Operating Manual

DLS 1100 Software

Revision 2 - Draft
November 2002

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1. Introduction

Thank you for choosing Spirent.

DLS Division has been in the wireline simulation business for over 20 years. Since the days of the S2, DLS Division has designed many new simulators both to customers' specifications and to conform to an ever-growing range of standards. By introducing the DLS 100 in 1985 we believe that we sold the world's first truly wideband wireline simulator with the capability to successfully simulate attenuation, characteristic impedance and delay.

The Spirent DLS 1100 series is a Windows based software package designed for easy and flexible control of Spirent Wireline Simulators using IEEE 488 or RS-232 (serial) interfaces. The strength of the program lies in its inherent ability to control multiple simulators with the same ease as it does individual simulators.

1.1 Disclaimer of Warranty

Spirent Communications makes no representations or warranties, either express or implied, by or with respect to anything in this document, and shall not be liable for any implied warranties of merchantability or fitness for a particular purpose or for any indirect, special or consequential damages.

1.2 About the DLS 1100 Series Software

DLS 1100 Series is a software package which runs on a PC using a version of the Windows operating system and is used for controlling Spirent Wireline Simulators. Please check the DLS 1100 release notes installed along with the DLS 1100 software to confirm which Windows platforms your version of the DLS 1100 software supports. The DLS 1100 software communicates with various wireline and noise simulating units by using RS-232 connections or an IEEE bus. The DLS 1100 configures these units by sending and receiving data from them and by querying their status. The information transmitted to and from the units is generated on the GUI (Graphical User Interface) interface, or is loaded from disk files.

Please consult the DLS 1100 release notes for a list of supported products for which the version supports.

Please ensure that your unit has Firmware Version 8A4296 or above in order to operate with the DLS 1100 system. If it does not, please contact Customer Service for details on upgrade availability.

Below is a brief description of some Spirent DLS Wireline Simulators and what each unit does:

DLS 5A00 – The DLS 5A00 is a noise and impairment generator for Spirent Communications DLS Division DLS 400 family of wireline simulators. It consists of a plug-in card and associated software. The DLS 5A00 offers downloadable noise shapes, allowing for the addition of many new shapes as standards change.

DLS 5A01 – The DLS 5A01 is a next generation impairment generator module, which provides narrow and broadband noise, crosstalk and transient impairments, used for testing ADSL, SDSL, HDSL2 and ISDN. The DLS 5A01 offers all of the capacity of its Noise Impairment Module (NIM) predecessor in addition to refined noise shape and additional noise shape generation capacity.

DLS 400E – The DLS 400E simulates various Types, lengths and configurations of twisted pair telephony cable in order to test ADSL and other wireline technology based products. DLS 400E also simulates impairments, such as noise impulse in order to determine the margin upon which this technology will operate.

DLS 400HE – The DLS 400HE is a two wire ETSI HDSL / ETSI SDSL / ITU-T G.shdsl cable simulator which can be equipped with up to two xDSL DLS 5A01 Impairment Generator Modules. Hardware implication is a 3 chassis system.

DLS 400HE1 – A pre configured version of DLS 400E, designed to provide an effective partial or compete solution for the simulation of ETSI HDSL & SDSL. This product has a testloop based simulation strategy, which covers testloops 1-4,6 & 7. Hardware implication is a 1 chassis system.

DLS 400HE2 – A pre configured version of DLS 400E, designed to provide an effective partial or compete solution for the simulation of ETSI HDSL & SDSL. This product has a testloop based simulation strategy, which covers testloop 5 only. Hardware implication is a 2 chassis system.

DLS 400A – DLS 400A simulates a single twisted-pair cable, and up to 2 optional impairments cards. The user can select the simulated loop and the length of the variable loops using the IEEE 488 or RS-232 interface.

DLS 400HN – The DLS 400HN is the Spirent Communications DLS Division simulator that addresses the growing xDSL market. As with its predecessor, it simulates industry standard test loops to evaluate the performance of xDSL technologies. The unit is available in 3 models, each covering a different loop set:

DLS 400H: Simulates all loops necessary for testing to ANSI HDSL and HDSL2 specifications.
DLS 400N: Simulates all loops necessary for testing to North American ADSL specifications, covering both ANSI and ITU G.Lite loops.
DLS 400HN: Combines the loops of both the DLS 400H and the DLS 400N into one single chassis.

DLS 6100 – The DLS 6100 is a wireline simulator with a bandwidth required for ADSL testing. The DLS 6100 can be used to simulate the characteristics of real cable and is offered in a convenient package.

DLS 6200 – The DLS 6200 is a cost-effective solution for testing Central Office equipment such as DSLAM and other high port density applications. DLS 6200 offers multiline simulation up to 24 lines in a single chassis. The DLS 6200 affords low cost per line and uses a fraction of the rack or bench space that is required for multiple single line simulator.

DLS 90 – The DLS 90 reproduces the characteristics of twisted PIC telephone cable for testing access products designed to operate on the local loop.

DLS 8100 – The DLS 8100 is designed specifically for testing VDSL equipment up to 30 MHz, the DLS 8100 is capable of providing the necessary bandwidth, along with full simulation of propagation delay, phase and attenuation effects.

DLS 8200 – The DLS 8200 is designed specifically for testing ETSI VDSL equipment. The DLS 8200 is the only product on the market capable of providing the necessary high bandwidth up to 300MHz, along with full and accurate cable loop simulation.

DLS 5101 – The DLS 5101 generates shaped narrow and broadband noise, crosstalk and transient impairments for testing local loop copper access products. The DLS 5101 simulates the noise and other impairments needed to test ADSL, G.Lite, HDSL, ISDN and HDSL2.

DLS 5102 – The DLS 5102 is the Japanese ADSL, HDSL and ISDN Noise Generator. The 5102 simulates a variety of impairments which can be used to test according to ANSI, ITU and ETSI Standards.

