

# **Dialogic Universal Hardware Diagnostics Guide**

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# 1. About UDD

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Universal Dialogic Diagnostics (UDD) is a diagnostic utility used for testing the functionality of Dialogic SpringWare hardware. The utility relies on configuration data used to download firmware to a board. Any Dialogic SpringWare board configured to operate in a system and supported by the current version of UDD will appear on the UDD Main screen.

UDD contains a list of tests that can be selected, deselected, and executed a specified number of times on each board. The tests available are specific to each type of board. For example, if you select the D/240SC-T1 board from the Main screen, only the tests specific to that board will appear on the Specify Tests screen.

The UDD utility is documented in this User's Guide, whether it is operating in a Windows or Linux environment. Information in this User's Guide refers to all supported operating systems unless stated otherwise. Refer to the product *Release Guide* for operating system-specific information.

- NOTES:**
- 1. For Windows:** Online help is available whenever the F1 key is pressed. Pressing F1 once will retrieve specific help for the current screen choice. Pressing F1 again will retrieve more general help.
  - 2. For Linux:** Online help is available using the mouse.

## 1.1. System Requirements

UDD requires the base Dialogic System Release Software for your operating system. Refer to the product *Release Guide* for more information.

For Linux only, the Sun Java 2 Runtime Environment, Standard Edition, version 1.3 is required for operation of UDD. This can be obtained from the <http://java.sun.com/j2se/> website.

## **1.2. Supported Boards**

Any Dialogic SpringWare board configured to operate in a system and supported by the current version of UDD will appear on the UDD Main screen. To be sure a board is supported in the current release, refer to the product *Release Guide*.

## **1.3. User Interface Considerations**

Selections are made using the mouse. In a Windows environment, shortcut keys can also be used by pressing the Alt key and the underlined letter of the screen selection. For example, “Run Tests” would be Alt-R. For more shortcut keys, refer to Table 2, “Main Screen Buttons”, on page 12 and Table 3, “Specify Tests Buttons”, on page 15.

In Linux, the Alt key is not a function, but may be simulated by pressing the Esc key. For example, to simulate Alt-X, press the Esc key and then the X key. To exit, press the Esc key twice.



## 2. Before You Begin

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This chapter provides information about preparing for, and starting the UDD utility. For information about UDD tests and their descriptions and parameters, proceed to Chapter 4, “UDD Test Descriptions”.

### 2.1. Installing UDD

The way you install UDD depends on your operating system environment. Refer to the *Software Installation Reference* that accompanies the software for UDD utility installation instructions.

### 2.2. Verifying Board Configuration Data

UDD relies on configuration data used to download firmware to a SpringWare board. Any Dialogic SpringWare board configured to operate in the system will appear on the initial UDD screen, providing it is supported by the UDD utility. Refer to the *Release Guide* for a list of supported boards.

**NOTE:** Update the SpringWare configuration files, if necessary, as described in the Dialogic Software Installation Reference before starting the UDD utility.

The method used to record configuration data depends on your operating system and the base package installed on your system. Refer to the product *Release Guide* or the *Software Installation Reference* for more information about configuration data.

### 2.3. Preparing to Start UDD

Before starting UDD, be sure that:

1. The Dialogic System Release Software and SDK is properly installed.
2. All active applications on any of the Dialogic boards in the system are stopped.

## **2.4. Starting UDD**

The method used to start UDD depends on the operating system environment. Refer to the following guidelines:

<b>Operating System</b>	<b>Method</b>
Windows	From the Dialogic System Software program folder, click <b>Universal Dialogic Diagnostics Utility</b> .
Linux	From the command line, execute <code>usr/dialogic/bin/udd</code> . This command runs the UDD.

Refer to the product *Release Guide* for more information.

### **2.4.1. Startup Message**

When UDD starts, version information is displayed followed by the UDD initialization screen.

Any Dialogic SpringWare board configured to operate in the system and supported by the current version of UDD will appear on the initialization screen. Refer to the *Release Guide* for a list of supported boards.

### **2.4.2. Error Messages**

An error message will appear if a problem prevents the UDD utility from starting. Possible error messages are listed in Table 1.

