FLUKE®
Biomedical

Ansur Index 2XL

Plug-In

Users Manual

April 2010, Rev. 1

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Introduction

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About This Manual

This Users Manual explains how to use the Ansur Index 2XL Plug-In with Ansur software. The manual covers all features specific to the Plug-In. Familiarity with both Ansur software and Microsoft Windows and their features will help in the design and use of automated tests for the Fluke Biomedical Model Index 2XL SpO2 Simulator, hereafter called the "Simulator." The Simulator tests fingertip pulse-oximeters by simulating a human finger ("Index" refers to index finger) with a selected SPO_2 (saturated peripheral oxygen) level and pulse rate.

This manual is divided into the following chapters:

Chapter 1 “Introduction” provides general information on Ansur software, the Index 2XL Plug-In and how to use this manual.

Chapter 2 “Getting Started” provides information on how to install and configure the Index 2XL Plug-In, and how to create a custom R-Curve for a non-supported oximeter.

Chapter 3 “Index 2XL Tests” provides step-by-step descriptions on how to use the Index 2XL Plug-In to design basic automated tests for use with the Simulator.

Chapter 4 “Index 2XL Templates” contains information on creating highly efficient automated test procedures using the Index 2XL Plug-In template functionality.

Ansur Software

Ansur Test Automation software is the umbrella name of the Ansur Test Executive core software plus Analyzer or Simulator-specific Plug-Ins for various Fluke Biomedical test instruments, such as the Index 2XL SpO2 Simulator. Ansur manages test procedures by allowing both manual and visual automated test sequences.

The software works hand-in-hand with Fluke Biomedical analyzers and simulators, creating a seamless integration for:

- Visual inspections
- Preventive maintenance
- Work procedures
- Performance tests
- Electrical safety tests

Ansur Plug-Ins

Ansur Test Executive software utilizes Plug-In modules that work with a wide array of Fluke Biomedical instruments. The Plug-In module is a software interface that provides test elements for a specific analyzer or a simulator to the Ansur Test Executive program. This scheme allows the use of a similar user interface for all analyzers and simulators supported by Ansur.

With the purchase of a new Fluke Biomedical analyzer or simulator, it is possible to update existing Ansur software by installing a new Plug-In. Each Plug-In module allows users to work with only the options and capabilities needed for the instrument under test.

Index 2XL Plug-In

The Ansur Index 2XL Plug-In provides remote access to the Index 2XL SpO2 Simulator, referred to throughout this document as the “Simulator.” In addition to the general test plug-ins, specialized plug-ins address all test requirements for specific instruments.

Note

The Index 2XL SpO2 Simulator Users Manual explains the Simulator's capabilities and use.

Create and use Ansur test procedures with Ansur Index 2XL test elements to incorporate the capabilities of a Simulator into automated testing. Users can customize tests to analyze specific performance requirements. There are unique test elements for each of the tests. Simulations typically run on the Simulator.

Additional References

In addition to this manual, answers to questions about using the Simulator or PC may be found in the following sources:

- *Fluke Biomedical Index 2XL SpO2 Simulator Users Manual*
- *Fluke Biomedical Ansur Test Executive Users Manual*
- *Microsoft Windows Help and Support Center*

Software Updates

Updates for Ansur software are published for download on the Fluke Biomedical website, *http://www.flukebiomedical.com*

Terms and Abbreviations

Table 1-1 lists terms and abbreviations used in this manual.

Table 1-1. Terms and Abbreviations

Term	Description
Ansur	Ansur is a software suite using plug-ins to perform or automate test and inspection procedures in conjunction with several Fluke Biomedical test instruments.
DUT	Device Under Test—the equipment subjected to a test using the Simulator.
DUT Info	Information used to identify one particular DUT. DUT info usually consists of a serial number, manufacturer, device type and model. Ansur also adds a few extra data fields such as location and status.
Index 2XL	SpO2 Simulator from Fluke Biomedical -- "Index" refers to index finger, and "SpO2" refers to saturation of peripheral oxygen. This device tests fingertip pulse oximeters.
Field User	The person using Ansur to perform a test template on a DUT.
Module Setup	Module setup contains information about probes connected to the Simulator to test one specific DUT.
Plug-In	Add-on software program that extends Ansur so that it can interface with a specific Fluke Biomedical test instrument to configure it for a specific test and to automatically run tests and record the results (if applicable)
Test Container	A test container is a test element that can contain other test elements. The Index 2XL Auto Sequence is a test container.
Test Element	An Ansur construct that encapsulates test configuration and results. A test template is built of several test elements.
Test Guide	A window displayed by Ansur or any of its plug-ins when a test element is being performed.
Test Record	An Ansur file containing the results of a performed test template The test record can be printed as a test report.
Test Template	An Ansur file containing a set of test elements that define how a particular DUT is to be tested. A test template can also contain instructions on how to perform service, preventive maintenance, repair, and other tasks on a DUT.

Chapter 2
Getting Started

Introduction

This chapter describes installation of the Index 2XL Plug-In and its use together with Ansur software and the Index 2XL SpO2 Simulator instrument from Fluke Biomedical.

Note

A Simulator is not necessary to create test templates and experiment with the functionality available in Ansur and the Index 2XL Plug-In. However, actual tests cannot be performed unless the Simulator is connected to the computer.

System Requirements

The following are recommended minimum requirements for installation:

- IBM PC/XT-compatible Pentium II 350 MHz or faster processor
- 128 MB of RAM
- Microsoft® Windows® 2000 or Windows® XP or Windows® Vista or Windows® 7 operating system
- Fluke Biomedical Ansur V2.9.0 or newer
- 50 MB of available hard drive for software
- Hard drive space (from 100 kB to several MB) for result and template files

Installing the Index 2XL Plug-In

The Index 2XL Plug-In must be installed on the computer that has Ansur software already installed on it before the features described in this user manual can be used. For information on obtaining the Ansur software and the Index 2XL Plug-In, contact your local Fluke Biomedical representative or visit the Fluke Biomedical website at http://www.flukebiomedical.com.

Note

Ansur version 2.9.0 or newer must be installed before the Index 2XL Plug-In is installed and used.

Download the Index 2XL Plug-In from the Fluke Biomedical website and follow the steps below:

Note

When downloading the Index 2XL Plug-In from the Fluke Biomedical website, it is possible to run the installation without first downloading. But these instructions assume downloading the installation package and then running it from the local PC.

Note

When installing Ansur or any of its components/plug-ins on computers running Microsoft Vista, it is important to perform the installation as the Administrator for that computer. Otherwise the registry will not be properly updated and Ansur will not work properly. For installing on Windows Vista, you must first download the file to your local computer, then locate the installation file, right click and select "Run as Administrator."