DLS 5103 – This is the DLS 5101 with the DLS 5A01 Noise Impairment Generator Module installed.

DLS 5104 – This is the DLS 5102 with the DLS 5A01 Noise Impairment Generator Module installed.

1.3 Components of the DLS 1100 Series Software

The DLS 1100 software is comprised of three main elements (see Figure 1):

1. Communications through RS-232 or IEEE 488
2. Graphic User Interface (GUI), using Microsoft Windows 95, with Internet Explorer 5.0 or higher
3. Disk File Management

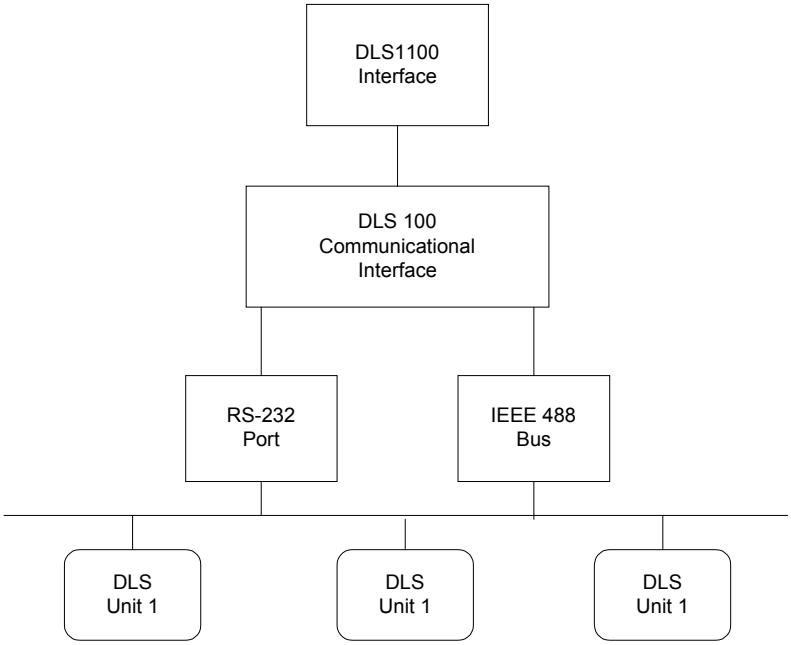


Figure 1 - DLS 1100 Configuration

1.4 Features of the DLS 1100 Software:

A complete list of product features is summarized below:

- Control of Spirent DLS produced simulators which are capable of remote control operation
- Auto-detection of Spirent DLS wireline simulators and impairment generators.
- Allows user-defined system configurations incorporating multiple and different Spirent DLS simulators
- Terminal / Monitor using Serial and GPIB communication
- Dynamically updated Graphic Diagrams
- Capability to work with different types of files in any directory available to the computer. The program is structured as a core executable that uses DLL's that provide support for different units and systems.
- Pre-configured loop settings based on the recent international standards.

1.5 Basic Controls for the DLS 1100

Please note that the DLS 1100 software allows you to use your right click mouse button anywhere on the unit's image. By doing this, the user can easily change parameters of the unit such as connection type and its position in the wireline. Please see Section 3, Operation, for a complete DLS 1100 Series operation overview.

2. Getting Started

2.1 Installing the DLS 1100 Series software

The DLS 1100 software is provided to you on CD-ROM

On a PC with Windows and Internet Explorer version 5 or later, run the executable file Setup.Exe on the DLS 1100 software CD-ROM. The DLS 1100 software Setup Wizard will guide you through the setup of the software.

2.2 CPU and OS Requirements

The DLS 1100 Series software will run on any PC running Windows 95™ and with Internet Explorer 5.0 or higher installed. The system must have an IEEE 488 Bus and a National Instruments driver installed, and/or a Serial port. Future releases will support more Windows platforms. Please check the read me file on the CD-ROM to confirm the range of Windows platforms the version you have supports.

Please go to the customer extranet site located in the support section of the website: www.spirentcom.com for information on the latest version of the DLS 1100 software.

Please read the release notes that can be found in the DLS 1100 release notes on the CD-ROM for any updates in CPU or OS requirements.

2.3 Installing National Instruments GPIB Software (IEEE 488 operation only)

1. From the Windows Start Menu, select “Settings” > “Control Panel”.
2. In the control panel, select “Add/Remove Programs”.
3. Click on the “Install” button, and then “Next”.
4. Insert the first installation disk of the GPIB Software for Windows 95 (NI–488.2M software) in drive A, select “Next”, then “Finish”.
5. The National Instruments GPIB setup will begin, and a “GPIB Setting Options” screen will appear. Select the first option (Install NI–488.2M Software for Windows 95), and follow the instructions to install the software.

2.4 Installing the GPIB–PCII/IIA Card (IEEE 488 operation only)

1. From the Windows Start Menu choose “Settings” > “Control Panel”, followed by “Add New Hardware”. Click on the “Next” button to start the process. Windows will ask if it should search for new hardware; choose “No” and click on “Next”.
2. A hardware list will appear, choose “Other Devices” (towards the bottom of the list), and click on “Next”.
3. Choose National Instruments, and the appropriate card (GPIB PC–II) and click on “Next”.
4. Windows will show some arbitrary card settings for IRQ, DMA, and Input/Output Range Settings. Click on “Next” to accept these settings, and then select “Finish” on the following screen.
5. Answer “No” when asked if you wish to re-start your computer.

6. From the Start Menu, select "Settings" > "Control Panel" > "System". Select the GPIB–PCII under Device Manager by clicking on the icon.
7. Click on "Resources" to view the resource settings. Write down the resource settings.
8. Re-start your computer.
9. Prepare your GPIB–PCII/IIA card for installation by configuring it for GPIB–PCII mode and 7210 mode (the default setting).

