

Biomedical

Ansur ProSim[™] 6/8 Software Plug-In

Users Manual

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Chapter 1 Introduction

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About This Manual

This Users Manual contains information on how to install and use the Ansur ProSimTM 6/8 Plug-In (the Plug-In) with Ansur software. The manual includes all Plug-In features. Familiarity with the features of the Ansur software and Microsoft Windows will help in the design and use of tests for the ProSimTM 6/8 Vital Signs Simulator (the Simulator). The chapters in this manual are:

Chapter 1 "Introduction" provides information on Ansur software and the ProSim[™] 6/8 Plug-In.

Chapter 2 "Getting Started" provides information on how to install and configure the ProSimTM 6/8 Plug-In.

Chapter 3 "ProSimTM 6/8 Tests" provides step-by-step descriptions on how to perform the basic tasks of the ProSimTM 6/8 Plug-In.

Chapter 4 "Reference" contains details about every ProSim[™] 6/8 Plug-In feature and preferences.

Chapter 5 "ProSim[™] 8 Mini Plug-In" provides information on the ProSim[™] 8 Mini Plug-In.

Ansur Software

Ansur Test Automation software is the foundation for all Fluke Biomedical test systems. Ansur manages test procedures through manual/visual and automated test sequences.

The software used with Fluke Biomedical analyzers and simulators, makes a seamless integration for:

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

Ansur Plug-Ins

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

When you purchase a new Fluke Biomedical analyzer or simulator, you can update your Ansur software with a download of the applicable Plug-In. Each Plug-In module lets you make and do the tests that are necessary for the instrument under test.

ProSim[™] 6/8 Plug-In

The Plug-In supplies remote access to the ProSim[™] 6/8 Vital Signs Simulator (the Simulator).

Note

The ProSimTM 6/8 Vital Signs Simulator Users Manual contains information on the features and how to use the Simulator.

You can make Ansur tests with Plug-In test elements that include the functions of the Simulator. You can customize tests to analyze specific requirements. There are unique test elements for each of the tests, and simulations typically done through the Simulator.

Test Elements

The Simulator tests shown in Figure 1-1 are installed in the Ansur test explorer when the Plug-In is installed.



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The are three types of Plug-In test elements: Autosequence, Test Groups, and child test elements.

Figure 1-1. Simulator Tests in the Ansur Test Explorer

Autosequence is a test container that holds Simulator test elements. To make an Autosequence, you drag a test element from the test explorer window and drop the test into the Autosequence window. When you do an Autosequence, each test in the Autosequence container is done sequentially one after the other.

Note

An Autosequence made with the ProSim 6/8 Plug-In cannot contain test elements from other Ansur Plug-Ins.

Test Groups are specialized Autosequences, one for each group test (e.g. ECG Simulation test).

Child test elements are the actual tests which do the simulations and measurements. Tests identified by a light blue icon shows the Plug-In will automatically get the test results from the Simulator. Tests identified by a yellow icon shows the test results shown on the Device Under Test (DUT) must be typed into the Plug-In through the keyboard.

This Plug-In also includes Steps which are used to do parallel simulations equivalent to the simulator. An Autosequence container or the Test group becomes a step when it is put in a second Autosequence container.

Additional References

Answers to questions not found in this manual about how to use the Simulator or PC can be found in:

- Fluke Biomedical ProSim™6/8 Users Manual
- Fluke Biomedical Ansur Test Executive Users Manual
- Microsoft Windows Help and Support Center

Software Updates

Updates for Ansur are published on the Fluke Biomedical website, <u>http://www.flukebiomedical.com</u>.

Terms and Abbreviations

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

Term	Description	
Ansur	Ansur is a software suite using Plug-Ins to perform test and inspection procedures in conjunction with several Fluke Biomedical test instruments.	
DUT	Device Under Test - the equipment subjected to a test using the Analyzer.	
DUT Info	Information used to identify one particular DUT. DUT information usually consists of a serial number, manufacturer, device type and model. Ansur also adds a few extra data fields such as location and status.	
ProSim™ 6/8	Vital Signs Simulator from Fluke Biomedical.	
Field User	The person using Ansur to perform a test template on a 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 collect the measured data (if applicable).	
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 (*.MTT)	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.	
Autosequence file (*.PAS)	Set of simulations with many steps in an autosequence container. This is similar to the autosequence present in the simulator.	
Preset File (*.PRR)	Set of predefined presets loaded into the simulator.	

Table 1-1. Terms and Abbreviations

Term	Description	
R-Curve File (*.PRV)	R-Curve files compatible to the simulator.	
ProSim Test Results (*.CSV)	Test results which are stored in the simulator are copied to the PC.	

Table 1-1. Terms and Abbreviations (cont.)

Chapter 2 Getting Started

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Introduction

This chapter contains information on how to install the ProSim[™] 6/8 Plug-In and how to use it with the Ansur Test Automation software and the Simulator.

Note

A Simulator is not necessary to make test templates and experiment with the functionality available in Ansur and the Plug-In. To do a test, you must connect the Simulator to the computer.

System Requirements

The recommended minimum requirements for installation are:

- Pentium 4 2.0GHz FSB at 400 MHz or faster processor
- 1 GB of ram
- Microsoft Windows operating system (XP/Vista/Windows 7)
- Fluke Biomedical Ansur V2.9.6 or newer
- 50 MB of available hard drive for software
- Hard drive space (from 100 k to several megabytes) for result and template files
- DOT NET framework v2.0 or newer

How to Install the ProSim™6/8 Plug-In

The Plug-In must be installed on the computer before the features contained in this manual can be used. To learn how to get the Ansur software and the Plug-In, contact the local Fluke Biomedical representative or visit the Fluke Biomedical website (<u>http://www.flukebiomedical.com</u>).

Note

Ansur Test Executive version 2.9.6 or newer must be installed on your PC before you download and use the Plug-In.

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

Note

When you download the Plug-In from the Fluke Biomedical website, it is possible to run the installation without first downloading.

Note

When you install Ansur or its components/Plug-Ins on computers with Microsoft Vista or Microsoft Windows 7, it is important to do the installation as the Administrator for that computer. If you do not, the registry will not update and Ansur will not work properly. To install on Windows Vista, you must first download the file to your local computer, find the installation file, right-click and select "Run as Administrator."

1. Open **Windows Explorer** and browse to the ProSim[™] 6/8 Plug-In installation program file, usually named **Ansur ProSim 8 Plug-In Vn.n.n.exe**, where *n.n.n* is the Plug-In version number. See Figure 2-1.



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Figure 2-1. ProSim 6/8 Plug-In Installation File Location

- 2. Double-click the installation program. The installation extracts the Plug-In elements and then shows the **Welcome** dialog box in the display.
- 3. Click **Next** to show the license agreement.
- 4. Select the checkbox for "**I accept the terms in the license agreement**," and click **Next** to display the Setup Type.
- 5. To choose a setup type:
 - Click **Complete** to install both the ProSim 6/8 Plug-In and the ProSim 8 Mini Plug-In.
 - Click **Custom** to show the window in Figure 2-2 to install the ProSim 6/8 Plug-In or the ProSim 8 Mini Plug-In.
 - Click **Change** to install Ansur in a different folder.

Note

If Ansur is installed in a different destination folder from the default, be sure to use the same folder for the Plug-In.

🖟 Ansur ProSim 8 Plug-In - InstallShield Wizard	
Custom Setup	FLUKE.
Select the program features you want installed.	Biomedical
Click on an icon in the list below to change how a feature is in Ansur ProSim 6/8 Plug-In Ansur ProSim 8 Mini Plug-In	This feature requires 7027KB on your hard drive.
Install to: C:\Program Files\Fluke\Ansur\ InstallShield	<u>C</u> hange

gjp124.eps

Figure 2-2. Custom Setup Window

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

When the installation concludes, a dialog box with a Finish button shows in the display.

7. Click **Finish**. The Plug-In will load when Ansur is started.

How to Enter the License Key

When you use the Plug-In for the first time, you are prompted to type in a software

license key. This key is supplied by Fluke Biomedical at the time of purchase.

Note

Use the demonstration mode to make test templates without a license key. Demonstration mode lets you to do many of the tasks found in this user manual. You can not save or print without a Plug-In license key.

- 1. To start Ansur:
 - Double-click the **Ansur** icon on the desktop.
 - From the Start menu, select Start | Programs | Fluke | Ansur.

Note

The license key dialog box in Figure 2-3 shows in the display at startup if a Plug-In license key has not been typed in.

Ansur Registration
ProSim 6/8 Vital Signs Simulator
Please enter license key for the ProSim 6/8 Vital Signs Simulator Plug-In. This key will be specified on the license agreement provided with this product.
Establishment: Fluke
Demo OK Cancel

Figure 2-3. Ansur Registration Screen - License Key

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2. Type in the **Establishment** name and the Plug-In **License key**. If a license key is not available, click the **Demo** button to start Ansur in demonstration mode.