1. Open **Windows Explorer** and browse to the saved Index 2XL Plug-In installation program file, usually named **Ansur Index 2XL Plug-In Vn.n.n.exe**, where *n.n.n* is the Plug-In version number.
2. Double-click the installation program. The installation extracts the Plug-In elements and displays the **Welcome** dialog box.

3. Click **Next** to display the license agreement.
4. Select the checkbox for "**I accept the terms in the license agreement**," and click **Next** to display the default destination folder.
5. Choose one of the following options:
   - Click **Next** to accept the default destination folder in which Ansur was installed.
   - Click **Change** if Ansur has been installed in a different folder. In this case, the destination folder for the Plug-In is changed so that it resides in the same directory as the Ansur program.

Note

If Ansur has been installed in a different destination folder from the default, be sure to use the same folder for the Index 2XL Plug-In.

6. Click **Install** to begin the installation. A progress bar indicates the status of the Plug-In installation.

   After a few minutes, the installation concludes, and the window displays the dialog box and the Finish button.
7. Click **Finish**. The Plug-In will load when Ansur is started.

Entering the License Key

When using the Plug-In for the first time, the user is prompted to enter a software license key provided by Fluke Biomedical at the time of purchase.

Note

Test templates can be created without a license key by using the demonstration (Demo) mode. Demonstration mode allows many of the tasks described in this user manual. However, a user may not save or print without licensing the Plug-In.

1. Start Ansur by doing one of the following:
   - Double-click the **Ansur** icon on the desktop.
   - From the **Start** menu, select **Start | Programs | Fluke | Ansur**.

Note

The license key dialog box shown in Figure 2-1 appears at startup if a license key has not yet been entered for the Plug-In.

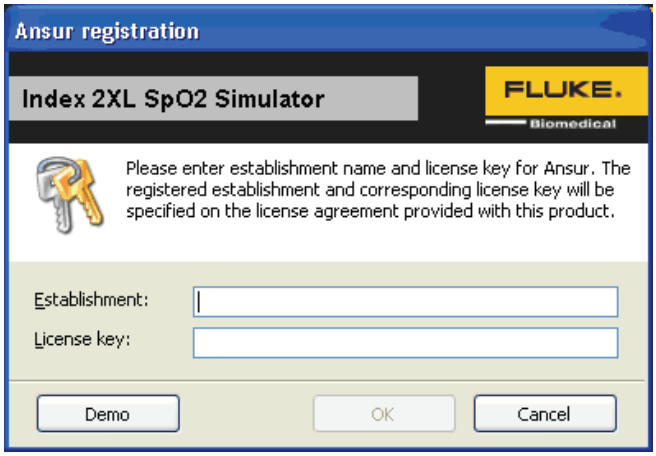

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Figure 2-1. Entering the Registration License Key

2. Enter the **Establishment** name and the plug-in License key. If the **License key** is not available, click the **Demo** button to start Ansur in Demo mode.

   Note

   Because the license key is derived from the establishment name, both strings must match the license information provided by Fluke Biomedical. This information is case sensitive and space sensitive. If the establishment name has been entered in the past, this field is already filled in.

3. Click **OK** to start Ansur.
4. Click **Cancel** to prevent the Plug-In from being loaded.

Uninstalling the Plug-In

To uninstall the Index 2XL Plug-In:

1. Select **Start | Control Panel** and double-click **Add or Remove Programs**.
2. Locate and select the entry named **Ansur Index 2XL Plug-in**, as shown in Figure 2-2.

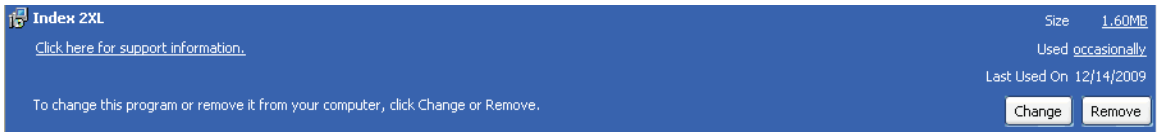

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Figure 2-2. Removing Index 2XL Plug-In

3. Click on the **Remove** button.
4. When asked to verify the removal, click **Yes**. A dialog box with a progress bar displays while the Index 2XL Plug-In is being removed from the computer.

   When the Plug-In is no longer listed in the **Add or Remove Programs** window, it has been completely removed.

Ansur Main Window

At startup, Ansur displays the Main Application window shown in Figure 2-3. Test templates can be created and edited from this window.

Test Explorer

The left pane of the **Main Application** window is called the **Test Explorer**. It displays the installed Plug-Ins available in Ansur.

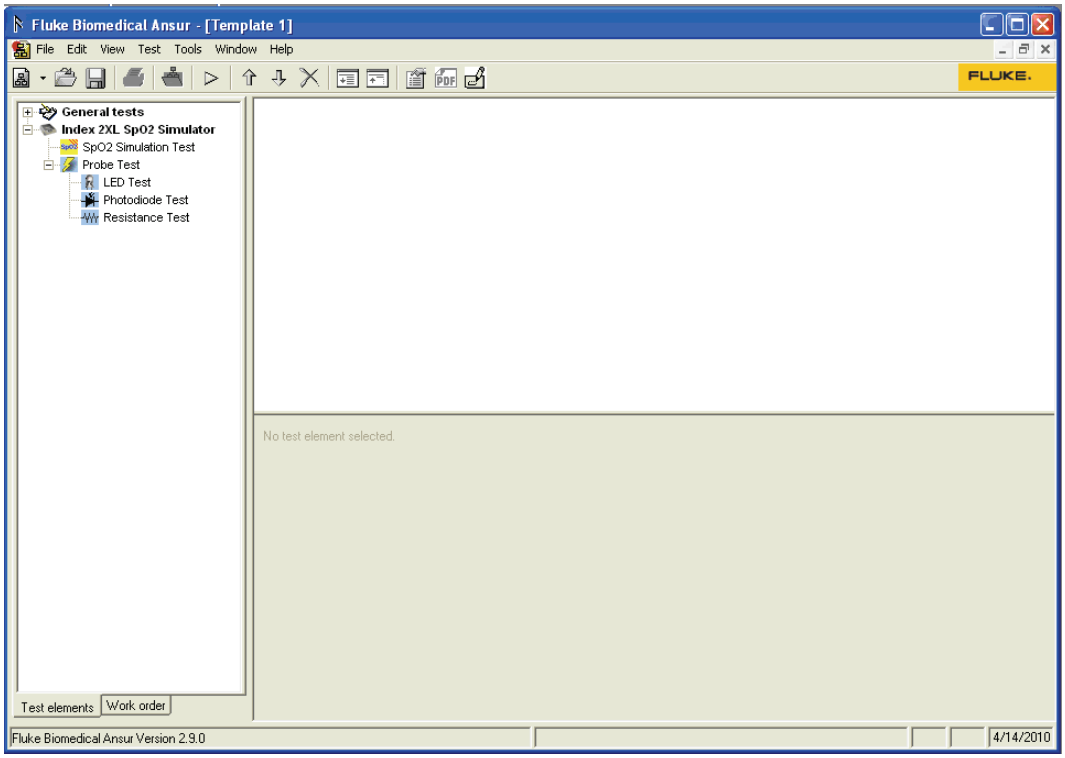

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Figure 2-3. Index 2XL Main Application Window

Look in the **Test Explorer** to verify that the Plug-In has loaded properly. If **Index 2XL SpO2 Simulator** is listed, the Plug-In correctly loaded during startup.