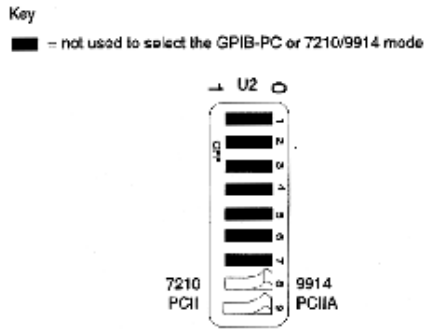


Figure 2 - Configuring the GPIB-PCII/IIA Card

10. The manufacturer's default resource settings for GPIB–PCII mode are:

Base I/O Address	02B8–02BF
Direct Memory Access	DMA Channel 1
Interrupt Level	IRQ 7

Compare the above settings with the settings you wrote down in step #7. If the settings are the same, nothing needs to be done to the card and it can simply be inserted into the computer slot. If the settings are different, the GPIB–PCII/IIA card's jumper and switches must be moved to match the resource settings assigned by Windows®, before installing the card. For details, see the National Instruments book that comes with the NI card, "Getting Started with your GPIB–PCII/IIA and the GPIB Software for Windows 95".

2.5 How to Check if the NI Card is Installed Properly

Check that the PC–II card is installed correctly by running the hardware diagnostic program. From the Windows 95 Start menu, select "Programs" > "NI–488.2M Software for Windows" > "Diagnostic". Click on "Test All". If the diagnostic fails, or the GPIB card is not found, make sure that the settings on the card match those specified in the Device Manager. If the diagnostic is successful, click "Exit" to return to Windows 95.

2.6 Configuring Windows/National Instruments GPIB card

This instruction assumes that you have already installed your National Instruments IEEE-488 interface card and associated drivers for Windows. If you are not sure how to do either, please consult your manual that came with your National Instruments card. This document deals with issues that are particular to using DLS Division's equipment with the National Instruments IEEE-488 interface card.
Select "Start" > "Settings" > "Control Panel". Double click on "System", and click on the "Device Manager" tab:

Double click on National Instruments GPIB Interfaces, then select the appropriate card. Click the Resources tab, and check each parameter to ensure there are no conflicts. Note that the example shown is for a GPIB-TNT+ card. For GPIB-PCII the address defaults to 02B8h (unless DIP switches are changed), and IRQ 7 and DMA 1 are set by jumpers.

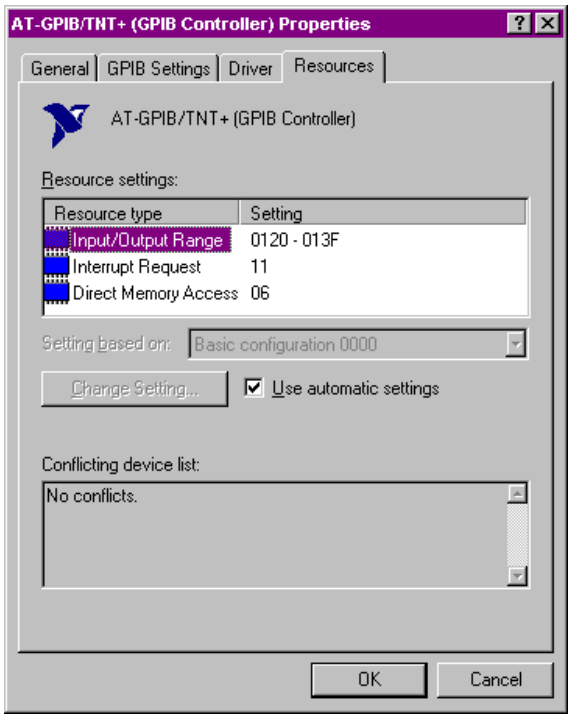


Figure 3 - AT-GPIB/TNT + (GPIB Controller) Properties Window

Choose GPIB settings tab:

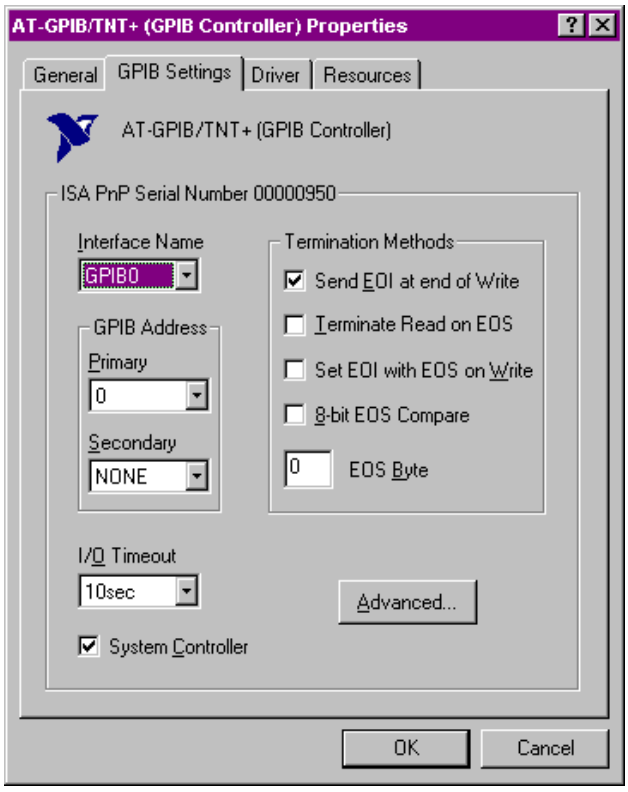


Figure 4 - GPIB Settings Tab

Click Advanced.