Note

Because the license key is derived from the establishment name, the license key and establishment name must agree with the license information provided by Fluke Biomedical. This information is case and space sensitive. If the establishment name was typed in before, this field will already be filled in

3. Click **OK** to start Ansur.

Click **Cancel** to stop the Plug-In load.

How to Uninstall the Plug-In

To uninstall the Plug-In:

- 1. Select Start | Control Panel and double-click Add or Remove Programs.
- 2. Find and select the entry named Ansur ProSim 6/8 Plug-In.

🕞 Ansur ProSim 6/8 Plug-In	Size	<u>1.86MB</u>
Click here for support information.	Used	rarely
To change this program or remove it from your computer, click Change or Remove.	Change	Remove

Figure 2-4. Removing ProSim 6/8 Plug-In

- gjp005.bmp
- 3. With the entry highlighted, click the **Remove** button as shown in Figure 2-4.

4. When the verify removal dialog box shows in the display, click **Yes**. A dialog box with a progress bar shows while the Plug-In is removed from the computer.

The program is removed when the Plug-In is not shown in the **Add or Remove Programs** window.

Chapter 3 ProSim™ 6/8 Tests

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Introduction

This chapter gives the operation of the Ansur ProSim[™] 6/8 Plug-In program.

How to Perform Simulation Tests

The Plug-In software has a number of ready-to-use test templates. When the Plug-In was installed, these templates were added to the Ansur Test Library folder.

How to Perform Tests without an Autosequence Container

As each test element in a test template is done, the instrument resets to its default or switches to the LOCAL mode. Test results are recorded individually. The switch to local is done after each test element when test elements are put in a template without an autosequence container.

To create a test template without an autosequence container:

- 1. Open Ansur. Use the desktop icon or click Ansur from the start menu.
- 2. Drag and drop test elements from the Ansur Test Explorer to the test template. Figure 3-1 shows three test elements in the test template: Normal Sinus Rhythm Test, Arrhythmia Test, and NIBP Leak Test.



Figure 3-1. Test Template without Autosequence Container

3. Click **Test | Start Test** on the menu bar to show the Test Guide window shown in Figure 3-2.



Figure 3-2. Test Guide for Normal Sinus Rhythm Test

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- 4. Click 2 to start the normal sinus rhythm test. A progress bar shows in the lower-right corner of the Test Guide window.
- 5. At the end of the test duration, or if you click to stop the test, the cursor is placed in the value field of the test results pane. See Figure 3-3.

	Test results				
	Measurement	Preset Value	Value	High Limit	Low
	Heart Rate	60 BPM	60	500 BPM	0
	<				>
×	🔆 📀 🕞 Next 🔲 🔘 Start 💇 NA	Skip 🧹	User der STEP CO	fined OMPLETED: PA	SSED

Figure 3-3. Test Results Pane for Normal Sinus Rhythm Test

gjp082.bmp

- 6. After you enter the test results value(s), click 2 to move to the next test element in the test template. In this example, the Arrhythmia Test.
- 7. Click 2 to start the arrhythmia test. A progress bar shows in the lower-right corner of the Test Guide window.
- 8. At the end of the test duration, or if you click ⁽⁾ to stop the test, the test results pane shown in Figure 3-4 shows in the display.

	Test results			
	Description	Test passed	Test failed	
	Atrial Fibrillation Coarse			
×		Start NA	Skip 🥖 🗸 Test in pro	gress, please wait

Figure 3-4. Test Results Pane for Arrhythmia Test

- gjb083.bmp
- 9. Click the Test passed or Test failed checkbox to set the arrhythmia test results.
- 10. Click 2 to move to the third test element in the test template example. In this example, the NIBP Leak Test.

- 11. Click 2 to start the NIBP test. A progress bar shows in the lower-right corner of the Test Guide window.
- 12. At the end of the test duration, or if you click ⁽²⁾ to stop the test, the test results pane shown in Figure 3-5 shows in the display. The test results for the NIBP test comes from the Simulator and therefore does not require a manual input.

	Test results				
	Measurement	Value	High Limit	Low Limit	
	Leak Rate	+008.2			
×	Start O Start	🔨 NA		defined COMPLETED:	PASSED

Figure 3-5. Test Results Pane for NIBP Tests

gjp084.bmp

13. Click 2 to show the test summary window shown in Figure 3-6.

FL	UKE BIOMEDICAL TEST GUIDE					(
	Test Summary						
B	The test is completed. Press Next to create a test record, or Previous to repeat any of the tests.						
	😵 Test Results						
	Test element	Status	Value	High limit	Low limit	Unit	Flags
	PSM 🖁 Normal Sinus Rhythm Test	Test passed	60	500	0	BPM	
	💦 🕂 Arrhythmia Test	Test passed	Pass				
	NIBP Leak Test	Test passed	+008.2			mmHg/min	
×	🔆 📀 Next 🔲 🕕	Start 📴	NA 🔬 S	ikip 🦉	User defin STEP CO	ned WPLETED:	PASSED

gjp085.bmp

- Figure 3-6. Test Summary Window
- 14. Click 0 to show the test results file shown in Figure 3-7.



Figure 3-7. Test Results File

How to Perform Tests with an Autosequence Container

As each test element in a test template is done, test results are recorded individually. The instrument resets to its default or switches to the LOCAL mode after all the test elements are done. The switch to local is done after all test elements when test elements are put in a test template and within an autosequence container.

To create a template with an autosequence container:

- 1. Open Ansur. Use the desktop icon or click Ansur from the start menu.
- 2. Drag and drop an Autosequence container from the Ansur Test Explorer to the test template. Figure 3-8 shows three test elements in an autosequence container in a test template: Normal Sinus Rhythm Test, Arrhythmia Test, and NIBP Leak Test.



Figure 3-8. Test Template with Autosequence Container

3. Click **Test | Start Test** on the menu bar to show the Test Guide window shown in Figure 3-9.

🖡 FL	UKE BIOMEDICAL TEST GUIDE		
	Autosequence		
			 1. Click 'Start' to begin the test. 2. Sending commands to Instrument 3. Simulating waveform on the monitor. 4. Click 'Stop' to end the test.
	Test results		
	Measurement	Preset Valu	ie Value High Limit
	Autosequence ECG Simulation Test - Normal Sinus Rhythm Test ECG Simulation Test - Arrhythmia Test NIBP Test - NIBP Leak Test	60 BPI	M 500 BPM
	<		>
×	Next 🔘 🔘 Start 🗹 NA	Skip	User defined

Figure 3-9. Autosequence Test Guide

gjp088.bmp

4. Click ^Q to start the test. ECG Simulation Test – Normal Sinus Rhythm Test is the first test element. A pop-up window shows in the display that identifies the test and counts down the duration time. A progress bar shows in the lower-right corner of the test guide window. You can also click the **Stop** button in the pop-up window to stop the test. See Figure 3-10.



gjp089.bmp

5. At the end of the test duration, or if you click the **Stop** button to stop the test, another pop-up window shows in the display where you enter the observed value from the DUT. See Figure 3-11.



Figure 3-11. Test Results Entry for Normal Sinus Rhythm Test in an Autosequence

6. Click the **OK** button. Ansur records the value you typed in and moves to the next test element. ECG Simulation Test – Arrhythmia Test in this example.

The instrument does not reset to LOCAL mode. The simulation continues until the results for all test elements are recorded.

Note

7. Another pop-up window shows with the test name and duration count down. When the test element stops, a pop-up test result window shows in the display. See Figure 3-12.



gjp091.bmp

gjp090.bmp

- Figure 3-12. Arrythmia Test Results Window in an Autosequence
- 8. Click the **Pass** or **Fail** button in the test result window. The results are recorded and Ansur moves to the next test element. The next test element in this example is the NIBP Leak Test. See Figure 3-13.

FLUKE BIOMEDICAL TEST GUIDE	
Autosequence	
1. Attach e the ProSin 2. Click 'St the test	equipment to n 6/8. art' to begin
Test Result	essure
0	end the
Clicking on 'Stop' button will stop this test	stem to
☆ Test	
Measurement rieset value value	rngrreimit L 🛆
ECG Simulation Test - Normal Sinus Rhythm Test 60 BPM 9 ECG Simulation Test - Arnhythmia Test Pass NIBP Test - NIBP Leak Test	500 BPM
	~
	>
🗱 💿 💿 Next 🔘 💽 Start 📝 NA 🌯 Skip 🧨 - 🎹) gress, please wait

Figure 3-13. NIBP Leak Test in an Autosequence

gjp092.bmp

9. When the NIBP Leak Test is done, the results are automatically retrieved from the Simulator and show in the **Test results** pane of the test guide. See Figure 3-14.