Viewing Available Test Elements

To expand the list and view the available Plug-In test elements in the **Test Explorer** window, either click the **+** (plus) symbol to the left of the Plug-In name or double-click the name itself; in this case **Index 2XL SpO2 Simulator**. Expanding the Plug-In displays the list of test elements, as shown in Figure 2-4.

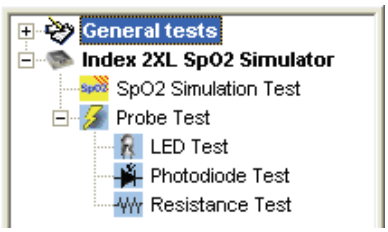

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Figure 2-4. Index 2XL Test Explorer Window

Selecting Plug-In Preferences

Note

If the Index 2XL SpO2 Simulator is not connected to COM1 on the PC, Ansur displays an Instrument Not Found window where the port the Simulator is connected to can be entered. The correct port number is displayed in the Windows Device Manager. Look for the USB Serial Port entry under "Ports."

Once the PC locates which port the Simulator is connected to, Ansur remembers the port number and uses it as the default port for electrical safety tests.

Use Plug-In Preferences to choose default settings that best suit how you plan to use the Plug-In with the Simulator. Defaults define the start-up condition of most pulse oximeter performance testing features.

To change Plug-In Preferences:

1. Start the Ansur Test Executive program.
2. Click **Tools | Options** to display the **Preferences** window shown in Figure 2-5.

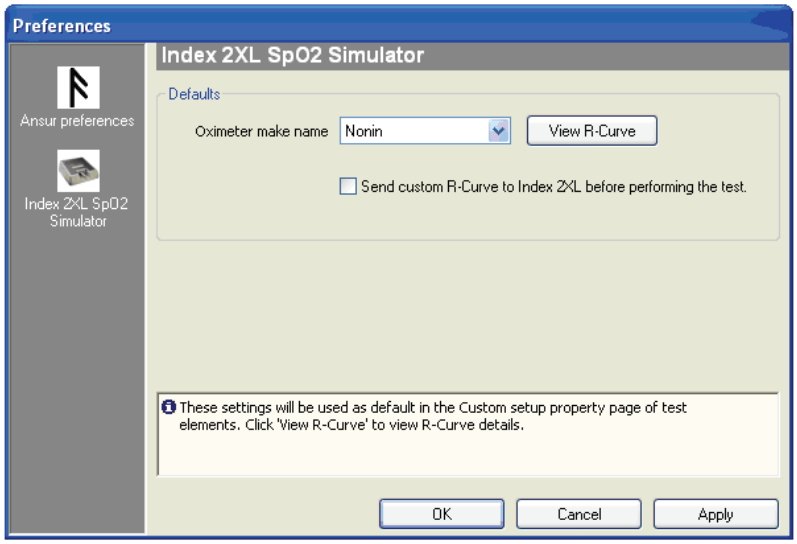

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Figure 2-5. Index 2XL SpO2 Simulator Preferences

3. Click the **Index 2XL SpO2 Simulator** icon. The window displays the **Default** settings. In this window you can select oximeter make, view create custom R-curves, and if using custom R-curves, send the custom R-Curves to the Simulator before performing the test.
4. Click **OK**.

Oximeter Make Name

There are 10 standard oximeter makes available in the Simulator **Preferences** window. They are:

- BCI
- Criticare
- Datascope
- Datex
- PMS M1190
- Masimo
- Nellcor
- Nihon-Kohden
- Ohmeda & Nova
- Respironics

The six predefined oximeter makes for which you can view the R-Curve details are: Invivo, M1190, M1191, N-10, Nonin, and PALCO. Instructions later in this chapter explain how to create your own R-Curves and save them in the Simulator. Any optional custom R-Curves you create and name, appear in the Oximeter make name dropdown list.

Viewing a Custom R-Curve

If a custom R-Curve has been established, you can select the custom oximeter's R-Curve from the **Oximeter make name** dropdown list and view the details. You cannot view R-Curves of the standard oximeter make names supplied with the Plug-In. If there are any custom R- Curves, click the **View R-Curve** button to view the custom R-Curve details as displayed in Figure 2-6. You cannot edit the Oximeter Details and the R-Curve values in this window. Editing these values is explained later in this manual.

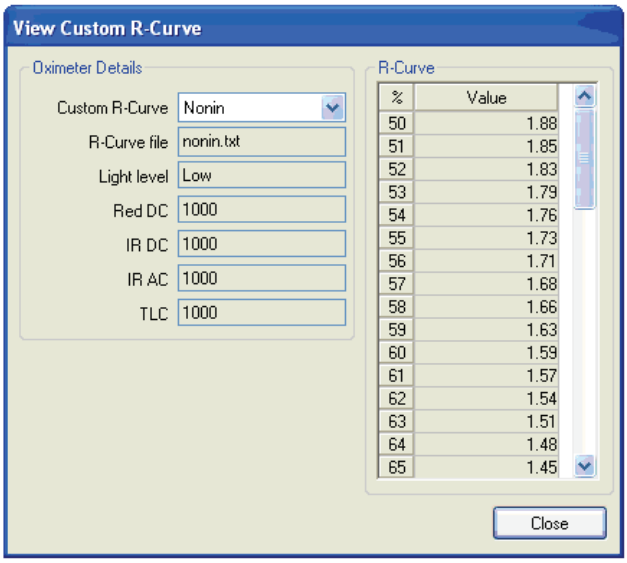

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Figure 2-6. View Custom R-Curve window

Synchronizing custom R-Curves in the Plug-In with the Simulator

If the error message in Figure 2-7 appears while the PC is connected to the Simulator, it means that the Plug-In has a custom R-Curve programmed that has not been downloaded to the Simulator yet. To remedy the situation, make sure there is connectivity between the PC and the Simulator and click **Yes** to send the selected custom R-Curve to the Simulator and continue to prepare to do a test or Click **No** to exit.