Set as follows:

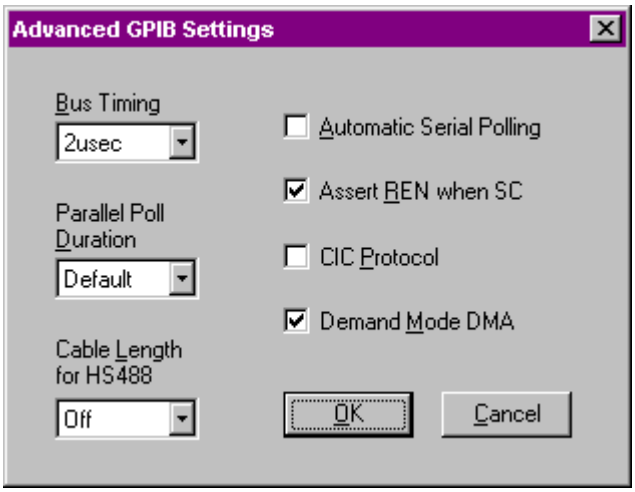


Figure 5 - Advanced GPIB Settings

Ensure that the Automatic Serial Polling selection is turned OFF. Otherwise you will experience erratic and unreliable behaviour when communicating with your equipment using the IEEE-488 bus.
Press “OK” for all screens, then exit the Control Panel.
At this point you should be able to control your DLS Division equipment using the National Instruments IEEE 488 interface.

2.7 Starting the DLS 1100 Software

To start the DLS 1100 Control Software, select “Start” > “Programs” > “DLS 1100 Software” from the menu of programs. The program will start and display the following screen:

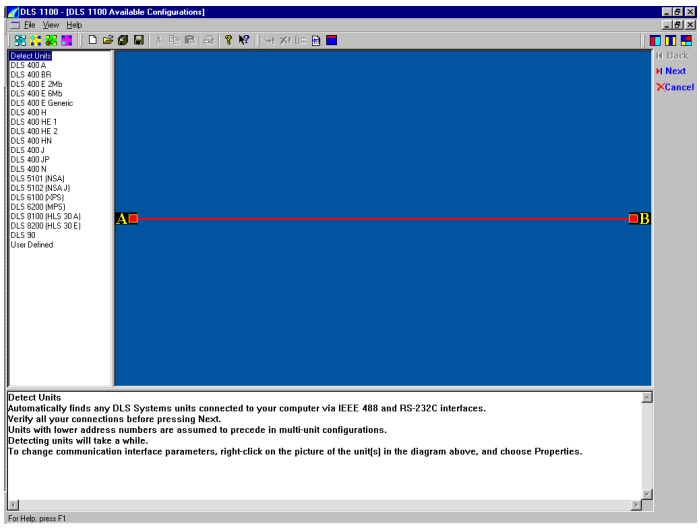


Figure 6 - DLS 1100 Start Up Screen

The DLS 110 software automatically detects any units that you may have and it will display them along the left column. You can also select the “Detect Units” option located in the workspace list to detect your units manually.

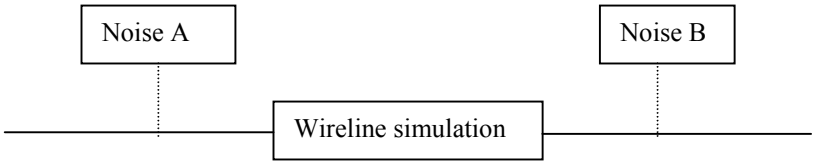
After you’ve selected the unit you want, you can double or right click on the unit’s image and select offline mode.

3. Operation

3.1 DLS 1100 Series Operation Overview

3.1.1 About the DLS 1100 Workspace: Basic System Architecture

DLS 1100 can control any number of wireline simulator units, and up to 2 Impairments generators, which can take the form either of Impairments cards inside the wireline simulator, or external DLS 5101 or DLS 5102 noise generators. Regardless of how many units provide wireline simulation, the basic system architecture will look like this:



3.1.2 Choose a DLS 1100 Series workspace

The Test System is the collection of all the Spirent simulators that you wish to control using the DLS 1100 Series software. The Workspace is the collection of DLS 1100 Series software windows that represent the different parts of your Test System. In order to set up the workspace correctly, you need to tell the DLS 1100 what systems you wish to control.

When you first run DLS 1100, the first thing you will see is the 'Choose a DLS 1100 Workspace' dialog. This screen lets you choose a Workspace from the installed list of standard Spirent simulators, or you can define your own Workspace for controlling multiple simulators by choosing User Defined.
Please note that the DLS 1100 Workspace List will only display the components (downloadable files or NIF files) which are detected on the computer and/or unit.

You can also tell DLS 1100 to search for Spirent simulators by choosing Detect Units. Make your choice from the Workspace List. DLS 1100 shows the diagram of your selected Workspace in the System Display Window. See Figure 7 below.

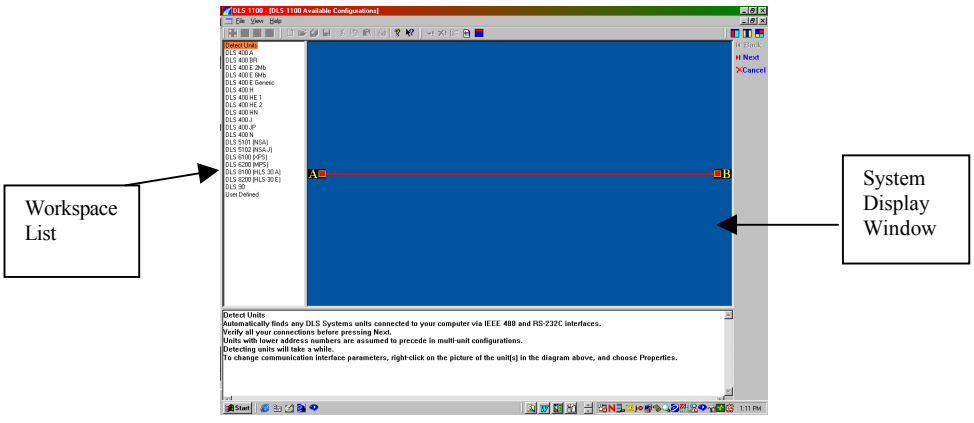


Figure 7 - Choosing a Workspace

You can select the Workspace either by double-clicking on the desired selection, or by single-clicking on the selected unit, then clicking the Next or Finish buttons.