🖡 FL	FLUKE BIOMEDICAL TEST GUIDE					
	Autosequence					
			 1. Attack the ProS 2. Click ' the test. 3. Wait fi to be rest. 4. Click ' test. 5. Wait fi vent. 	equipment tr Sim 6/8. Start' to begin or the pressu ached. Stop' to end t or the system	n re he to	
	Test results					
	Measurement	Preset Value	Value	High Limit	۱.	
	ECG Simulation Test - Normal Sinus Rhythm Test ECG Simulation Test - Arrhythmia Test	60 BPM	60 Pass	500 BPM		
	NIBP Test - NIBP Leak Test		+226.6		~	
	<				>	
×	🔆 📀 💽 Next 🔲 💽 Start 🗹 N	A	User der STEP CO	ined MPLETED: P	ASSED	

Figure 3-14. NIBP Leak Test Results

gjp093.bmp

If there was another test element after the NIBP Leak test, Ansur would automatically do the next test after the NIBP Leak test results were retrieved from the Simulator. In this example, the NIBP Leak test is the last test element in the autosequence container.

10. Click 0 to show the test summary window shown in Figure 3-15.

₿ FL	UKE BIOMEDICAL TEST GUIDE						
1	Test Summary						
B	The test is completed. Press Next to create a test record, or Previous to repeat any of the tests.						
	🍣 Test Results						
	Test element	Status	Value	High limit	Low limit	Unit	Flags
	Autosequence	Test passed Test passed Test passed	60 Pass	500	0	BPM	
	NIBP Leak Test	Test passed	+226.6			mmHg/min	
×	(G) (D) Next	Start		ikip 🥖 🗸	User defi STEP CO	ned MPLETED:	PASSED

Figure 3-15. Test Summary after Autosequence

gjp094.bmp

11. Click O to show the test results file shown in Figure 3-16.



Figure 3-16. Test Results after Autosequence

How to Perform Tests with Autosequence and Step Container

When an autosequence is placed within another autosequence container in a template, the new autosequence container becomes a step within the first autosequence. As a result, all test elements within the step are done simultaneously, or in parallel. This is similar to how the autosequence built into the Simulator works.

When the test results for each of the test elements in a step are obtained, Ansur moves to the next step in the autosequence. The following explanation will use the Monitoring Testing autosequence as an example of an autosequence with a step container.

To open the Monitoring Testing template from the Ansur test library:

- 1. Click **File | Open** on the menu bar or click *b* on the main toolbar.
- 2. Browse to the folder where Ansur was installed and double-click the Ansur Test Library folder. See Figure 3-17. The usual location is C:\Program Files\Fluke but can have a different name.



Figure 3-17. Browsing the Ansur Test Library

3. Double-click the ProSim 8 folder to open the dialog box shown in Figure 3-18. The dialog box shows the generic test templates and the default templates in the factory templates director.



gjp096.bmp

gjp007.bmp

Figure 3-18. Generic and Factory Templates

4. Double-click **Factory Templates** directory to open the dialog box shown in Figure 3-19.



Figure 3-19. ProSim 8 Plug-In Templates

gjp121.bmp

5. Highlight Monitor Testing.mtt and click the **Open** button to open the template shown in Figure 3-20.



Figure 3-20. Monitor Testing Template

As Figure 3-20 shows, there is one Auto Sequence container that contains three more Auto Sequence containers, or steps. Each step has a test for ECG signal (Normal Sinus Rhythm), respiration, temperature, IBP, NIBP, and Oximeter SpO2 optical emitter and detector testing. The three steps have been labeled NSR (Adult) 200 bpm, NSR (Adult) 80 bpm, and NSR (Adult) 30 bpm.

- 1. To do the Auto Sequence and the steps within:
- 2. Click **Start | Test** from the main menu or click ≥ on the main toolbar to open the test guide shown in Figure 3-21.

₿ Mo	onitor Testing.mtt			_	
	Autosequence				
2			1. Click the test. 2. Sendi	'Start' to begi ina commana	n is to O
	😵 Test results				
B	Measurement	Preset Value	Value	High Limit	L ^
	Autosequence NSR (Adut) 200 bpm ECG Simulation Test - Normal Sinus Rhythm Test Respiration Simulation Test IBP Simulation Test - IBP Dynamic Simulation Test Systolic of channel 1 Diastolic of channel 1 Systolic of channel 2 Diastolic of channel 2 NIBP Test - NIBP Dynamic Simulation Test	200 BPM 80 brpm 42 °C 200.00 mmHg 150.00 mmHg 45.00 mmHg 25.00 mmHg		500 BPM 100 °C 400 mmHg 400 mmHg 400 mmHg 400 mmHg	
	Systolic Diastolic Heat Rate MAP Sp02 Test	200.00 mmHg 150.00 mmHg 200 BPM 166.00 mmHg 100 %			~
×	Next 🔘 💽 Start 🔯	🔨 NA	Star de	fined	

Figure 3-21. Autosequence Test Step Test Guide

```
gjp098.bmp
```

3. Click \square to start the auto sequence.

The test results pane in Figure 3-22 shows in the bottom of the test guide window.



Figure 3-22. Step Test Results Pane

gjp099.bmp

4. The test results pane shows the step number and name. A count down of the time remaining in the step duration is also shown. If you want to move to the next step before the duration time is completed, click the **Next Step** button. When you click on the Next Step button or the duration time completes, Ansur shows the test results values for the step just completed. See Figure 3-23.

Renitor Testing.mtt							
8	Autosequence						
				 1. Click 'Start' to begin the test. 2. Sending commands to Instrument 3. Simulating Autocompose in the 			
	Test results						
	Description	Preset Value	Value	High Limit	Low Limit		
	Normal Sinus Rhythm Test	000 0014	000	500 0014	0.0014	_	
	Heart Kate	200 BPM	200	200 BPM	0 BPM	_	
	Respiration Simulation Test	001				_	
		80 brpm	Pass				
	Temperature Simulation Test	10.00		400.00		-	
	Temperature	42 °C	42	100 °C	0.0	_	
	IBP Dynamic Simulation Test	000.00	000	400 11		-	
	Systolic of channel 1	200.00 mmHg	200	400 mmHg	0 mmHg	_	
	Diastolic of channel 1	150.00 mmHg	150	400 mmHg	0 mmHg	_	
	Systolic of channel 2	45.00 mmHg	45	400 mmHg	0 mmHg	_	
	Diastolic of channel 2	25.00 mmHg	25	400 mmHg	0 mmHg	_	
	NIBP Dynamic Simulation Test					_	
	Systolic	200.00 mmHg	200			_	
	Diastolic	150.00 mmHg	150				
	Heart Rate	200 BPM	200				
	MAP	166.00 mmHg	166.67				
	SpO2 Test						
	SpO2	100 %	Pass 🛛 🐱				
					<u>0</u> k		
×	Kext 🔘 Kext	BY NA	Skip 🥖	• Step 1 in pro	gress, please		

Figure 3-23. Step Test Results Screen

gjp100.bmp

- 5. Enter the values observed on the DUT into the appropriate value field in the test results pane.
- 6. Click **OK** to start the next step.

For steps that are between other steps, the test results screen in Figure 3-24 shows in the display.



Figure 3-24. Step Test Results for In Between Steps

Gjp101.bmp

This screen has **Previous Step** and **Next Step** buttons. Both buttons will move to the test results screen of the present step for entry of results values. The previous step button will go back and do the previous step when you click **OK** in the results screen. Ansur does the next step if you clicked the next step button.

For the last step in an auto sequence, the test results screen in Figure 3-25 shows in the display.
gjp102.bmp

	☆ Test results
	Step 3/3: NSR (Adult) 30 bpm
	08:56
	Previous Step Repeat
X	🔆 💮 🕞 Next 🔲 💽 Start 📝 NA 🔍 Skip 🥢 🖓 Step 3 in progress, please wait

Figure 3-25. Step Test Results for Last Step

The **Repeat** button will stop the present step and show the results screen to allow you to enter test results. Then when you click OK in the test results pane, Ansur will do the first step in the auto sequence.

- 7. Click to stop the autosequence and enter the test results of the last step.
- 8. Click 0 to show the test summary window shown in Figure 3-26.