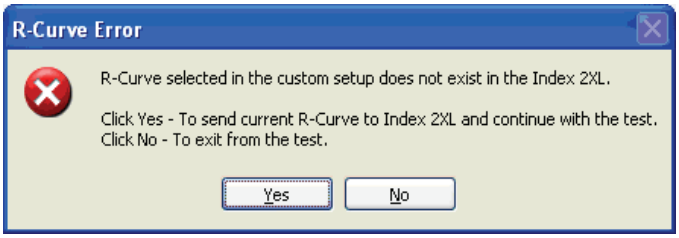

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Figure 2-7. Missing Custom R-Curve in the Simulator

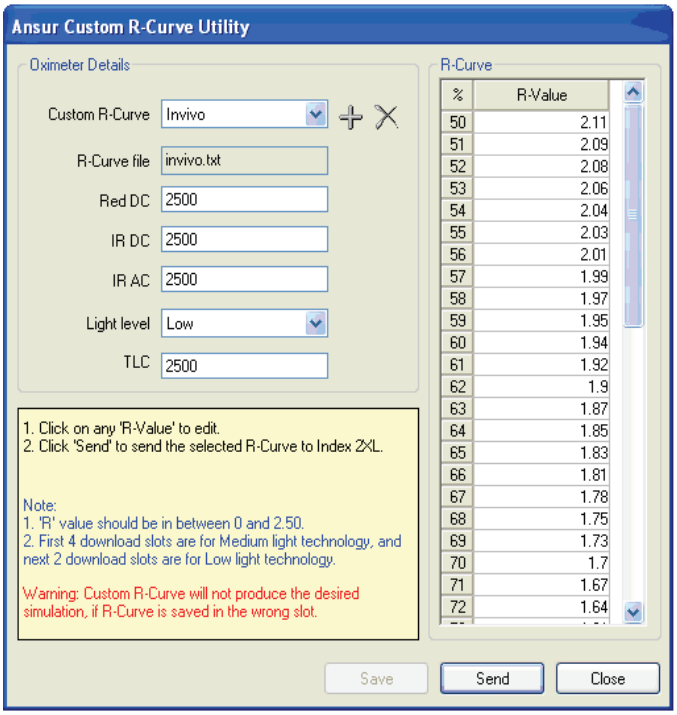
Defining a New (Custom) Oximeter

To create your own oximeter R- Curves and send the custom R-Curves to the Simulator, proceed as follows:

1. Start the Ansur Test Executive program. Click **Tools | Custom R-Curve** to

display the **Ansur Custom R-Curve Utility** window shown in Figure 2-8.

2. Alternatively, select **Start | Fluke | Custom R-Curve** to display the **Ansur Custom R-Curve Utility** window.



git007.bmp

Figure 2-8. Custom R-Curve window

3. Click  to create a new oximeter. The "**Custom R-Curve Generator**" window appears as shown in Figure 2-9.

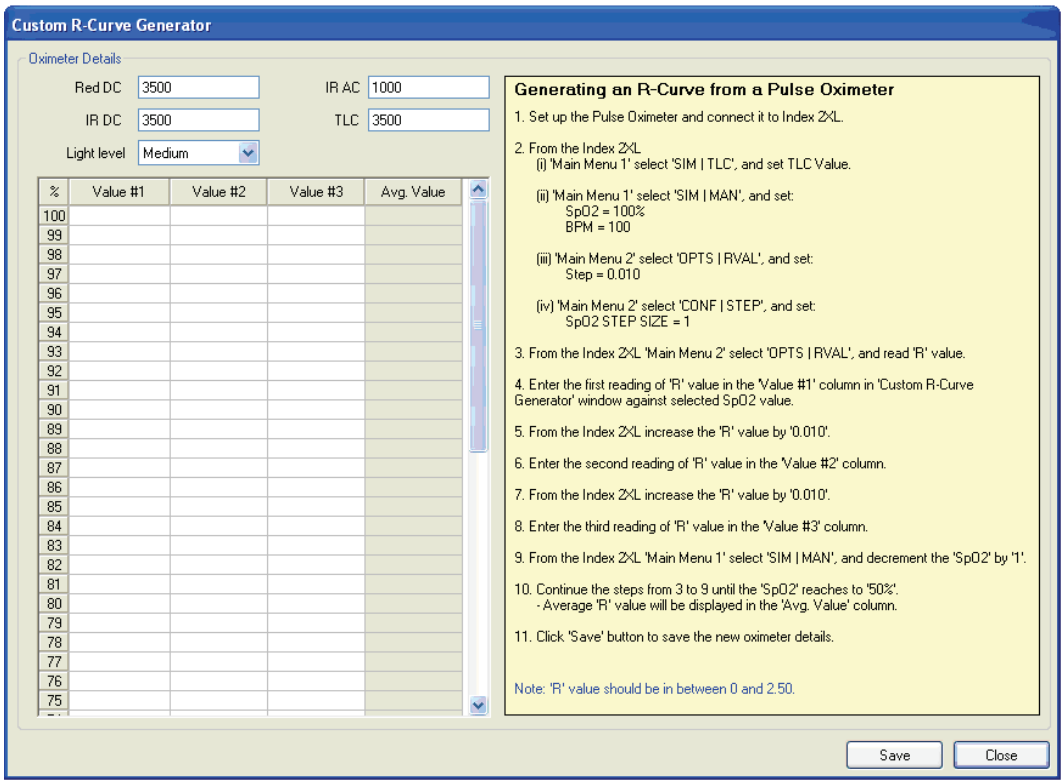


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Figure 2-9. Custom R-Curve Generator window

4. Enter the Oximeter Details as shown in the example in Table 2-1.

Table 2-1. Example Custom Oximeter Details

Option	Description
Red DC	Red Transmissivity. (The value should be between 0 and 4095)
IR DC	Infrared Transmissivity. (The value should be between 0 and 4095)
IR AC	Infrared light AC amplitude peak-to-peak attenuation for the pulse oximeter under test. (The value should be between 0 and 4095)
TLC	Transmission Control Level for the pulse oximeter under test. (The value should be between 0 and 4095)
Light level	Light level, **Medium** or **Low**. The light level is organized into six download slots as Download Slot 1 = Medium Light Download Slot 2 = Medium Light Download Slot 3 = Medium Light Download Slot 4 = Medium Light Download Slot 5 = Low Light Download Slot 6 = Low Light *Note* *Custom R-Curve will not produce the desired results if R-Curve is saved in the wrong slot.*

5. Connect the pulse oximeter to the Simulator.
6. Set **RVAL** step to **0.010** in the Simulator manually.
7. Set **SpO2** to **100%** in the Simulator manually.
8. Set **BPM** (pulse rate) to **100** BPM in the Simulator manually.
9. Enter the first reading, displayed in the Simulator in the "**Value #1**" column against "**100%**" row.
10. Increase the **RVAL** by 0.010
11. Enter the second reading in the "**Value #2**" column against "**100%**" row.
12. Increase the **RVAL** by 0.010
13. Enter the third reading in the "**Value #3**" column against "**100%**" row.
14. The Average R-value is calculated and displayed in the "**Avg. Value**" column.
15. Now, decrement the SpO2 by 1. Repeat the steps from step 8 to step 13 entering the Value #1, Value #2, and Value #3 against the set SpO2 value until the SpO2 reaches 50%.
16. After completing the steps, click **Save** button to save the file. **Save Oximeter As…** window appears as shown in Figure 2-10.