3.1.3 Workspaces and Support Modules

DLS 1100 controls different Spirent simulators via several support DLLs. Your actual display may vary depending on which DLLs are installed in your DLS 1100 package.

3.1.4 Detecting Units

When you choose the Detect Units option from the Workspace List, the DLS 1100 software first checks each address on the IEEE 488 bus and then each active serial port for connected Spirent simulators. The System Display Window will be updated to show any connected simulator units. You then will be asked to click Next to check for installed Impairments cards. Again, the DLS 1100 updates the System Display Window to show impairments cards and prompts you to press Finish to create the DLS 1100 Series Workspace. DLS 1100 creates a window for each of the wireline and impairments components present in the system. Note that if the same simulator unit is connected via multiple interfaces, the defaults for interfaces will be set to the first one detected.

Please note that the DLS 1100 software allows you to use your right click mouse button anywhere on the unit's image. By doing this, the user can easily change parameters of the unit such as connection type and its position in the wireline.

3.1.5 Creating the Workspace

The Workspace includes one window for each component in the Test System. Note that when the workspace is created, regardless of whether you chose to Detect Units or just chose the simulation hardware, DLS 1100 starts in OFFLINE mode. This means that any changes you make are carried out on the screen only. The settings are only transmitted to the unit once you CONNECT.

 Connect button

3.1.6 The Toolbar

The Toolbar appears at the top of the Workspace window, and provides the user with one-click access to many frequently used functions which are also available from the Menu bar.

Figure 8 - DLS 1100 Series Toolbar

Below is a list of the various Toolbar buttons and their functions:

Workspace Functions

 Creates a new workspace. Same as choosing File | New DLS 1100 Workspace from the Menu bar.
 Opens a previously saved workspace. Same as choosing File | Open DLS 1100 Workspace from the Menu bar.
 Saves the current workspace using a new file name. Same as choosing File | Save DLS 1100 Workspace As… from the Menu bar.

 Saves the current workspace using the same file name. Same as choosing File | Save DLS 1100 Workspace from the Menu bar.

File Functions

File functions act on different file types, depending on which window is active during their use. For example, if you press Open file while the focus is on an Impairments window, the actions of the file dialog are carried out on Impairments files.

 Creates a new file. Same as choosing File | New from the Menu bar.

 Opens a previously saved file. Same as choosing File | Open from the Menu bar.

 Saves a file using a new name. Same as choosing File | Save As… from the Menu bar.

 Saves a file using the same name. Same as choosing File | Save from the Menu bar.

Help Functions

 Invokes the DLS 1100 About Dialog.

Simulator Control Functions

 Connects all windows to the corresponding system components. Same as choosing Test | Connect All from the Menu bar.

 Disconnects all active connections. Same as choosing Test | Disconnect All from the Menu bar.

 Sends all current settings to the unit. Same as choosing Test | Send All from the Menu bar.

 Sets all of the DLS 1100 window contents to factory defaults. If there are active connections, corresponding units are updated. Same as choosing Test | Set Defaults from the Menu bar.

Terminal

 Starts the DLS 1100 Terminal. Same as choosing View | Terminal from the Menu bar.
Note. If terminal is open before the system is connected, it will display activity at every active connection without connecting itself. If it is open after the system is online, then it has to be connected to a specific address and can only monitor this unit.

Right-hand Toolbar

The right hand toolbar settings control the formats of the display.

 Show Wireline – Displays the wireline settings selected for the current workspace

 Impairments Window – Shows the currently selected impairments window

 Restore All – Shows both the wireline settings and the selected impairments

3.1.7 Connecting to the Hardware

When the Workspace is first created, there is no connection to the hardware systems. Until a connection is made, any changes you make to settings and values will be done on the screen only. Once you make a connection, then changes are transmitted to the unit immediately. Each pane that represents a distinct hardware unit (as opposed to Internal cards which share interfaces) will have Connection and Address pulldown menus in the upper left corner of the pane.

Figure 9 - Connection and Address Pulldown Menus

Select the desired interface and the correct address. Then click the button on the Toolbar. This button will connect all the windows to the appropriate hardware using the specified interfaces.

3.1.8 Wireline Simulator Control

3.1.8.1 Controls Common to all Simulator Panes:

Unit Bypass: When this is selected, the terminals at side A of the unit are connected directly to the terminals at side B. Note that if you wish to bypass the wireline in a system that contains more than one unit, you need to select Unit Bypass for each unit.

Reverse Loop: When this is selected, the terminals at side A of the unit are connected to side B of the wireline, and the terminals at side B of the unit are connected to side A of the wireline. Note that the Reverse Loop setting is local to the unit on which it is activated. In other words, if the wireline simulation is using more than one unit, you can't reverse the entire loop by using this check box.

3.1.8.2 DLS400A, DLS400H, DLS400N, DLS400HN, DLS400BR Style Panes:

For these systems, you control the wireline by selecting 'Loops', which are preset configurations that are built in to the simulator. These presets are implementations of wirelines as described in various testing standards such as CSA and ANSI. Depending on the type of unit, there may be one of several different styles of panes that appear.