№ м	onitor Testing.mtt					(\mathbf{X}		
1	Test Summary									
13	The test is completed. Press Next to create a test record, or Previous to repeat any of the tests.									
	Test Results									
	Test element	Status	Value	High limit	Low limit	Unit	Flags	^		
	 PSM Autosequence PSM NSR (Adult) 200 bpm 	Test passed Test passed								
	🏹 🖁 Normal Sinus Rhythm T	eTest passed	200	500	0	BPM				
	FRANS Respiration Simulation	l Test passed	Pass			brpm				
	Temperature Simulation	i Test passed	42	100	0	°C				
	🖂 📷 IBP Dynamic Simulation	n Test passed								
	Systolic of channel 1		200	400	0	mmHg		-		
	Diastolic of channel 1		150	400	0	mmHg				
	Systolic of channel 2		45	400	0	mmHg				
	Diastolic of channel 2		25	400	0	mmHg				
	Simulati	o Lest passed								
	Systolic		200			mmHg				
	Heart Bate		200			BPM				
	MAP		166.67			mmHa				
	Sp02 Test	Test passed	Pass			%				
	E DOM NSB (Adult) 80 bom	Test passed				-				
	Normal Sinus Rhythm T	eTest passed	80	500	0	BPM		~		
×	S (S) (S) Next (D) (S) St	art 💽 NA	Skip	Seler STEP	ted standar	d: User defi D: PASSED	ned			

Figure 3-26. Test Summary of Stepped Autosequence

gjp103.bmp

9. Click 0 to show the test results file shown in Figure 3-27.



Figure 3-27. Test Results File for Stepped Autosequence

gjp104.bmp

How to Save a Test Record or Template

You can keep each test record and Plug-In test template as a file on the PC. To save a test record or template:

1. Click **File | Save** on the main menu or click **I** in the toolbar. The **Save As** dialog box shown in Figure 3-28 shows in the display.

Save As						? 🔀
Save in:	My Documents	3	~	G 🦻	بي 🥙	
My Recent Documents						
My Documents						
My Computer		[
	File <u>n</u> ame:	IEC 60601-1 - CL1			*	Save
	Save as type:	Test records (*.mtr)			*	Cancel
My Network						

gbv024.bmp

2. Browse to the correct location and type in a name in the **File name** field and click **Save**. The file is saved and the Ansur title bar is updated with the new name.

Figure 3-28. Save As Dialog Box

How to Print a Test Report

Test reports can be printed in three different formats from the test record:

- **Summary** A report with DUT data and the overall status of the safety test. This one-page report is good for a simple Pass or Fail report.
- **Condensed** A report with the summary report data as well as each test element on a one line that shows if the test passed or failed.
- **Detailed** A report with the summary and condensed data along with all configuration test result data as well as applied part setup data.
- 1. With the Test Report open, click **File | Print** or click in the toolbar to open the Print Report window shown in Figure 3-29.

Print report							
Printer							
\\DVSERVER\HP LaserJet 4100 PCL 6	Printer setup						
Show preview							
Report type	What to print						
Summary	Configuration						
◯ Condensed	✓ Test results						
 Detailed 	Graphics						
Select the printer to be used and what to print on the report. A summary report will include only the first page. A condensed report will print one line for each test, where as a detailed report will print all test results.							
Printer Setup Report Configuration							
	Print Cancel						

Figure 3-29. Print Report Window

gbv26.bmp

- 2. Select a report type option (summary, condensed, or detailed).
- 3. Click **Print** to show the print preview window in Figure 3-30.

Print prev ⇒ ↓ ↓ ∴ × ×	iew Fluke Biol Test and Insp Copylor & 2000 - 2010 Fluke Biomedical Test record	medical Ans ection Procedur	30 S Uľ 'e),2011
	Teri performed Date: 320/2 Record: Manic Record: Sequer Tamplate: Manic Sequer Test setup Selections	Ansur components used 11 Ansur a Testing Ping-In ProSim a Testing Ke 2001	Versian 29.6 Versian 1.0.0	
	Service orns performed Device under test Serial romber Applance code Croup Satus Marofactmer Signatures	Standar de performed User defined Type Model Location Address 1 Address 2	\bigcirc	
Monitor Testing S	equence.mtr	Detailed report	Page 1 of 2	Zoom: 75%

Figure 3-30. Print Preview of Test Report

3. Click 🗁 in the upper left-hand corner of the preview window to print the report.

Note

To skip the preview before printing, uncheck the Show Preview checkbox in the print report window shown in Figure 3-29.

How to Export a Report to PDF

To keep a test report in Adobe (pdf) format:

1. Click **File | Export to PDF** on the main menu (See Figure 3-31) or click () on the main toolbar.



Figure 3-31. Save Test Record to PDF File

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How to Create a Test Template

A test template is an Ansur file that holds a set of test elements that make a test for an applicable DUT. The test template can be used on other DUTs of the same type. A test template can also contain instructions on how to do preventive maintenance, make repairs, and other tasks on a DUT.

To create a new test template:

- 1. Open an empty test template. Click **File | New | Template** or click **a** on the main toolbar.
- 2. In the test explorer window, click on the plus button (⊞) to the left of the ProSim 6/8 Vital Signs Simulator entry to expand the entries for this Simulator.
- 3. Click and drag a test element from the Test Explorer (left pane) to the Test Template window (right pane). The example shown in Figure 3-32, shows the NIBP Dynamic Simulation Test element in the test template.



Figure 3-32. Test Template with NIBP Dynamic Test Added

Repeat step 3 for each test element required in the template.

Below the template window, a number of test element setup tabs are shown. Table 3-1 is a list of these tabs and their function.

Table	3-1.	Test	Element	Setup	Tabs
-------	------	------	---------	-------	------

Tab Name	Function
General setup	Contains the test element name and the procedure description to show to the user.
Apply when	Used to set when the test is done, set the standards with limit assignments, and if the test results must show up in the report.
Expected results	A table of all test results for the test element where absolute, dynamic, and relative limits are set for the test.
Custom setup	Used to set different parameters for the test element. Not all test elements will have parameters that can be set in this window.

How to Name a Template

When you make a new test template, you must give it a name. To name the test template:

- 1. Click the **General setup** tab in the test template window.
- 2. Type a name in the Name field of the general setup window as shown in Figure 3-33.

🕅 General setup 🕨 Apply when 🛛 🎢 Expected results 🕅 🖾 Custom setup
Name:
NIBP Dynamic Simulation Test
Procedure:
¹ ∕ <u>A</u> ▼ ½ Pa C <mark>B</mark> / <u>U</u> A C G ∰

Figure 3-33. Custom Setup Test Element Name

3. Add text to the Procedure field to instruct the user on the test. See the *Ansur Test Executive Users Manual* to learn more about what can be put into the procedure field.

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gip925.bmp

The **Apply when** tab is used to set which standard or established process the test element uses to compare test results against. For the ProSim 6/8 test elements, only the user defined standard is available.

How to Set Expected Results

Each test element has one or more values that tell how a DUT performed during the test. The Expected results tab shows the results a test element can use to evaluate a DUT. If you click the **Expected results** tab just after you add a test element to the template, all the results values will show in the window. Figure 3-34 shows the results for the NIBP Dynamic Simulation Test element and the four parameters that could be used to measure DUT performance.

M General setup 🏷 Apply when 📶 Expected results 🖾 Custom setup							
	Limit	High	Low	Unit	Operand	Reference	Measurement
Г	User defined						
	Systolic			mmHg			
	Diastolic			mmHg			
	Heart Rate			BPM			
	MAP			mmHg			

Figure 3-34. Expected Results Window

Some test parameters may not be applicable to some DUTs. To remove a value as a test result, right-click on the grey box to the left of the limit name. The pop-up menu shown in Figure 3-35 will show in the display. Click on **Delete limit** to remove that value from the expected results.

🕅 General setup 🗍	> Apply when	/1 Expecte	ed results	📖 Custor	n setup			
Limit		High	Low	Unit	Operand	Reference	Measurement	
🗉 User defined	l							
Systolic				mmHg				
Diastolic				mmHg				
Heart Rate				BPM				
MAP	Add new limit Delete limit			mmHg				

Figure 3-35. Delete Result Value

To set the expected results:

- 1. Click in the **High** column of a limit row.
- 2. Type in the high value for that test parameter.
- 3. Tab to the **Low** column.
- 4. Type in the low value for that test parameter.

Repeat these four steps for each parameter used to evaluate the performance of the DUT.

How to Set Test Equipment Parameters

The **Custom setup** tab is used to set variables in the test equipment used on a DUT. In this case, a ProSim 6 or 8 Vital Signs Simulator. Figure 3-36 shows the custom setup window for the NIBP function of the Simulator.

Note

Click and hold on a slider control and drag it to change the parameter value. You can push \leftarrow and \rightarrow keyboard keys to change the value in single steps for a finer adjustment.

Arrhythmia None Vation Systolic Pressure 120 mmHg Adult Vation Selected Preset 120/80 (90) MmHg Pulse Volume Heart Rate 60 BPM 1.00 MmL
Select ProSim Model, Patient, Selected Preset and related settings for the NIBP Dynamic Simulation Test. Default Pressure unit is as selected in Preference window.

Figure 3-36. Custom Setup Window for NIBP Dynamic Simulation Test

This window shows all the parameters that can be changed for the NIBP function. Refer to the *ProSim*TM 6/8 Users Manual to learn more about these parameters and their limits. In addition, you can set the duration of the test from one second to indefinite. You can also enable or disable the Skip and NA buttons in the test guide window.