**NOTE:** Unless indicated otherwise, UDD will exit immediately if one or more of the messages listed in Table 1 is returned.

**Table 1. Error Messages**

<b>Message Returned</b>	<b>Possible Cause/Solution</b>
No supported or downloadable boards found in current configuration.	No boards in the system. Configuration data exists, but was not found or failed to download.
Cannot determine product for board pair: board ID = <number>, daughter ID = <number>	The board product IDs read from the EEPROMs do not match a known or supported product. This may indicate a board failure. Contact the RMA Coordinator for further help (see Chapter 6, “The Return Material Authorization (RMA) Process”). If any board in the system does not have this problem, UDD will continue.
Cannot send command to <board name>. Cannot read EEPROM for <board name>.	Unable to communicate with the board. Check the hardware and software configuration. If any board in the system does not have this problem, UDD will continue.
Cannot find file: <filename>.	A required file was not found. Verify that all required packages are installed.
Environment variable <variable name> is not set.	The environment variables DLFCGPATH and DLFWLPATH are used by UDD to locate files. These variables are often set in <i>CONFIG.SYS</i> when you install other required Dialogic software. To verify that they are currently set, type “set” to list variables and their values.
The messages shown in this table will appear on the screen, but will not be listed in the log file.	

**Table 1. Error Messages (Continued)**

<b>Message Returned</b>	<b>Possible Cause/Solution</b>
Cannot access board. Skipping these boards. Boards must be stopped before running this program. Press Enter to continue.	An application is running or the system cannot communicate with the board. Stop the boards before starting UDD.
Cannot open: <configuration data>	Incorrect <i>DIALOGIC.CFG</i> file or registry entry. Unable to open the configuration data.
<configuration data>: invalid line: <line #>	Check the configuration data.
Unknown board type specified for <board>	Unknown/unsupported board. If any board in the system does not have this problem, UDD will continue.
The messages shown in this table will appear on the screen, but will not be listed in the log file.	

**Table 1. Error Messages (Continued)**

<b>Message Returned</b>	<b>Possible Cause/Solution</b>
<p>Download of system failed followed by one of the following:</p> <p>Fatal error opening boot file.            Error reading boot file.            Unable to open GENBOOT.FWL.            Unable to open firmware file.            Old format or corrupted firmware file.</p> <p>GENBOOT.BIN is version 1.10 or earlier.</p> <p>GENBOOT not responding on board <i>xx</i>.            GENBOOT failed on board <i>xx</i>.            Failed to initiate GENBOOT download.            Failed to start firmware download of diagnostics firmware.</p>	<p>Messages of this type indicate the following:</p> <p>A corrupt file or nonexistent file.</p> <p>GENBOOT version is too old.</p> <p>No communication with product.</p>
<p>No supported or downloadable boards found in current configuration data.            UDD Exiting.</p>	<p>The system cannot find boards. Check configuration data.</p>
<p>The messages shown in this table will appear on the screen, but will not be listed in the log file.</p>	

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## 3. Using the UDD Utility

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This chapter provides information about using the various features of the UDD utility. For information about UDD tests and their descriptions and parameters, proceed to Chapter 4, “UDD Test Descriptions”.