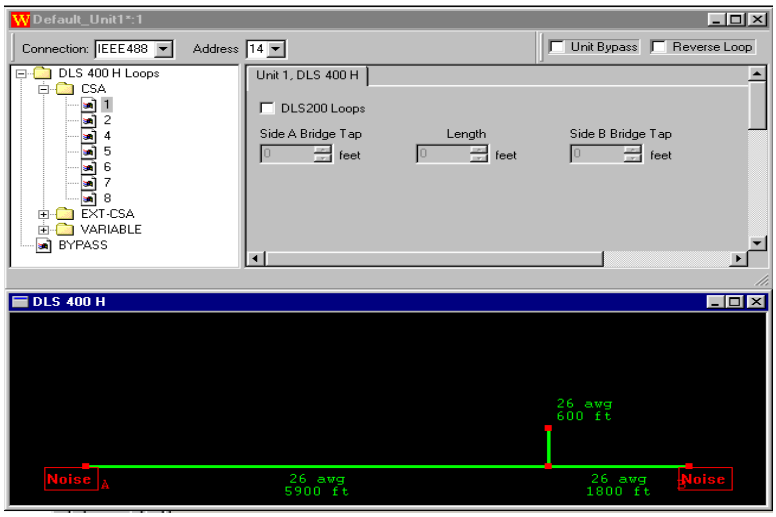


Figure 10 - Loop Selection Screen

Due to the changing nature of Standards requirements, Spirent Communications DLS Division can not guarantee Loop parameters. Although Spirent makes concerted efforts to remain current in its settings, please consult the actual Standards document you are testing against to ensure parameter accuracy.

3.2 DLS 400E, DLS 400J, DLS 400HE

For these systems, you control the wireline by accessing individual wireline cards. Each wireline card resides in a slot in the system. When DLS 1100 is connected to the unit, it will display exactly which wirelines you have within your unit. Also for systems other than DLS 400E Generic, DLS 1100 will check that the unit contains the correct wireline cards to match the factory configuration, and if not, a warning will be shown. The DLS 400E Generic is allowed to contain any wireline cards in any slots.

Figure 11 - Wireline Length Selection Menu

Each slot in the system has a panel associated with it. The panel lets you see what kind of card, if any, is installed in the slot and allows you to control the card. You can adjust the length of the segment of line provided by the card by double-clicking in the Length box, then either editing the value in the box by typing from the keyboard, or by using clicking on the Up and Down controls which appear once you double click.

You can also set the card as a bridge tap by checking the Tap box.

3.3.2 Groups

The Group is a feature of the DLS 1100 designed to simplify multiple card settings. The purpose of the Group is to let you apply the same length setting to all the cards within the group. You put cards in a Group by clicking the check box in the appropriate panel. You can also use the Select, Deselect, and Invert Selection buttons in combination with the All and Gauge option buttons to choose groups of cards. Once you have grouped the cards that you want to set, enter a length in the text box, and click Apply.

In the same group of controls you will notice a check box titled ‘Distribute’. This check box is used in conjunction with selection by Gauge. It causes the DLS 1100 to determine the slot length settings necessary to create the total length that you apply. For example, suppose your unit contains six 0.5mm ADSL cards, each with a maximum length of 500 m, and you select all the 0.5 mm ADSL cards. If you then enter 3000, check the Distribute box, and press apply, DLS 1100 automatically sets all the 0.5 mm ADSL cards to 500 m.

Note that the DLS 1100 uses up the maximum length from each slot in succession, so a particular slot will remain at 0 until the previous slot reaches its maximum. If the desired length exceeds the available length, a warning will be shown.

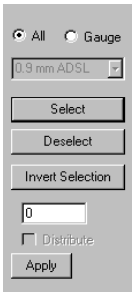


Figure 12 - Gage Selection Menu

3.3.3 Side-specific Impairments Control

The impairment controls menu allows the user to select and specify the available impairments for the selected workspace.

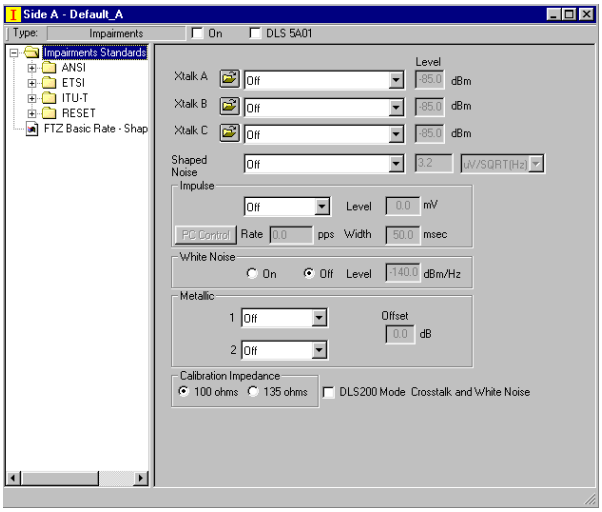


Figure 13 - Impairments Control Menu

3.2.1.1 Crosstalk

Control the crosstalk generators by either pulling down the combination box and selecting a crosstalk type, or by clicking the folder button to the left of the combination box, and selecting a disk-based crosstalk. You then need to enter the desired levels in the text boxes.

Figure 14 - Crosstalk Selection Menu

3.2.1.2 Shaped Noise

Control the shaped noise generator by either pulling down the combination box and selecting a shaped noise type, or by clicking the folder button to the left of the combination box, and selecting a disk-based shaped noise. You then need to enter the desired level in the text box. Depending on what type of shaped noise you choose, you may also be able to choose the measurement units.

Figure 15 - Shaped Noise Selection Menu

3.2.1.3 Impulse

Select the impulse type from the combo box. You will need to enter the desired level and rate, and depending on the type of impulse, you may be able to change the impulse width.

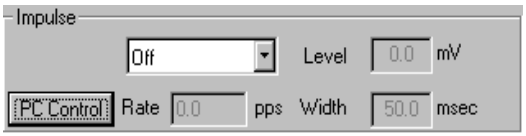


Figure 16 - Impulse Selection Menu

3.2.1.4 White Noise

Turn on and off the White Noise by clicking the desired option button. If the noise is switched on you are able to enter the desired level.