Refer to Chapter 4 (Reference) to learn more about the custom parameters you can set for each function of the Simulator though Ansur.

How to Create an Autosequence with Steps

To create an autosequence that has steps, you create a template that has an Auto Sequence container in it and then put another Auto Sequence container inside the first Auto Sequence container. The second Auto Sequence container then becomes a Step container. You then place test elements inside the step container.

The result of this is that when this step container is executed, all the test elements within the step are started at the same time. This is similar to how the Autosequence feature built-in to the ProSim 8 performs.

When multiple steps are put into one Auto Sequence container, each step is automatically started when the test results are entered for the present step. The automatic execution of the steps continue until all steps have been done or the user aborts the autosequence.

To create a template with an autosequence with steps:

- 1. Open an empty test template. Click **File | New | Template** or click **&** on the main toolbar.
- 2. In the test explorer window, click on the plus button (⊞) to the left of the ProSim 6/8 Vital Signs Simulator entry to expand the entries for this Simulator.
- 3. Drag an Auto Sequence container from the Test Explorer window to the Template window, as shown in Figure 3-37.



Figure 3-37. Drag Auto Sequence Container to Template

- 3/F · · · · · · · F
- 4. Drag another Autosequence container from the Test Explorer window to the template window but place it on top of the first Auto Sequence icon. It will put the container under the Auto Sequence icon and label the new container Step. See Figure 3-38.

gjp106.eps

Fluke Biomedical Ansur - [Template 1]			
🕵 Eile Edit View Iest Tools Window Help			- 8 ×
🔉 · 🗁 🔚 🚄 🤌 👘 👘 🗸 👘			FLUKE.
Ceneral Cote ProSit	Po dutosequence		
•••••••••••••••••••••••••••••••	e: p redure:		
NIP Test NIP Test NIP Lest NIP Lest NIP Lest Test NIP Lest Test NIP Pressure Relief Test NIP Pressure Source Test NIP Pressure Source Test Sp02Test	• あ 哈 隆 B / U	A 🥵 🐡	
Test elements Work order			
Fluke Biomedical Ansur Version 2.9.6		*** DEMO ***	5/3/2011

Figure 3-38. Drag Auto Sequence Container to Template to Create Step Container

- 5. Drag any test elements from the Test Explorer window and place it on top of the Step icon. The test element will be shown under the step icon.
- 6. Set the parameters of the test element through the **Custom Setup** and **Expected test results** tabs. See the How to Set Test Equipment Parameters and How to Set Expected Results sections to learn more on how to set up test elements.
- 7. Repeat step 6 for each test element you want in the step.

Note

To add another step, drag an Auto Sequence container from the Test Explorer and place over the first Auto Sequence icon in the template window.

8. Figure 3-39 shows a template with an autosequence that has three steps. Each step has six different test elements to set the parameters in the Simulator.



Figure 3-39. Complete Autosequence with Three Steps

9. Click \blacksquare to save the template.

Chapter 4 **Reference**

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Introduction

Each test element in this Plug-In have parameters that can be set and loaded into the Simulator when Ansur does the test. These test parameters are set through the custom setup window of a test template.

ProSim[™] 6/8 Test Elements

This chapter provides data on the custom setup parameters for each test element of this Simulator. To see each of the following custom setup windows, drag and drop the test element from the test explorer window to the test template window. Next, click on the **Custom setup** tab.

Respiration Simulation Test

This is a visual test. The Simulator does not make a measurement. Figure 4-1 shows the custom setup window for the respiration simulation test element.

Wave Normal	Rate Apnea 80 brpm	Baseline 1000 💌 Ohm	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Amplitude 0.95 Ohm Duration Indefinite	Ratio 1:1	Respiration Lead	
Select Wave, Rate, Baseline, Ra	stion, Respiration Lead, Amplitude and desir	red duration for the Respiration Simula	tion Test.

Figure 4-1. Respiration Simulation Custom Setup

Table 4-1 is a list of the parameters and their description for the respiration simulation test element.

Note

To change slider values, click and hold on the slider control and drag it to change the parameter value. Use \leftarrow and \rightarrow keyboard keys to adjust the value in single steps.

Parameter	Description		
Wave	Sets the wave to use for the test.		
Rate	Sets the respiration rate to use for the test.		
Amplitude	Sets the amplitude to use for the test.		
Baseline	Sets the baseline to use for the test.		
Ratio	Sets the ratio for normal waves in the test. Ventilated ratio is always 1:1.		
Respiration Lead	Sets lead the respiration will be simulated on.		
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.		

Temperature Simulation Test

This is a visual test. The Simulator does not make a measurement. Figure 4-2 shows the custom setup window for the temperature simulation test.

M General setup 🕨 Apply when 🕅 📶 Expected results 🖾 Custom setup	
Temperature 37.0 *C Duration Indefinite 15 s	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Select Temperature and desired duration for the Temperature Simulation Test.	

Figure 4-2. Temperature Simulation Test Custom Setup

Table 4-2 is a list of the parameters and their description for the respiration simulation test element.

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Table 4-2. Temperature Simulation Test Custom Parameters

Parameter	Description		
Temperature	Sets the temperature to use for the test.		
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.		

Cardiac Output Simulation Test

This is a visual test. The Simulator does not make a measurement. Figure 4-3 shows the custom setup window for the cardiac output simulation test.

			Test Guide Settin	ngs
			Enable Skip	utton
1 💌				
ie Temperature	Injectate Temperature	Cal Coefficient		
℃	0 🔽 °C	0.542		
ı 🔲 Indefinite	15 s			
	njectate and desired durat	tion for the Cardiac Output Sim	ulation Test. Default ProSim Model is a:	s seler

Figure 4-3. Cardiac Output Simulation Test Custom Setup

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Table 4-3 is a list of the parameters and their description for the cardiac output simulation test element.

Parameter	Description		
Wave	Sets the wave to use for the test.		
Baseline Temperature	Sets the baseline temperature to use for the test.		
Injectate Temperature	Sets the injectate temperature to use for the test.		
Cal Coefficient	Calibration coefficient for the injectate temparture.		
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.		

Table 4-3. Cardiac Output Simulation Test Custom Parameters

Oximeter SpO2 Optical Emitter and Detector Test

This is a visual test. The device does not make a measurement. Figures 4-4 and 4-5 shows the custom setup windows for the test. All Oximeter SpO2 optical Emitter and Detector tests for all pulse oximeter manufacturers except Masimo Rainbow use the standard SpO2 custom setup.

General setup ► Apply when Custom ProSim Model Heat Rate ProSim 8 ► Brand ► Nellcor ► Ambient Light Off Off ▼ Respiration 0ff Off ▼ Duration Indefinite	setup 60 BPM Sp02 Saturation 97 % 3.0 %	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Select ProSim Model, Brand and related settings	for the SpO2 Test.	
	*** DEMO ***	8/29/2011

Figure 4-4. Standard Oximeter SpO2 Optical Emitter and Detector Custom Setup

ProSim Model ProSim 8 Brand Masimo Rainbow Ambient Light Off Off Transmission Medium Finger Respiration Off Qff Qff Samo Respiration Off Qff Qff Samo Respiration Off Qff Qff Qff Qff Qff Qff Qff	Heart Rate 60 BPM	SpMet 0.9 % SpMet 0.9 % SpCo 2.1 %	Test Guide Settings ♥ Enable Skip button ♥ Enable NA button
Select ProSim Model, Brand a	nd related settings for the SpO2 Test.		
		NUM DIELLO NUM	

Figure 4-5. Masimo Rainbow Oximeter SpO2 Optical Emitter and Detector Custom Setup

Table 4-4 is a list of the parameters and their description for the Oximeter SpO2 Optical Emitter and Detector test element.

Parameter	Description
SpO2 Saturation	Sets the degree of oxygen saturation.
Brand	Sets the brand of the pulse oximeter connected to the simulator.
Transmission	Sets the transmission value for the test.
Respiration	Sets the SpO2 respiration for the test.
Ambient Light	Sets the ambient light for the test.
Pulse Amplitude	Sets the pulse amplitude value for the test.
SpMet	Sets the SpMet value for the test. ^[1]
SpCo	Sets the SpCo value for the test. ^[1]
SpHb	Sets the SpHb value for the test. ^[1]
Heart Rate	Sets the heart rate for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
[1] Used for Masimo F	Rainbow SpO2 only.

Table 4-4. Oximeter SpO2 Optical Emitter and Detector Test Custom Parameters

Note

SpO2 saturation, SpMet, SpCo, and SpHb are interrelated. When you change one value, the other values are automatically changed.

Normal Sinus Rhythm Test

This is a visual test. The Simulator does not make a measurement. Figure 4-6 shows the custom setup window for the normal sinus rhythm simulation test.