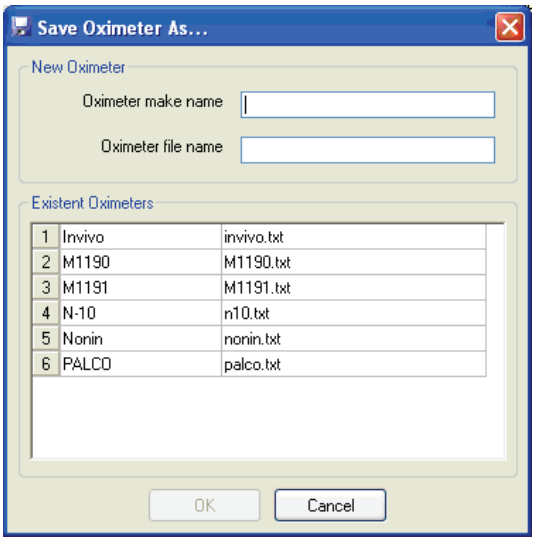

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Figure 2-10. Save Oximeter As… window

17. Enter the **Oximeter make name** and **Oximeter file name**. (Maximum character length is 9 for Oximeter make name and 16 for Oximeter file name)
18. Click **OK** to save the new custom oximeter R-Curve and close the window.
19. Click **Cancel** close the window.
20. Click **Send** in Custom R curve window to send the new custom R-Curve to Index 2XL simulator.

Note

The Simulator must be connected to the computer with a serial communication cable before sending the R-Curve.

Editing a Previously Programmed Custom R-Curve

To edit a custom R-Curve:

1. Start the Ansur Test Executive program. Click **Tools | Custom R-Curve** to display the **Custom R-Curve** window shown in Figure 2-8.

   Alternatively, select **Start | Fluke | Custom R-Curve** to display the **Ansur Custom R-Curve** window.

2. Choose the required R-Curve from the **Custom R-curve** dropdown list.
3. Edit the Oximeter details and R-Value if necessary.
4. Click **Save**. An Overwrite confirmation dialog box appears as shown in Figure 2-11.

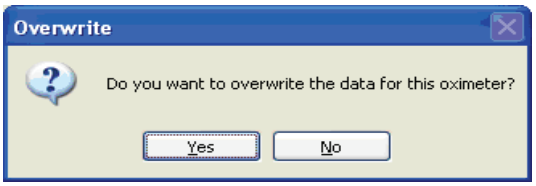

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Figure 2-11. Overwrite Dialog Box

5. Click **Yes** to overwrite the data for the oximeter. A Save dialog box appears. Click OK.
6. Click **No** to save the changes as a new oximeter R-Curve. Save Oximeter As… window appears. Enter the new Oximeter make name and Oximeter file name. Click **OK**.

Deleting a Custom R-Curve

To delete a custom R-Curve, proceed as follows:

1. Start the Ansur Test Executive program. Click **Tools | Custom R-Curve** to display the Custom R-Curve window shown in Figure 2-8.

   Alternatively, select **Start | Fluke | Custom R-Curve** to display the **Ansur Custom R-Curve** window.

2. Choose the required oximeter R-Curve from the **Custom R-Curve** dropdown list.
3. Click  to delete the selected oximeter R-Curve. A conformation dialog box appears as shown in Figure 2-12.

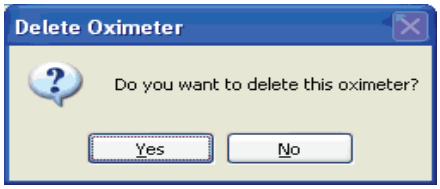

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Figure 2-12. Delete Oximeter Dialog Box

4. Click **Yes**, to delete the selected oximeter R-Curve. Click **No** if you do not want to delete the oximeter R-Curve.

Loading a Custom R-Curve into the Simulator

To load a custom R-Curve into Index 2XL SpO2 Simulator:

1. Start the Ansur Test Executive program. Click **Tools | Custom R-Curve** to display the **Custom R-Curve** window shown in Figure 2-8.
2. Alternatively, select **Start | Fluke | Custom R-Curve** to display the Ansur

Custom R-Curve window.

3. Choose the required R-Curve from the **Custom R-Curve** dropdown list.
4. Click **Send** to send the selected R-Curve to the Simulator.

Note

If you try to send the R-Curve to the Simulator without first saving it in the Plug-In, the "Save" dialog box appears as shown in Figure 2-13. If this happens, Click **Yes** *to first save the customer R-Curve information in the Plug-In.*

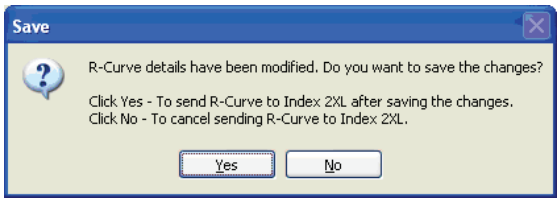

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Figure 2-13. R-Curve Save Error Dialog Box

5. When sending the R-Curve to the Simulator, a **Location** dialog box appears as shown in Figure 2-14 for you to select the location in the Simulator for the R-Curve.

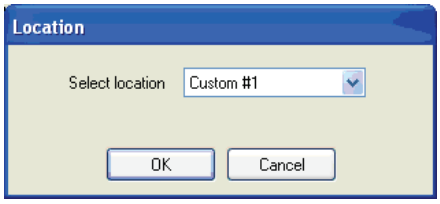

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Figure 2-14. R-Curve Saving Location Dialog Box

6. Six locations are available to choose from in the **Select location** dropdown list, depending on the Light level selected in **Custom R-Curve Generator** window.
   - If the **Light level** is **Medium**, locations are Custom #1, Custom #2, Custom #3, and Custom #4.
   - If the **Light level** is **Low**, locations are Custom #5, and Custom #6.
7. Choose the location and click **OK**.
8. A dialog box announces successful downloading to the Simulator if communication has been established. Click **OK** again to complete the download process.