Figure 17 - White Noise Menu

3.2.1.5 Metallic Noise

Choose the desired harmonics from the 2 combo boxes. When you select a particular harmonic, the DLS 1100 displays the actual frequency being output, which depends on the setting of the Powerline Frequency, which is found on the Common Impairments screen. You can then enter an offset level, which adjusts the output level relative to the ANSI T1.601 standard reference levels.

Figure 18 - Metallic Noise Menu

3.3 T1.601 Reference Levels for Metallic Noise

Frequency (Hz)	Tone Power (dBm into 135 ohms)
50 / 60	-47
150 / 180	-49
250 / 300	-59
350 / 420	-65
450 / 540	-70
550 / 660	-74

Calibration Impedance

This selection, controlled by selecting one of the 2 option buttons, does not affect the actual level coming from the unit, but causes the DLS 1100 to display levels as would be measured using the selected impedance.

Common Impairments Control

The term 'Common Impairments' refers to impairment settings that affect both sides, and Longitudinal Voltage, which is injected into the middle of the wireline, as opposed to at one specific side.

Longitudinal Voltage

Longitudinal voltage is injected via a transformer, which is connected in series with the wireline. For this reason longitudinal voltage cannot be applied into a bypassed loop – the transformer would be short-circuited. The DLS 1100 will not let you apply longitudinal voltage to a bypassed unit. It will automatically turn off and disable longitudinal voltage depending on the bypass setting.

The side of the wireline that receives the applied longitudinal voltage is determined by the "applied at" option buttons. You can choose Side A, Side B, or Both. Note that if Both is selected, the range of the voltage is halved.

Powerline Frequency

Choose either 50 Hz or 60 Hz to select your local or desired powerline frequency. This setting affects the frequencies of the Longitudinal Voltage and the Metallic noise, which is controlled on the individual side-specific noise panes.

4. Using the DLS 1100 Series Software

4.1 Program Start-up

There are 3 options for start-up:

a. **No action:** Only the Main Application Window is displayed.
b. **Last Configuration:** When the program starts, the DLS 1100 looks for a file on the disk which defines the hardware configuration. If this file exists, the program then verifies that all the units declared in the configuration file are of the correct type, are present, and are working properly.
c. **New configuration:** The program goes directly to a System Manager-type dialog which will let the operator define the complete test system. This has the format of a list of supported devices, with a port selection and an add button. Thus the user could add a DLS 400E unit at IEEE-488 address 14, a DLS 400E unit 1 at address 15, a DLS 400E unit 2 at address 16, and an NSA 400 at serial port COM2. The selection can be done either by the user or automatically. The results are shown on the dynamically updated graphic. If the user is not satisfied with the system, then the options allowing to customize the settings are available.

After this takes place the DLS 1100 will display tiled views of its elements. Standard set-up would be 2 Impairments views – side A and side B, a Wireline view containing a tab to display multiple units and system diagrams. Configurations that lack some of the elements will not display them. Thus the HLS 30 will not have Impairments views at all, and NSA 400 will not have the Wirelines view. Each view's title bar has the name of the files being used displayed. The graph window displays the system configuration file name. If no file name is selected, then the word **Default** is shown.

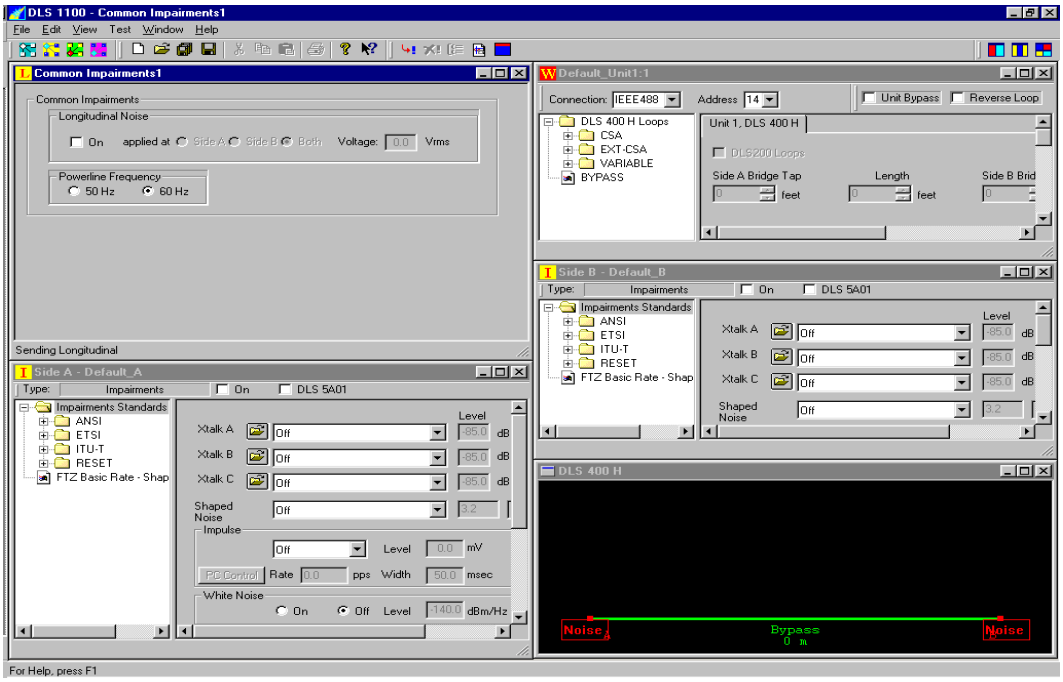


Figure 19 - DLS 1100 Tiled Display

4.2 Operation

- Connection (for each wireline and external impairments unit)

1. Open specified connection.
2. Query unit to determine its type.
3. Query unit for the presence of internal impairment cards.
4. Send the presently loaded parameters to the respective units.