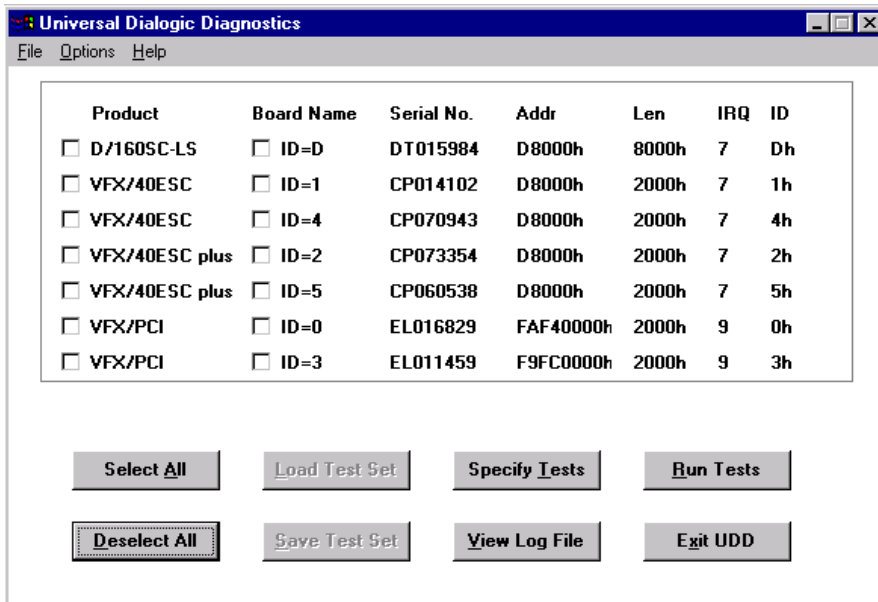
### 3.1. Using the UDD Utility

When you start UDD, a Start-up screen with the version and copyright information appears. For Windows, UDD will then display a warning that all Dialogic SpringWare boards will be stopped. For all operating systems, however, all the Dialogic SpringWare boards are stopped so that the UDD test firmware can be downloaded to the boards. For Windows, respond by pressing the Continue button on the Warning dialog to continue; otherwise, the UDD utility will exit.

An initialization screen appears next which displays information as the Dialogic SpringWare boards are found and the test firmware is downloaded. (This information actually comes from the UDD initialization log file, *uddinit.log*. This file is located in `/usr/dialogic/dog` for Linux systems; for Windows systems, use the Find Files utility to find the *uddinit.log* file.) You can scroll through this screen if needed. This screen will be covered by the UDD Main screen, but is available for viewing until you click OK to close it.

The Main screen appears when the downloading is done. The Main screen appears similar to the one illustrated below.

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The Main screen displays all Dialogic boards currently configured in the system. Use the scroll bar, if necessary, to scroll through the complete list of boards. At the bottom of the screen are buttons for selecting screen options. Use the mouse or Tab key to select screen elements.

**NOTE:** Text that exceeds the field width will display “. . .” to indicate more text is available. Put the mouse cursor over the field to view the hidden text.

### 3.2. Board Information

The Main screen displays the following information about each board:

**Product** Dialogic product name.



<b>Board Name</b>	The name given to the board in configuration data, ID= <i>xx</i> , where <i>xx</i> is the board number or address. Note that baseboard, daughterboard, dual board, and dual daughterboard have their own ID.
<b>Serial No.</b>	Board serial number.
<b>Addr</b>	Base shared RAM address.
<b>Len</b>	Length of shared RAM.
<b>IRQ</b>	Valid hardware interrupt level.
<b>ID</b>	Board locator number. H represents hexadecimal (daughterboard id = baseboard id + 20Hex). For D/41D boards, the board ID is the base shared RAM address.

### 3.3. Menu Options

The UDD Main screen contains the following menu selections:

<b>Menu Item</b>	<b>Action</b>
File -> Exit	Exit the UDD utility
Options -> Log Test Results	Create a log file for test results
Help -> UDD Help	Display online help for the Main screen
Help -> About	Displays the UDD version and copyright information

### 3.4. Button Options

The UDD Main screen consists of the buttons shown in Table 2. Use the mouse to navigate the Main screen.

**Table 2. Main Screen Buttons**

<b>Button</b>	<b>Action</b>	<b>Windows Shortcut Key</b>
Select <u>A</u> ll	Selects all boards listed on the Main screen.	Alt-A
<u>D</u> eselect All	Deselects any boards currently selected.	Alt-D
<u>L</u> oad Test Set	Not supported.	Alt-L
<u>S</u> ave Test Set	Not supported.	Alt-S
Specify <u>T</u> ests	Specifies which tests to run by displaying a Test Selection screen (one for each board selected).	Alt-T
<u>V</u> iew Log File	Displays a log file of test results if logging was enabled. For more information, refer to Section 3.5, “Generating a Log File”, on page 12.	Alt-V
<u>R</u> un Tests	Executes all selected tests.	Alt-R
<u>E</u> xit UDD	Exits the UDD utility. Wait for UDD to terminate completely before proceeding with an application.	Alt-X

### **3.5. Generating a Log File**

A log file, `udd.log`, can be used to store UDD test results. For Windows, the log file is **not** generated by default. To generate a log file of test results, use the mouse to select “Log Test Results” from the Options menu off the Main screen toolbar. For Linux, the log file is generated by default, but can be enabled or disabled in the Options menu. This log file is located in `Program Files\Dialogic\Bin` for Windows or `/usr/dialogic/log` for Linux.