Chapter 3
Index 2XL Tests

Introduction

This chapter describes how to use the Ansur Index 2XL Plug-In program to automate testing of pulse oximeters with the Index 2XL SpO2 Simulator. Disconnect the Index 2XL from the computer first if you decide to operate the Simulator from the front panel. If you don't, the Index 2XL LCD will refresh.

Ansur Test Guide

This manual includes tests unique to the Plug-In for the Simulator. For overall information on selecting and executing tests with Ansur software, please refer to the latest version of the *Ansur Executive Users Manual*.

When a test is executed with the Index 2XL Plug-in, the **TEST GUIDE** window opens. Use the **TEST GUIDE** to step through each element in the test procedure.

The **TEST GUIDE** has a:

- Center pane that displays either the default explanation or one entered when a custom template was created.
- **Test results** pane that displays results of the test being run.

For the Index 2XL Plug-In, when you execute a test, the **MTI** data pane appears by default as shown in Figure 3-1.

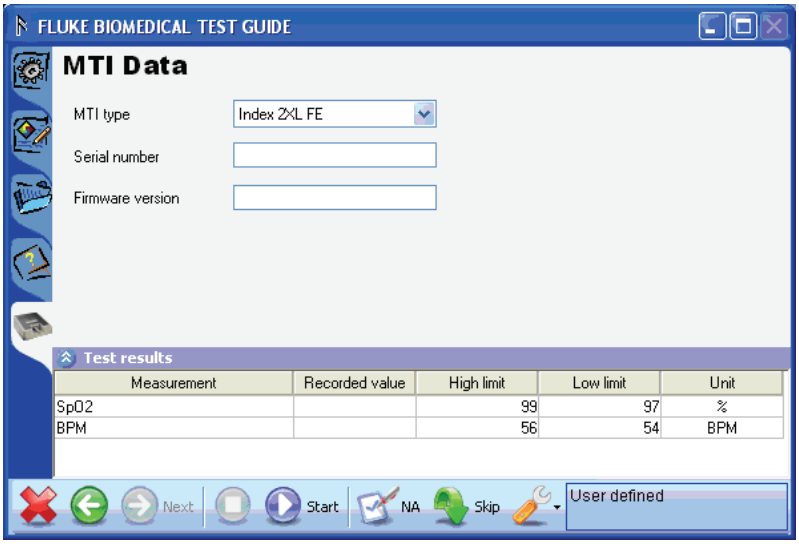

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Figure 3-1. Ansur Test Guide Window

Enter the MTI Data as follows:

1. Select the **MTI** type from the dropdown list.
   - For SpO2 Simulation test, Index 2XL FE or Index 2XL F type are available.
   - For Probe Tests, only Index 2XL FE type is available.
2. Enter the **Serial number** and **Firmware version**.
3. Click  to view the instructions to perform a particular test as shown in Figure 3-2.

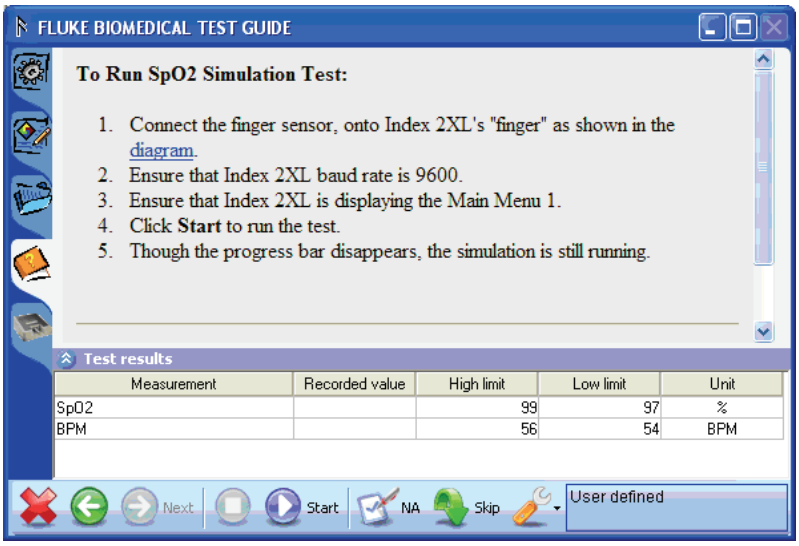

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Figure 3-2. Help Pane in Ansur Test Guide Window

4. Click **Start** on the **TEST GUIDE** toolbar to begin the test. Simulator starts simulating the results appear in the Oximeter. User has to enter results in the **Test results** pane.

Running an SpO2 Finger Simulation Test

To run an SpO2 finger stimulation test, proceed as follows:

1. Connect the finger probe of the pulse oximeter under test to the Index 2XL finger probe attachment. Position the pulse oximeter LEDs on the bottom of Index 2XL's finger probe attachment.
2. Click **Start** in the **TEST GUIDE** toolbar.
3. If the option **Send custom R-Curve to Index 2XL before performing the test** in **Custom setup** page is selected or the Index 2XL Plug-In cannot locate the custom R-curve selected in Custom setup page, the message in Figure 3-3 appears.

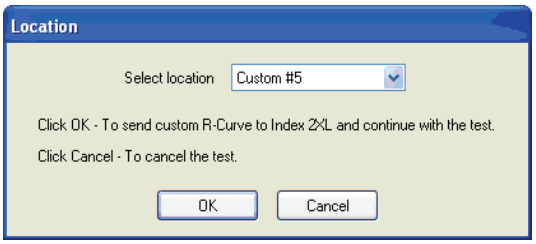

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Figure 3-3. Custom R-Curve Location Selection Dialog

4. Six locations are available to choose from in the **Select location** dropdown list, depending on the Light level selected in Custom R-Curve Generator window.
   - If the **Light level** is **Medium**, locations are Custom #1, Custom #2, Custom #3, and Custom #4.
   - If the **Light level** is **Low**, locations are Custom #5, and Custom #6.
5. Choose the location and click **OK**.
6. Note the **SpO2** and **BPM** reading.
7. Enter the **SpO2** and **BPM** values observed on the Oximeter monitor.

If at least one of the SpO2 and BPM values is outside the limits specified in the test procedure, the test is marked as failed.

8. Click **Next** to proceed or click **Start** to run the test again.
9. Click **Stop** in the **TEST GUIDE** toolbar to conclude the test.

Electrical testing of oximeters is similar to optical testing, except all simulations are output through the electrical port on the back of the Index 2. This eliminates the probe from the circuit.

Running Probe Tests

Index 2XL allows you to verify the electrical continuity and integrity of most oximeter probes.

To run a Probe Test:

1. Connect the probe under test to the back of the Index 2XL using the appropriate adapter cable. Refer to the Index 2XL Users Manual for connection instructions.