General setup Apply ProSim Model ProSim 8	when All Expected results	Custom setup		Test Guide Settings ♥ Enable Skip button ♥ Enable NA button
Patient Adult Artifact Lead All Leads	Axis Intermediate	ST Deviation 0 Artifact Size 100	v mV v ≈	
Amplitude	Duration 🗌 Indefinite	15 s		
Select the ProSim Model and r	elated settings for the Normal Sinu	us Rhythm Test. Defau	t ProSim Model is as selecte	d in Preferences window.

Figure 4-6. Normal Sinus Rhythm Simulation Test Custom Setup

Table 4-5 is a list of the parameters and their description for the Normal Sinus Rhythm test element.

Parameter	Description
Heart Rate	Sets the heart rate to use for the test.
Patient	Sets an Adult or Pediatric type of patient for the test.
Axis	Provides a choice of 3 types of Axis and set ECG axis for Normal Sinus Rhythm.
ST Deviation	Sets the ST deviation for Normal Sinus Rhythm, adult only.
Amplitude	Sets the voltage amplitude of the normal sinus wave for the test.
Artifact Type	Sets the artifact type for the test.
Artifact Size	Sets the artifact size for the test.
Artifact Lead	Sets the lead artifact is on for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
ProSim Model	Sets the model of the Simulator to create test template and perform tests. All features of ProSim 6/8 is available for the ProSim 8 model and limited features are available for ProSim 6 model. For more information see Appendix.
	I he default is as selected in the preferences.

Table 4-5. Normal Sinus Rhythm Test Simulations Test Custom Parameters

Performance Wave Test

This is a visual test. The Simulator does not make a measurement. Figure 4-7 shows the custom setup window for the performance wave test.

🕅 General setup 🕨 Apply when 📶 Expected results 🖾 Custom setup					
Wave Square V Rate 2.0 V Hz Amplitude Duration Indefinite 15 s 1.00 V mV	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button				
Select Wave type and related settings for the Performance Wave Test.					
	gjr				

Figure 4-7. Performance Wave Test Custom Setup

Table 4-6 is a list of the parameters and their description for the performance wave test element.

Parameter	Description
Wave	Sets the type of Waveform to use for the test.
Rate	Sets the rate for different type of Wave for the test.
Amplitude	Sets the voltage amplitude of the performance wave for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.

Table 4-6. Performance Wave Test Custom Parameters

R-Wave and QRS Detection Test (ProSim 8 only)

This is a visual test. The Simulator does not make a measurement. Figure 4-8 shows the custom setup window for the R-wave and QRS detection test.

ProSim Model Width Test Guide Settings ProSim 8 50 wms ✓ Enable Skip button Rate 60 wms BPM Amplitude Duration Indefinite 15 s 1.00 wmV ✓ ✓	🕅 General setup 🗎 Þ Ap	ply when 🕅 📶 Expected results 🖾 Custom setup 🛛	
Rate 60 Market Duration I.00 mV	ProSim Model ProSim 8	Width	Test Guide Settings I Enable Skip button I Enable NA button
Amplitude Duration Indefinite 15 s	Rate 60 💌 BPM		
	Amplitude 1.00 v mV	Duration Indefinite 15 s	
Select Rate, Width, Amplitude and desired duration for the R Wave Detection Test. This test is not supported by the ProSim 6 model.	O Select Rate, Width, Ampli	tude and desired duration for the R Wave Detection Test. This	test is not supported by the ProSim 6 model.

Figure 4-8. R-Wave and QRS Detection Test Custom Setup

Table 4-7 is a list of the parameters and their description for the R-wave and QRS detection test element.

Parameter	Description
Width	Sets the width of each waveform for the test.
Rate	Sets the heart rate for the test.
Amplitude	Sets the voltage amplitude of the waveform for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
ProSim Model	Sets the model of the Simulator to create test template and perform tests. All features of ProSim 6/8 is available for the ProSim 8 model and limited features are available for ProSim 6 model. For more information see Appendix.
	The default is as selected in the preferences.

Table 4-7. R-Wave and QRS Detection Test Custom Parameters

Tall T Wave Rejection Test (ProSim 8 only)

This is a visual test. The Simulator does not make a measurement. Figure 4-9 shows the custom setup window for the tall T wave rejection test.

🕅 General setup 📔 Þ Appl	y when 📶 Expected results 🖾 Custom setup	
ProSim Model ProSim 8 Rate	Width 180 ms T Wave Amplitude	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
80 BPM Amplitude 1.00 v mV	100 🛛 % Duration 🔲 Indefinite 15 s	
Select Rate, Width, T Wave 6 model.	s Amplitude, Amplitude and desired duration for the Tall T Wave Re	ejection Test. This test is not supported by the ProSim

Figure 4-9. Tall T Wave Rejection Test Custom Setup

Table 4-8 is a list of the parameters and their description for the tall T wave rejection test element.

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Parameter	Description
Width	Sets the width of each waveform for the test.
Rate	Sets the heart rate for the test.
Amplitude	Sets the voltage amplitude of the waveform for the test.
T Wave Amplitude	Set the T wave amplitude for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
ProSim Model	Sets the model of the Simulator to create test template and perform tests. All features of ProSim 6/8 is available for the ProSim 8 model and limited features are available for ProSim 6 model. For more information see Appendix.
ProSim Model	perform tests. All features of ProSim 6/8 is available for 8 model and limited features are available for ProSim more information see Appendix. The default is as selected in the preferences.

Table 4-8. Tall T Wave Rejection Test Custom Parameters

Arrhythmia Test

This is a visual test. The Simulator does not make a measurement. Figure 4-10 shows the custom setup window for the arrhythmia test.

Arrhythmia Arrhythmia Type Type Supraventricular Atrial Fibrillation Coarse Atrifact Lead Artifact Type Artifact Size All Leads Off 100 < 2 Amplitude Duration Indefinite 1.00 mW Indefinite	8 💌	 ✓ Enable Skip bu ✓ Enable NA but 	itton ton
Supraventricular Atrial Fibrillation Coarse Artifact Lead Atriat Type Artifact Size All Leads Off 100 % Amplitude Duration Indefinite 15 \$ 1.00 mW Indefinite 15 \$	mia Arrhythmia Type	Туре	
Artifact Lead Artifact Type Artifact Size All Leads Off 100 % Amplitude Duration Indefinite 15 \$ 1.00 mV Indefinite 15 \$	rentricular 💽 Atrial Fibrillation	Coarse V	
All Leads Off 100 % Amplitude Duration Indefinite 15 s 1.00 mV	Lead Artifact Type	Artifact Size	
Amplitude Duration Indefinite 15 s	ids 🔽 Off	✓ 100 ✓ %	
	de Duration 🔲 Indefinite	15 s	

Figure 4-10. Arrhythmia Test Custom Setup

Table 4-9 is a list of the parameters and their description for the arrhythmia test element.

Parameter	Description
Arrhythmia	Sets the category of arrhythmia waveform to use for the test.
Arrhythmia Type	Sets the type of arrhythmia to simulate.
Amplitude	Sets the voltage amplitude to use for the test.
Artifact Type	Sets the type of the Artifact to simulate for the test.
Artifact Size	Sets the size of the Artifact to simulate for the test.
Artifact Lead	Sets the Lead the Artifact is to appear on for the test.
Туре	Sets the type parameter for supraventricular arrhythmia simulations.
Ploy V Tach	Sets the type of poly vtach waveforms when this type of arrhythmia is selected
Mono v Tach	Sets the BPM when Mono VTach Rate is set for the test.
Atrial Width, Amplitude, Polarity	Sets the atrial parameters for some TV Paced arrhythmia simulations.
Ventricular Width, Amplitude, Polarity	Sets the ventricular parameters for some TV Paced arrhythmia simulations.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
ProSim Model	Sets the model of the Simulator to create test template and perform tests. All features of ProSim 6/8 is available for the ProSim 8 model and limited features are available for ProSim 6 model. For more information see Appendix. The default is as selected in the preferences.

Table 4-9. Arrhythmia Test Custom Parameters

Note

The ProSim 6 will not support the ACLS arrhythmia.

IBP Dynamic Simulation Test

This is a visual test. The Simulator does not make a measurement. Figure 4-11 shows the custom setup window for the IBP dynamic simulation test.

² Channels	~	Pressure Measure Ui	nit 🗸	Duratio	n 📃 Ind	efinite 60	S	T	est Guide Settings	
Channel 1	Astavial		Chann	el 2	Adapted			[Enable Skip Dutton	
Artifact	Off	∞ %	Artifa	ict	Off	~ %				
Systolic Pressur	• [120 mmHg	Syste	olic Press		120 mr	nHg			
Diastolic Pressu	re	80 mmHg	Diast	olic Press		80 mr	nHg			
oct IPD Chappele	and related o	attings for the IBD Du	namic Simul	ation Tec	t Default Pros	im Model is as	colocted in	Drefer	ence window	=

Figure 4-11. IBP Dynamic Simulation Test Custom Setup

Table 4-10 is a list of the parameters and their description for the IBP dynamic simulation test element.