### **3.6. Selecting a Board**

To select a board, click the box next to the name of the board you wish to test.

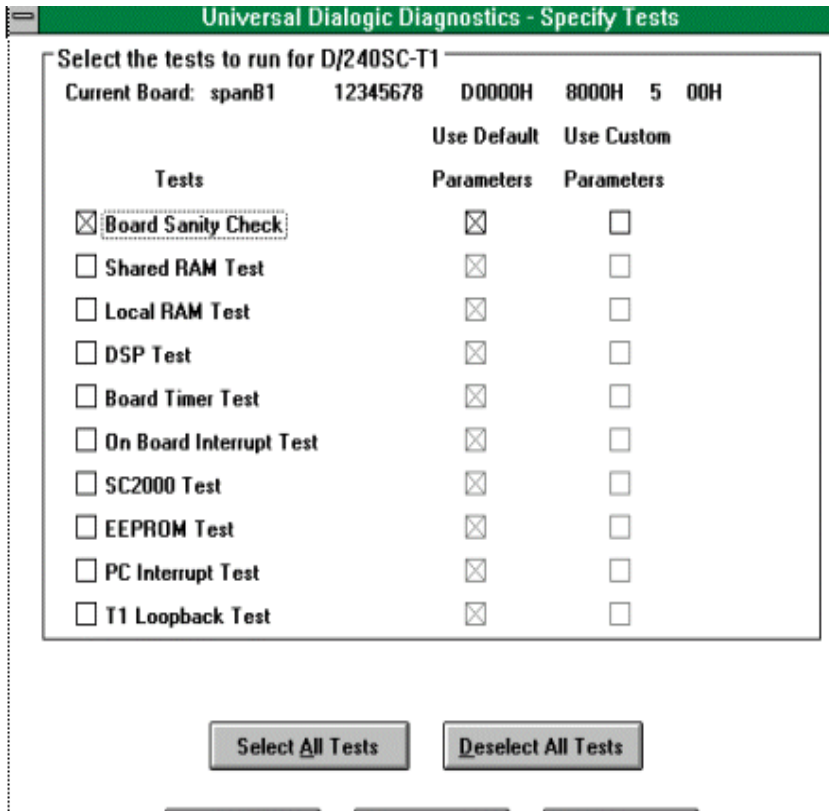
### ***3. Using the UDD Utility***

When a board is selected, a check mark will appear in the box next to the board and the Specify Tests screen will appear. If you want to select more boards, bring the Main screen to the front. Select all of the products and boards you wish to test before you specify the tests to run on the boards.

You may select either a product name or individual board. If you select a product name, each board (daughterboard or dual board) that is part of the product will be selected automatically. If the board was not already selected, a check mark will appear to the left of the product name when you click that box. If the board was previously selected, clicking the box again will deselect it and the check mark will disappear.

#### **3.7. Specify Tests**

When you select “Specify Tests” from the Main screen, a Specify Test screen is displayed for each selected board. For a full description of UDD tests and applicable parameters, see Chapter 4, “UDD Test Descriptions”.



The buttons available on the Specify Tests screen are listed in Table 3.