Note

During the Photodiode and resistance test, the finger probe being tested should not be attached to the Index 2XL finger.

2. Click **Start** in the **TEST GUIDE** toolbar.

   When the Simulator completes its measurements, Ansur retrieves the results from the Simulator and displays them in the Test Results pane.

   If at least any one of the result parameter is outside the limits specified in the test procedure, the test is marked as failed.

3. Click **Next** to proceed or click **Start** to run the test again.

LED Test

To run an LED Test:

1. Connect the probe under test to the back of the Index 2XL using the appropriate adapter cable, and connect the sensor to the artificial finger of the Simulator. Refer to the Index 2XL Users Manual for connection instructions.
2. Click **Start** in the **TEST GUIDE** toolbar.

   If at least one of the Red LED (LEDs - R), IR LED (LEDs - IR), and PHTO LED (LEDs - PHTO) values is outside the limits specified in the test procedure, the test is automatically marked as "failed."

3. Click **Next** to proceed or click **Start** to run the test again.
4. Click **Stop** in the **TEST GUIDE** toolbar to conclude the test.

Photodiode Test

In the Photodiode Test, results close to zero support a faulty probe diagnosis. To run a Photodiode Test:

1. Connect the probe under test to the back of the Index 2XL using the appropriate adapter cable. Refer to the Index 2XL Users Manual for connection instructions.

Note

For the Photodiode test, do not attach the finger probe being tested to the Index 2XL finger.

2. Click **Start** in the **TEST GUIDE** toolbar.

If at least any one of the Red Photodiode (Photodiode - R) and IR Photodiode (Photodiode -IR) values are outside the limits specified in the test procedure, the test is marked as failed.

3. Click **Next** to proceed or click **Start** to run the test again.
4. Click **Stop** in the **TEST GUIDE** toolbar to conclude the test.

Resistance Test

To run a Resistance Test:

1. Connect the probe under test to the back of the Index 2XL using the appropriate adapter cable. Refer to the Index 2XL Users Manual for connection instructions.

Note

For the Resistance test, do not attach the finger probe being tested to the Index 2XL finger.

2. Click **Start** in the **TEST GUIDE** toolbar.

   If at least any one of the Resistance values between the wires selected is outside the limits specified in the test procedure, the test is marked as failed.

3. Click **Next** to proceed or click **Start** to run the test again.
4. Click **Stop** in the **TEST GUIDE** toolbar to conclude the test.

Chapter 4
Index 2XL Test Templates

Introduction

This chapter introduces the specific template capabilities of the Index 2XL Plug-In and provides guidance for customizing test templates. General information on creating Ansur test templates can be found in the *Ansur Test Executive User Manual*.

Creating Test Templates

Create, modify, and review test templates using the Ansur **Main Application** window as a template editor. The Index 2XL Plug-In provides two test elements that are used to build new test procedures. These are accessible in the **Test Explorer** and are coded as follows:

- Light blue icon – the Detector automatically provides test result data to Ansur as the test is completed.
- Yellow icon – resultant data must be manually entered into Ansur by the user.

To build a test template, take the following actions, beginning at the **Main Application** window:

1. Drag a test element from the **Test Explorer** (left pane) into the **Test Template** (right pane), as displayed in Figure 4-1. Clicking the test element in the **Test Template** highlights the test element and its properties. In this illustration, the highlighted element is the **Index 2XL SpO2 Simulation Test**, and is the first test step to be performed.

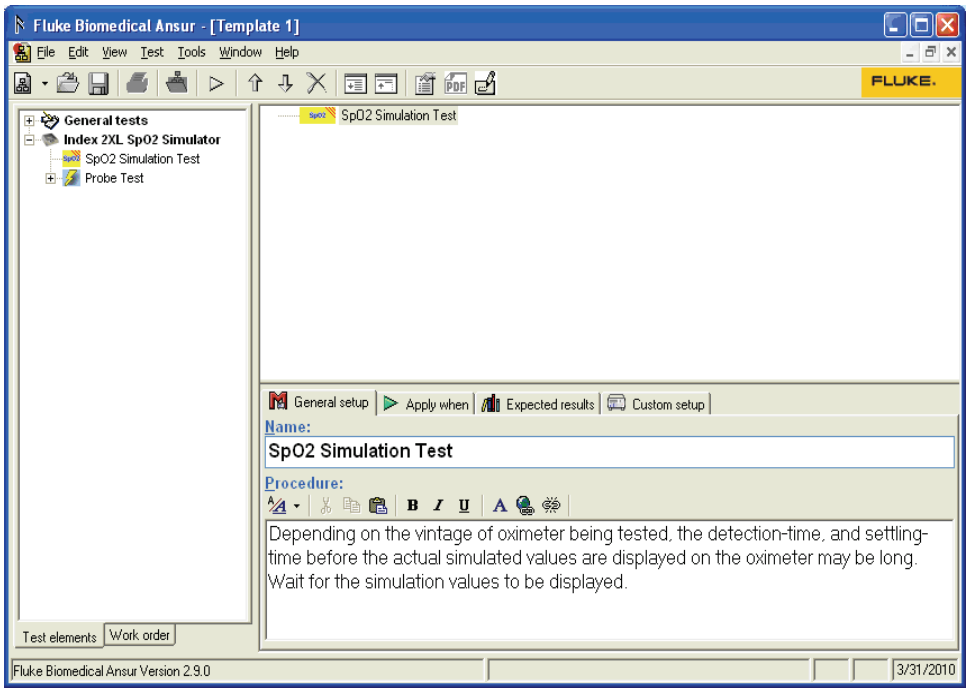

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Figure 4-1. Test Template with Selected Test Element

In the middle of the **Test Template** window are located the following tabs to allow definition of the properties of the highlighted test element.

- **General setup**
- **Apply when**
- **Expected results**
- **Custom setup**

Test element properties consist of multiple pages, described below.

2. Click the **General setup** tab. A screen opens, allowing entry of a name for the test. See Figure 4-2. In the space below the name, enter the procedures and instructions to be followed when conducting the test.

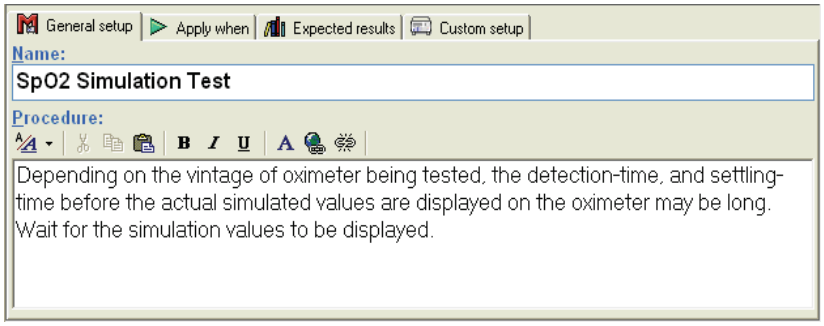

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Figure 4-2. User-Definable Parts of the General Setup Tab

3. Click the **Apply when** tab to assign report levels, standards, and service events to test elements. For more information about this feature, see the *Ansur Test Executive User Manual*.