Parameter	Description
IBP Channels	Sets the IBP Channels to use for the test.
Chamber	Sets the Chamber to use for the test.
Systolic Pressure	Sets the systolic output of the ProSim 6/8 simulation for the test.
Diastolic Pressure	Sets the diastolic output of the ProSim 6/8 simulation for the test.
Artifact	Sets the Artifact to use for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
Pressure Measure Unit	Sets the pressure units to mmHg or kPa for the test. The default is what is set in preferences.

Table 4-10. IBP Dynamic Simulation Test Custom Parameters

IBP Static Pressure Test

This is a visual test. The Simulator does not make a measurement. Figure 4-12 shows the custom setup window for the IBP static pressure test.



Figure 4-12. IBP Static Pressure Test Custom Setup

Table 4-11 is a list of the parameters and their description for the IBP static pressure test element.

Parameter	Description
IBP Channels	Sets the IBP Channels to use for the test.
Pressure	Sets the static blood pressure output which enables the simulator to measure static pressure in mmHg.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
Pressure Measure Unit	Sets the pressure units to mmHg or kPa for the test. The default is what is set in preferences.

Table 4-11. IBP Static Pressure Test Custom Parameters

IBP Cardiac Catheterization Test (ProSim 8 only)

This is a visual test. The Simulator does not make a measurement. Figure 4-13 shows the custom setup window for the IBP cardiac catheterization test.

Sim Model Sim 8		mmHg	Unit Dura	ltion Indefinite 15 s	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
alve 'alve Aortic	~	 Insert 	O Pullback		
Channel 1 —			Channel 2		
Chamber	Arterial		Chamber	Left Ventricle	
Pressure	120/80	mmHg	Pressure	120/0 💌 mmHg	
ct Valve and r	related setting	as for the IBP Cardi	iac Catheterization	Test. Default ProSim Model is as selected in	Preference window.This test is not

Figure 4-13. IBP Cardiac Catheterization Test Custom Setup

Table 4-12 is a list of the parameters and their description for the IBP cardiac catheterization test element.

Parameter	Description
Valve	Sets aortic, pulmonary, or mitral options and sets Insert or pullback.
Chamber	Sets the chamber to use for the selected valve. The user cannot change the chamber.
Pressure	Sets the pressure to use for the selected valve. The user can change the pressure selection on channel 2 only.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
Pressure Measure Unit	Sets the pressure units to mmHg or kPa for the test. The default is what is set in preferences.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.

Table 4-12 IBP	Cardiac	Catheterization	Test	Custom	Parameters
1 abie 4-12. IDF	Carulac	Califeterization	ICOL	Custom	r ai ai i e lei S

IBP Swan – Ganz Test

This is a visual test. The Simulator does not make a measurement. Figure 4-14 shows the custom setup window for the IBP Swan-Ganz test.



Figure 4-14. IBP Swan-Ganz Test Custom Setup

Table 4-13 is a list of the parameters and their description for the IBP Swan-Ganz test element.

Parameter	Description	
Swan-Ganz Steps	Sets the Swan-Ganz steps to use for the test.	
IBP Channels	Sets the IBP channels to use for the test.	
Chamber	Sets the chamber to use for the Swan – Ganz steps.	
Pressure	Sets the pressure to be used for the Swan – Ganz steps.	
Swan –Ganz –Channel #	On selection of channel, channel number will display in the Swan – Ganz channel frame.	
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.	
Pressure Measure Unit	Sets the pressure units to mmHg or kPa for the test. The default is what is set in preferences.	

Table 4-13. IBP Swan-Ganz Test Custom Parameters

NIBP Dynamic Simulation Test

This is a visual test. The Simulator does not make a measurement. Figure 4-15 shows the custom setup window for the NIBP dynamic simulation test.

🕅 General setup 🕨 > Apply	when 🛛 🎢 Expected results	Custom setup	
ProSim Model ProSim 8 Arrhythmia None Patient Adult Selected Preset 120/80 (90)	Pressure Measure Unit mmHg v Envelop Shift 0 v %	Duration Indefinite 60 s	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Pulse Volume 1.00 Select ProSim Model, Arrhytt	mL hmia, Patient, Selected Preset	And related settings for the NIBP Dynamic Simulation	on Test. Default Pressure unit is as

Figure 4-15. NIBP Dynamic Simulation Test Custom Setup

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Table 4-13 is a list of the parameters and their description for the NIBP dynamic simulation test element.

Parameter	Description
Patient	Sets the type of the patient (adult or neonatal) for the test.
Arrhythmia	Sets heart arrhythmias.
Selected Preset	Systolic and Diastolic pressure is depending on the Selected preset. In "Custom" selection, user can change the Systolic and Diastolic pressure values.
Pulse Volume	Sets the pulse volume to use for the test.
Systolic Pressure	Sets the simulated systolic pressure for the test.
Diastolic Pressure	Sets the simulated diastolic pressure for the test.
Heart Rate	Sets the heart rate for the test.
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
Pressure Measure Unit	Sets the pressure units to mmHg or kPa for the test. The default is what is set in preferences.
Envelope Shift	Sets the envelop shift from -10 % +10 %. Default is zero.

Table 4-14. NIBP Dynamic Simulation Test Custom Parameters

NIBP Leak Test

Figure 4-16 shows the custom setup window for the NIBP leak test.

Image: Test of the second	Duration Indefinite 60 s	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Target Pressure 300 r	nmHg	
3 Select Target Pressure and desired du	iration for the NIBP Leak Test. Default Pressure unit is as se	lected in Preferences window.

Figure 4-16. NIBP Leak Test Custom Setup

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Table 4-15 is a list of the parameters and their description for the NIBP Leak test element.

Parameter	Description		
Target Pressure	Sets target pressure for the test.		
Pressure Measure Unit	Sets the blood pressure units to mmHg or kPa.		
Duration	Sets how long the simulation should last (30 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.		

NIBP Pressure Relief Test

Figure 4-17 shows the custom setup window for the NIBP pressure relief test.

🕅 General setup 🕨 Apply when 📶 Expected results 🖾 Custom setup	
Pressure Measure Unit mmHg	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Target Pressure 300 mmHg	
Select Target Pressure and desired duration for the NIBP Pressure Relief Test. Default Pressure	unit is as selected in Preferences window.
	q

Figure 4-17. NIBP Pressure Relief Test Custom Setup

Table 4-16 is a list of the parameters and their description for the NIBP pressure relief test element.

Table 4-16. NIBP Pressure Relief Test Custom Parameters

Parameter	Description	
Target Pressure	Sets target pressure for the test.	
Pressure Measure Unit	Sets the blood pressure units to mmHg or kPa.	

NIBP Pressure Source Test

Figure 4-18 shows the custom setup window for the NIBP pressure source test.

M General setup 🌔 Apply when 🖾 Custom setup	
Pressure Measure Unit Duration Indefinite 15 s	Test Guide Settings ✓ Enable Skip button ✓ Enable NA button
Target Pressure 300 mmHg	
O Select Target Pressure and desired duration for the NIBP Pressure Source Test. Default Pressure unit is	s as selected in Preferences window.

Figure 4-18. NIBP Pressure Source Test Custom Setup

Table 4-17 is a list of the parameters and their description for the NIBP pressure source test element.

Parameter	Description	
Target Pressure	Sets target pressure for the test.	
Pressure Measure Unit	Sets the blood pressure units to mmHg or kPa.	
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.	

Table 4-17. NIBP	Pressure Sou	urce Test Cu	stom Parameters

NIBP Manometer Test

Figure 4-19 shows the custom setup window for the NIBP manometer test.



Figure 4-19. NIBP Manometer Test Custom Setup

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Table 4-18 is a list of the parameters and their description for the NIBP manometer test element.

Table 4-18. NIBP	Manometer ⁻	Test	Custom	Parameters
------------------	------------------------	------	--------	------------

Parameter	Description
Duration	Sets how long the simulation should last (1 to 300 seconds). Check the indefinite checkbox for longer durations. The user must click Stop in the test guide toolbar to stop the test.
Pressure Measure Unit	Sets the pressure units to mmHg or kPa for the test. The default is what is set in preferences.

How to Change the Plug-In Preferences

The Plug-In preferences contain default settings for the Plug-In. You can set a ProSim model preference and measurement units for the blood pressure functions and tests. When the Plug-In is installed, the model preference is set to ProSim 8 and the pressure units is set to mmHg.

To change one of the Plug-In preferences:

- 1. Click **Tools | Options** on the Ansur main menu to open the preferences window.
- 2. Click the ProSim 6/8 Vital Signs Simulator icon in the left pane of the window to show the window in Figure 4-20.