**Table 3. Specify Tests Buttons**

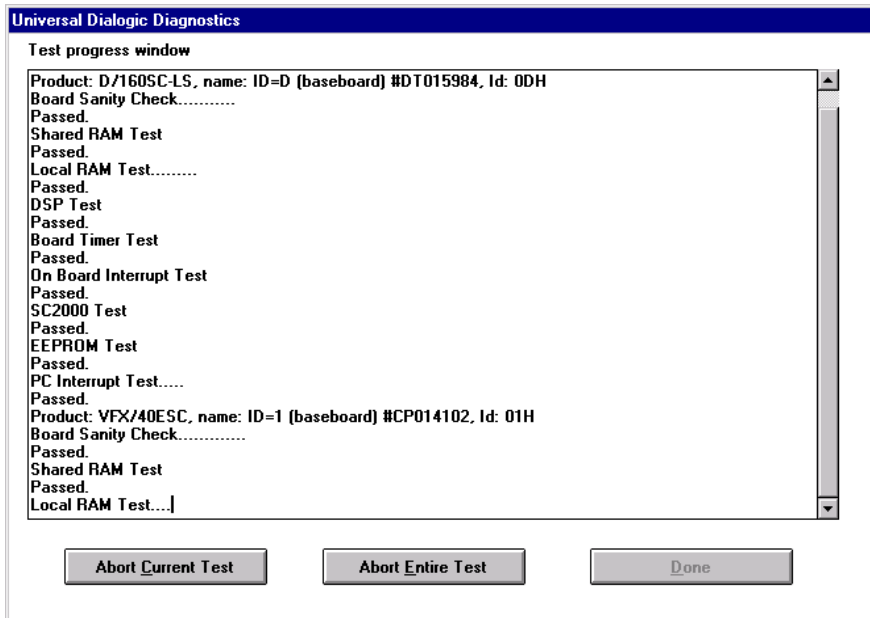
<b>Menu Option</b>	<b>Action</b>	<b>Windows Shortcut Key</b>
Select <u>A</u> ll Tests	Selects all tests specific to a selected board. There is an option to set test parameters for each test. Test parameters are set by selecting either “Use Default Parameters” or “Use Custom Parameters” column from the Specify Tests screen.	Alt-A
<u>D</u> eselect All Tests	Deselects any tests currently selected. This option does not reset any parameters.	Alt-D
<u>O</u> K	Returns to the Main screen after tests have been selected for a specific board.	Alt-O
<u>C</u> ancel	Returns to the Main screen before all tests have been selected.	Alt-C
<u>H</u> elp	Activates context sensitive online help.	Alt-H

To specify which test(s) to run, click in the box next to a specific test or click “Select All Tests”. To deselect tests, click in the box next to a specific test or click “Deselect All Tests”. To set parameters (such as the number of iterations), click “Use Custom Parameters”.

After tests are specified for all boards, you must select OK in order for UDD to return to the Main screen.

### 3.8. Run the UDD Tests

As tests run, a Test Progress screen appears as shown below. It indicates the product being tested, the specific test name, and the status of the test.



In Windows, dots across the screen indicate continuing progress. Selecting all tests for multiple boards can take several minutes to run. When all tests are run:

- If successful, the Done button is enabled, the Abort buttons are disabled and the text “no errors found” appears.
- If any failure occurs, a new screen appears displaying information about the failed board(s). Click the Details button on this screen to view the details about the failed board(s).

### **3.9. Abort Tests**

You may choose to abort a test while a test run is in progress. To abort the current test, click “Abort Current Test” from the test progress screen. To abort all tests, click “Abort Entire Test”. An “Aborting test. Please wait...” message will appear on

the screen regardless of the abort option chosen. The final status of the test will be shown as “\*\*ABORTED\*\*”.

#### 3.10. Monitoring Test Status

A test will result in one of the following outcomes:

- PASS indicates successful completion of all iterations.
- FAIL indicates a failure when running a test. (The test ends when the first failure occurs.)
- REJECTED indicates a failure during test initialization.
- ABORTED indicates the user aborted a test.

Upon completion of all tests, a test results screen indicates the product name, test type, and a test result message, for example, FAILED or REJECTED. To receive more information regarding failures, click “Details”.

**NOTE:** No details are given for PASS or ABORTED results.

#### 3.11. Ending a UDD Session

When you are done with the UDD session, click Exit UDD from the Main screen. You will have to run *dlstart* to download the Dialogic firmware to the boards and start the boards up.

The log file is written over upon restarting UDD. Therefore, if you want to save the results, rename the log file.

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## 4. UDD Test Descriptions

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This chapter describes the tests that make up the UDD utility. Because UDD tests are specific to each board type, the tests listed in the Test Selection screen will vary with the type of board selected.

Consult the product *Release Guide* to determine which boards are supported by this version of UDD.

