line Syntax*

Table 5-3 sentest Command Line Syntax

/opt/SUNWvts/bin/sentest [*standard arguments*]
 -o dev=*interface*,[test=*type*],[enc=*component*]

Argument	Explanation
dev= <i>interface</i>	SEN card device name; the default value is ses0.
test= <i>type</i>	Specifies the test type; type Norm for normal testing or Inter for interactive testing; the default value is Norm.
enc= <i>component</i>	Indicates which part of the enclosure status is reported; the default value is ALL.

sentest *Error Messages*

Table 5-4 sentest Error Messages

Error Message	Probable Cause(s)	Recommended Action
6000 Check alenb failed, exp=<value>, obs=<value>		
6001 Check alenb failed, exp=<value>, obs=<value>		
6002 Check alenb failed, exp=<value>, obs=<value>		
6003 Check altime failed, exp time=<value>, obs=<value>		
6004 Fan failed		
6005 Dual fan failed		
6006 Enclosure over temperature		
6007 Device failed, need immediate attention		
6008 Power module A failed		
6009 power module B failed		

Table 5-4 sentest Error Messages (Continued)

Error Message	Probable Cause(s)	Recommended Action
8000	power module B failed	
8001	ioctl get state failed, errmsg=<message>	
8002	ioctl get state failed, errmsg=<message>	

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