4. Click the **Expected results** tab to view or change the measurement limits for tests, as shown in Figure 4-3.

Note

*The **Expected results** page is unavailable when test elements do not return measurement data.*

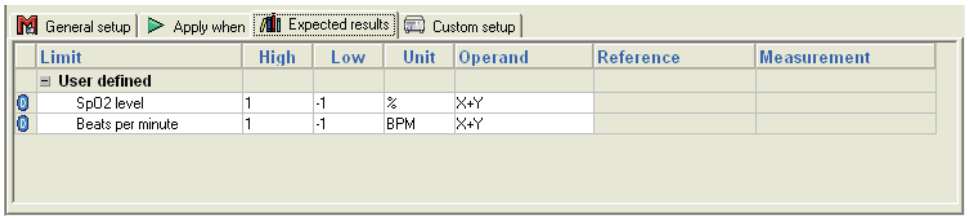

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Figure 4-3. Expected Results Options for User Input

5. To add or delete limits, right click one of the rows of the **Expected results** page and select from the pop-up menu, as shown in Figure 4-4.

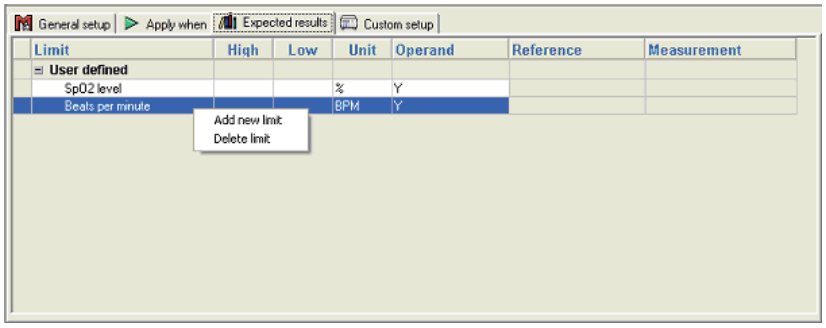

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Figure 4-4. Pop-Up Menu for Adding or Deleting Limits

6. Click the **Custom setup** tab to view and define the parameters used in tests. Test elements have unique custom setups for the capabilities they provide. An example is shown in Figure 4-5.

6. Click the **Custom setup** tab to view and define the parameters used in tests. Test elements have unique custom setups for the capabilities they provide. An example is shown in Figure 4-5.

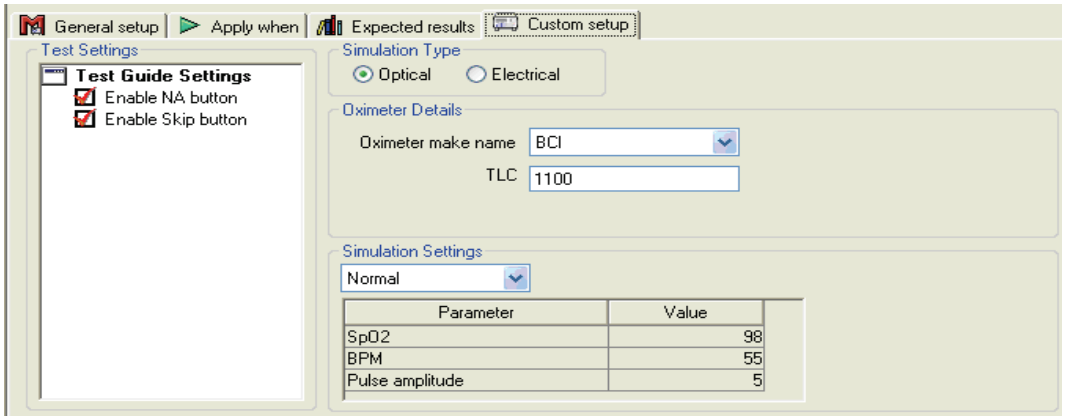

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Figure 4-5. Custom Setup Page for SpO2 Simulator Test Element

7. If desired, deselect (uncheck) either or both of the **Test Guide Settings** checkboxes to disable the **Skip** and **NA** button options.

8. The **Test Guide Settings** control whether certain test elements can be skipped altogether or marked as Not Applicable (NA) while the tests run. The **Skip** and **NA** buttons are enabled by default. If a setting is enabled, the corresponding **Skip** or **NA** button is available on the toolbar.

Using Index 2XL Test Elements

The test elements contained in the Index 2XL Plug-In are designed to test specific functional elements of a pulse oximeter. Tables 4-1 through 4-5 list the parameters that can be customized for each test element and the measurement data they provide.

SpO2 Simulation Test

Table 4-1. SpO2 Simulation Test Measurements

Measurement	Unit of Measure	Description
SpO2 level	%	Percentage of Oxygen in Oxygenated Blood.
Beats per minute	BPM	Pulse Rate.

Table 4-2. SpO2 Simulation Test Custom Parameters

Parameter	Description
Simulation Type	Allows you to choose between Optical and Electrical type of simulation.
Oximeter Details	Allows you to set the Oximeter make name, view the custom R-Curve, and an option to send the custom R-Curve to Index 2XL before performing the test.
Simulation Settings	Allows you to set the simulation settings from the dropdown list. For each simulation settings, the parameters **SpO2**, **BPM**, and **Pulse amplitude** are predefined. You can select **Customize** option from the **dropdown** list and enter your own values for SpO2, BPM, and Pulse amplitude. **SpO2** is the percentage of oxygen in oxygenated blood. **BPM** is the number of Pulses per Minute. **Pulse Amplitude** is the amplitude of the Pulse.

LED Test

Table 4-3. LED Test Measurements

Measurement	Unit of Measure	Description
LEDs – R	Volts	The voltage drop across LED - R.
LEDs – IR	Volts	The voltage drop across LED - IR.
LEDs – PHTO	Volts	The voltage drop across LED - PHTO.

Photodiode Test

Table 4-4. Photodiode Test Measurements

Measurement	Description
Photodiode - R	Response of photodiode – R.
Photodiode - IR	Response of photodiode – IR.

Resistance Test

Table 4-5. Resistance Test Measurements

Measurement	Unit of Measure	Description
Pin X to Pin Y	kilohms	Resistance between two wires X and Y. Note: Where X and Y are the pin numbers ranging from 1 to 13.