### 4.1. Board Sanity Check

The Board Sanity Check tests the basic functionality of the board. This test includes short versions of the Shared RAM, Local RAM, DSP, EEPROM, and Board Timer tests.

#### Parameters

Number of Iterations    Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### 4.2. Shared RAM Test

The Shared RAM Test verifies the available memory shared between the host and the board selected.

#### Parameters

Number of Iterations    Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### **4.3. Local RAM Test**

The Local RAM Test checks the local memory of the control processor on the selected board.

#### **Parameters**

Number of Iterations	Decimal number indicating the number of times the test will be executed. Default: 1 Valid Range: 1 to 32767
Starting Address	Zero-based hexadecimal value of the address in Local RAM where the memory test will be started. Default: minimum offset allowed (0x10000 on D/xxxSC) Valid Range: 0x10000 to 0xDFFFF
Number of Bytes	Hexadecimal number defining the number of consecutive bytes in tested memory, starting from Starting Address. Default: 0xD0000 Valid Range: 1 to 0xD0000

### **4.4. DSP Test**

The DSP Test verifies the board's Digital Signal Processing (DSP) subsystem. This test checks DSP memory, interrupts between the DSP and the control processor, and the DSP's crystal speed rate.

#### **Parameters**

Number of Iterations	Decimal number indicating the number of times the test will be executed. Default: 1 Valid Range: 1 to 32767
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Select DSP                      Check box to select DSP X and/or DSP Y. If the board has only one DSP, the DSP X box is checked and both DSPs are greyed out.

### 4.5. Board Timer Test

The Board Timer Test checks the functionality of the control processor's Timer 2 channel on the selected board.

#### Parameters

Number of Iterations      Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### 4.6. Onboard Interrupt Test

The Onboard Interrupt Test checks the functionality of the local interrupt system on the selected board.

#### Parameters

Number of Iterations      Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### 4.7. SC2000 Test

The SC2000 Test applies only to boards having SC2000 circuitry. SC2000 circuitry supports the SCbus, which is the hardware pathway used for communication among Dialogic boards. The SC2000 test verifies SC2000 circuitry by performing a data loopback test, where data is transmitted from a DSP, looped back through the SC2000, and validated by the DSP.

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### **Parameters**

Number of Iterations     Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### **4.8. EEPROM Test**

The EEPROM Test verifies the selected board's ability to read the Electronically Erasable Programmable Read Only Memory (EEPROM). A board uses this memory to store configuration data.

### **Parameters**

Number of Iterations     Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### **4.9. PC Interrupt Test**

The PC Interrupt Test checks the board's ability to generate interrupts to the PC. As the board generates interrupts, the host counts them and verifies that the correct amount has been generated.

### **Parameters**

Number of Iterations     Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

### 4.10. T1 Loopback Test

The T1 Loopback Test applies to boards having a T-1 front end. This test uses the front end set to local loopback on boards with a T-1 digital network interface to perform signaling and data loopback tests. It is a stand-alone test and does not require any other network interface boards or external loopback connector.

#### Parameters

Number of Iterations	Decimal number indicating the number of times the test will be executed. Default: 1 Valid Range: 1 to 32767
Signaling Test	The DSP generates signaling information and verifies that it receives the same signaling information. The signaling test is run four times, alternating the possible patterns for the A and B signaling bits (for example, AB = 00, 01, 10, 11). Default: run test on all time slots Valid Range: 1 to 24
Data Test	Generates a data pattern in the DSP and then verifies that the DSP received the correct data. Default: run test on all time slots Valid Range: 1 to 24

### 4.11. E1 Loopback Test

The E1 Loopback Test applies to boards having an E-1 front end. This test uses the front end set to local loopback on boards with an E-1 digital network interface to perform signaling and data loopback tests. It is a stand-alone test and does not require any other network interface boards or external loopback connector.