- Performance Testing

1. Once connected the DLS 1100 permits all enabled controls to react to the user's interaction and send data to the Spirent units. If the entered values are out of range the values will be converted by the DLS 1100 to fit within the specified range.
2. The contents of files downloaded while connected are sent to the units.
3. DLS 1100 allows the user to open, save, save as and create new configurations and individual files.

4.3 Terminal

- The program should allow the user to type commands using a window similar to Hyperterminal (RS-232) or Telnet (Ethernet).
- The RS-232 terminal should display status of CTS, DSR, DCD and RI. The user should be able to control the state of DTR and RTS leads.

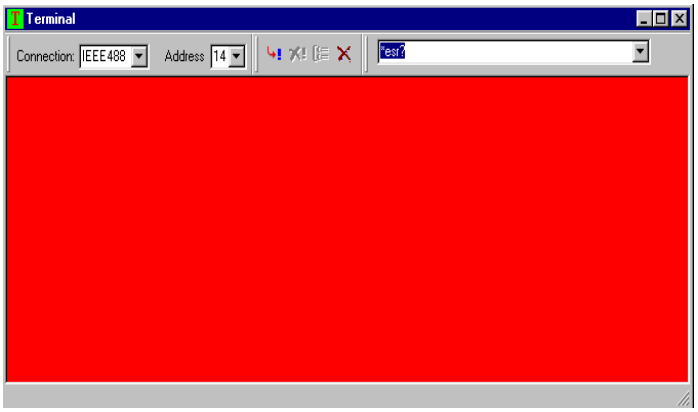


Figure 20 - Terminal Window

4.4 Diagnostics

- Impairments views should be disabled in case the card is not there.
- Status bar should show which unit is being connected to.
- Ability to poll units for proper connection, status, current settings, etc.

4.5 Error Handling

- Presence (and dropping of) the communication link.
- Disk management (existence of files, available disk space) – optional.
- Communication error.
- Memory corruption, access violations, OS errors.

4.6 Debugging Tools

- Trace statements when errors are occurring.

4.7 Interfaces

The application will communicate using an RS-232 interface or an IEEE 488 Bus through a National Instruments Driver. If a connection cannot be established the standard Windows dial-up menu will be invoked. The interface to the modem under test will initially occur through an RS-232 or IEEE 488 interface.

4.8 CPU and OS Requirements

The DLS 1100 Series software will run on any PC running Windows 95™. The system must have an IEEE 488 Bus and a National Instruments driver installed, and/or a Serial port.

4.9 Firmware Requirements

Your DLS wireline simulator must have Firmware Version 8A4296 and above in order for it to be compatible with the DLS 1100 software. If the necessary firmware is not detected when the software queries the unit, then the DLS 1100 will inform the user of an error. In the event of an error, please contact DLS Division Customer Service for possible upgrade paths. (Customer Service contact information can be found in the Warranty section of this manual.

4.10 On-line Help

The F1 key provides you with the information you need to contact Customer Service for help with the DLS 1100 software.

5. CUSTOMER SERVICE

5.1 Customer Service Contact Information

For all North American customers, please direct any questions or concerns regarding the operation of a purchased unit, to the Spirent AE Customer Service team by one of the following methods:

Direct Line: 613-592-7301

Toll free at: 800-465-1796

Fax at: 613-592-0522

E-mail at: ae.service@spirentcom.com.

All other customers should check the **ae.spirentcom.com** web site for the contact information of the nearest Customer Service center or contact the main Spirent AE service center for assistance (contact information is listed above).

For product information and updates, please visit the Spirent Communications web site at **ae.spirentcom.com**.

For product manuals, software updates and more information, please visit the customer extranet at:

https://ae.spirentcom.com/secure/

Passwords for the extranet can be requested at:

https://ae.spirentcom.com/Customer_care/needlogin.htm.

6. Warranty

Spirent AE warrants all equipment bearing its nameplate to be free from defects in workmanship and materials, during normal use and service, for a period of twelve (12) months from the date of shipment.

In the event that a defect in any such equipment arises within the warranty period, it shall be the responsibility of the customer to return the equipment by prepaid transportation to a Spirent AE service centre prior to the expiration of the warranty period for the purpose of allowing Spirent AE to inspect and repair the equipment.

If inspection by Spirent AE discloses a defect in workmanship or material it shall, at its option, repair or replace the equipment without cost to the customer and return it to the customer by the least expensive mode of transportation, the cost of which shall be prepaid by Spirent AE.

In no event shall this warranty apply to equipment which has been modified without the written authorization of Spirent AE, or which has been subjected to abuse, neglect, accident or improper application. If inspection by Spirent AE discloses that the repairs required are not covered under this warranty, the regular repair charges shall apply to any repairs made to the equipment.

For international customers, please contact your local Spirent AE sales representative or check the **ae.spirentcom.com** web site for the contact information of the nearest service center.

In North America, if warranty service becomes necessary, the customer must contact Spirent AE to obtain a return authorization number and shipping instructions:

Spirent Communications
750 Palladium Drive
Ottawa, Ontario, Canada
K2V 1C7
Customer Service Direct Line: 613-592-7301
Fax: 613-592-0522
Toll Free: 1-800-465-1796
ae.service@spirentcom.com

This warranty constitutes the only warranty applicable to the equipment sold by Spirent AE, and no other warranty or condition, statutory or otherwise, expressed or implied, shall be imposed upon Spirent AE nor shall any representation made by any person, including a representation by a representative or agent of Spirent AE, be effective to extend the warranty coverage provided herein.

In no event (including, but not limited to the negligence of Spirent AE, its agents or employees) shall Spirent AE be liable for special consequential damages or damages arising from the loss of use of the equipment, and on the expiration of the warranty period all liability of Spirent AE whatsoever in connection with the equipment shall terminate.

7. Shipping

The DLS 1100 software will be shipped in a padded envelope with your Spirent Communications DLS Division wireline simulator.

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