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### **Parameters**

Number of Iterations	Decimal number indicating the number of times the test will be executed. Default: 1 Valid Range: 1 to 32767
Signaling Test	The DSP generates signaling information and verifies that it receives the same signaling information. The signaling test is run twice. Default: run test on all time slots Valid Range: 1 to 32
Data Test	Generates a data pattern in the DSP and then verifies that DSP received the correct data. Default: run test on all time slots Valid Range: 1 to 32

## **4.12. LS Frontend Test**

The LS Frontend Test applies to boards having a loop start front end. The LS Frontend default parameters test Dual Subscriber Line Audio-processing Circuits (DSLAC) by programming each DSLAC channel and verifying that the correct information was written. Tones are also played and verified on each DSP channel. This is a stand-alone test and does not require other network interface boards or an external loopback connector.

### **Parameters**

Number of Iterations	Decimal number indicating the number of times the test will be executed. Default: 1 Valid Range: 1 to 32767
Analog Test	Tests the DSLACs in analog loopback mode. Default: run the test on all channels Valid Range: 1 to 16

## 4. UDD Test Descriptions

Digital Test                      Tests the DSLACs in time slot assigned loopback mode.  
Default: run the test on all channels  
Valid Range: 1 to 16

### 4.13. NS Hardware Test

The NS Hardware Test applies to boards having 8031/80188 interrupts and an XILINX chip. The NS Hardware test verifies the Northern Telecom interface on the NS daughterboard of the D/42-NS board. It first tests the 8031/80188 mailbox and shared RAM, and then tests the C-84 chip set, which interfaces the NS daughterboard to the PBX.

#### Parameters

Number of Iterations          Decimal number indicating the number of times the test will be executed.  
Default: 1  
Valid Range: 1 to 32767

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# 5. Troubleshooting

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This chapter provides troubleshooting information.

## 5.1. Troubleshooting Checklist

An installation oversight often creates a problem in an assembled system or testing setup. When isolating a problem, check the physical equipment first. If problems continue, confirm that:

- All boards are firmly seated and secured in their PC expansion slots.
- Daughterboard modules are firmly seated on the baseboard.
- For Linux, confirm that the Sun Java 2 Runtime Environment, Standard Edition, version 1.3 is installed.
- The IRQ setting of the board you suspect has a problem does not conflict with other expansion boards in your system.
- Each ISA/BLT or hardware configurable board has a unique board locator number or shared RAM address.
- The configuration data is correct.
- The Dialogic System Release Software and SDK is properly installed.
- The UDD software is properly installed.

A known good board can be used to verify that the UDD software has been installed properly.

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## 6. The Return Material Authorization (RMA) Process

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If there is a problem with your board after running UDD, you can return the board to Dialogic for service. The following sections outline the procedures that make up the Return Material Authorization (RMA) Process.

### 6.1. Before You Call

Before calling Dialogic to return a board, check to see if the problem is due to a mistake or oversight in the installation process. (For more details, refer to the troubleshooting checklist in Chapter 5, “Troubleshooting”.)

Please be sure to have the log file of UDD test results and the board serial number handy when you call. This serial number is an alphanumeric code (for example, CZ001000) located on a label attached to the board.

### 6.2. Contacting Dialogic

Contact the Dialogic RMA Coordinator by calling (973) 993-3000 x6374. Telephone lines are open from 9 a.m. to 5.30 p.m. EST.

The RMA Coordinator will ask you for the board serial number and a brief description of the problem. After gathering this information, the RMA Coordinator will process your return request, provide you with an RMA number, and tell you if the board is still under warranty. Boards under warranty are repaired free of charge (you must pay for shipping). For boards not under warranty, you will be charged a flat repair fee.

### 6.3. Returning the Board and Test Results

Repack the board, observing correct static-handling procedures. (Refer to the appropriate *Quick Install* card for static-handling procedures.) Place the board in an

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anti-static package and then put it in a shipping carton using appropriate packing material. Use the original shipping materials if possible.

If you are shipping the board to Dialogic, you agree to insure the board or assume the risk of loss or damage in transit. The address of our office is:

Dialogic, an Intel company  
1515 Route 10  
Parsippany, New Jersey 07054

We recommend shipping the board by a service such as Federal Express or UPS Second Day Air Service. These services generally handle packages more carefully. Not only is there less danger of in-transit damage, but delivery is faster as well.

Be sure to write the RMA number on the outside of the box you are shipping (for example, RMA #2201) and send the package to the attention of the RMA number assigned.

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