Preferences	
	ProSim 6/8 Vital Signs Simulator
Ansur preferences	ProSim Settings Model Selection Settings:
ProSim 6/8 Vital Signs Simulator	ProSim Model: ProSim 8
	IBP & NIBP Test:
	Pressure Measure Unit: mmHg
	Select ProSim Model and IBP & NIBP settings you want to use. These settings will be used
	as default in the custom setup of test elements.
	OK Cancel Apply

Figure 4-20. ProSim Preferences Window

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To change the model preference, click the down arrow at the right end of the ProSim Model combo box. Next, click the ProSim model.

To change the pressure units, click the down arrow at the right end of the Pressure Measure Unit combo box. Next click one of the measurement units in the drop-down list.

After you set the preferences, click **OK**.

Note

Ansur must be restarted for the changes to take effect.

How to Manage Multiple Simulator Connections

When more than one Simulator is connected to Ansur, the **Select ProSim** dialog in Figure 4-21 will show in the display when you start a test from the test guide window.

Select ProSim
 ✓ ↔ ProSim 8 SN# 3040002 ○ ↔ ProSim 8 SN# 3040011 ○ ◇ ZigBee SN# 3040002 ○ ◇ ZigBee SN# 2280002 ○ ◇ ZigBee SN# 6546543 ○ ◇ ZigBee SN# 3040011
<u>Connect</u> C <u>a</u> ncel

gjp110.bmp

Figure 4-21. Select ProSim Dialog

The serial numbers of Simulators connected to the PC by cable will show \leftrightarrow next to the name and serial number. All Simulators with a wireless connection show (1)).

- 1. Verify the serial number of the Simulator you want to use for the test and check the checkbox for that serial number in the dialog box.
- 2. Click the **Connect** button to start the test.

All test elements within a template or autosequence will be sent to the same Simulator automatically.

To disconnect a Simulator in a single Ansur session:

1. Click *ℓ* on the test guide toolbar as shown in Figure 4-22.

Test results		
Description	Test passed	Test failed
Atrial Fibrillation Coarse		
关 🕞 🕞 Next 🔲 (💽 Start 🗹 NA 🍨 Sk	ip 🖉 User defined
-		Standards +
		Disconnect instrument
		Customize

gjp111.bmp

Figure 4-22. Simulator Disconnect

2. Click **Disconnect instrument** in the dropdown list.

The next time you click (2), the **Select ProSim** dialog in Figure 4-21 will show in the display.

Chapter 5 ProSim 8 Mini Plug-In

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Introduction

The ProSim[™] 8 Mini Plug-In (the Mini Plug-In) is an Ansur Test Executive extension used to create and manage files for the ProSim[™] 8 Vital Signs Simulator. This Plug-In can also be used to update Simulator firmware. This Mini Plug-In can:

ProSim 6 and 8

• Update Simulator firmware.

ProSim 8 only

- Get, print, and delete test result files from the Simulator.
- Send\Get autosequence files to\from the Simulator.
- Play, create, modify, and delete Simulator autosequence files.
- Create, modify, and restore preset files.
- Send preset files to the Simulator.
- Create and modify R-curve files and send them to the Simulator.

This Mini Plug-In is a feature of the Ansur Test Executive software version 2.9.6 or higher. It is not necessary to install the Ansur Pro-Sim 6/8 Plug-In to use most of the features of this Mini Plug-In. However, to play, create, and modify simulator files from Ansur, you must install the Ansur ProSim 6/8 Plug-In.

How to Connect a PC to the ProSim 8

Note

You must have Ansur Test Executive version 2.9.6 or higher installed on your PC to use this Mini Plug-In.

To use the Mini Plug-In:

1. Connect a USB port on your PC or laptop to the Mini B USB device Port of the Simulator.

Or

For the ProSim 8 only, Plug in an XStick USB dongle to your PC USB port. See Figure 5-1.



Figure 5-1. Laptop to PC Connection

2. Double-click the Ansur icon on your desktop or start it from the programs menu.

How to Open the ProSim 8 Mini Plug-In

To open the Mini Plug-In:

- 1. Open Ansur Test Executive.
- 2. Click Tools | ProSim 8 Mini Plug-In in the Ansur main menu. See Figure 5-2.



Figure 5-2. Start the ProSim 8 Mini Plug-In

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Or

Click on the ProSim 8 Mini Plug-In shortcut on the PC desktop.

Or

Click Start | All Programs | Fluke | ProSim 8 Mini Plug-In.

The Mini Plug-In window in Figure 5-3, shows in the display.

降 ProSim 8 Mini Plug-In	
Test Results Autosequence Presets R-Curve Update Firmware	
Get/Delete Test Results from ProSim 8	
Name the file and click 'Get Results'	
ProSim_Results_01_05_2012_17_06_17 Get Results	<u>D</u> elete
Print Test Results	
Browse for test result file, select the 'Operator ID' and 'Test ID' to print	
Uperator ID Test ID	
Print Title	
Fluke Biomedical	Print

Figure 5-3. ProSim 8 Mini Plug-In Window

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You can do all the Mini Plug-In functions from this window. Click a feature tab along the top of the window to show the controls for that feature.

How to Manage Test Results

The test results created on the ProSim 8 can be downloaded to a PC with the Mini Plug-In. You can also print test results data from the PC.

How to Get Test Results Data

The Get Results feature lets you download test results data from the Simulator to the PC. To download test results:

1. Click the **Test Results** tab along the top of the window. The test results window in Figure 5-4 shows in the display.

🖻 ProSim 8 Mini Plug-In
Test Results Autosequence Presets R-Curve Update Firmware Get/Delete Test Results from ProSin 8 Name the file and click 'Get Results' Delete ProSim_Results_01_05_2012_17_04_35 Get Results Delete Print Test Results Browse for test result file, select the 'Operator ID' and 'Test ID' to print Administrator\My Documents\Ansur\ProSim\ProSim_Results_05_03_2012_13_11_35.csv Operator ID Test ID V ABC1 ABC12 ABC123 QUSR ABC123 ABC123
Print Title Select <u>All</u> Fluke Biomedical Print

gjp125.bmp

Figure 5-4. Test Results Download Window

Note

The filename field is filled in automatically. You can change the filename before you download the data.

2. Click the **Get Results** button to start the download.

The test results file is kept in My Documents\Ansur\ProSim and will have a default name of ProSimResults_Date_Time. You can change this name as needed.

All test results in the Simulator are contained in a single file.

How to Print Test Results

With the test result files stored on a PC, the Mini Plug-In can be used to print results. To print test results:

- 1. Click the **Test Results** tab in the Mini Plug-In.
- 2. Click and navigate to the print results file location. The Operator ID(s) and Test ID(s) contained in the file show in the window.
- 3. Click the checkbox next to an Operator ID. Only one Operator ID can be selected at a time.
- 4. Click the checkbox next to the Test ID names. More than one Test ID can be selected at one time.

Note

You can change the Print Title. Fluke Biomedical is a default title.

5. Click the **Print** button.

Note

The path to the downloaded file shows in the Browse field when you Get results. You can print the file without navigating to the location.

Print preview will not show Chinese or Japanese strings if East Asian Languages are not

installed on your computer. To install the East Asian Languages on your computer:

- 1. Open the Regional and Language Options from the PC Control Panel.
- 2. Select Languages tab and check "Install files for East Asian Languages".
- 3. Click Apply.
- 4. When the Insert Disk message shows in the display, insert the operating system CD and click **OK**.

How to Delete Test Results on the Simulator

The Mini Plug-In can delete all the test results files in the Simulator. Click the **Delete** button.

How to Manage and Create Autosequences

The Autosequences used in the Simulator can be downloaded and uploaded between the Simulator and PC with the Mini Plug-In. Click the **Autosequence** tab to show the window in Figure 5-5.

🖗 ProSim 8 Mini Plug-In	
Test Results Autosequence Presets R-Curve Update Firmware	
Autosequence	<u>Refresh</u> ↔
Monitor Testing* IBP Sequence* FCG Testing* Temperature Sequence*	
Oximeter Testing* Custom AutoSequence 1	
Cardiac Failure*	
Exercise*	
Respiration Sequence* Performance Wave Test*	
* This is a factory Autosequence which cannot be deleted.	
Play <u>C</u> reate <u>M</u> odify <u>G</u> et From <u>D</u> el Custom	D <u>e</u> l All
Send To ProSim	
<u>Repeat Autosequence</u>	
Autosequence File (*.pas)	Send Ta

Figure 5-5. Autosequence Window

gjp048.bmp

The window shows all the autosequences in the Simulator. The first ten autosequences are pre-defined and cannot be changed or deleted from the Simulator. You can open a pre-defined autosequence and change it, then add it to the Simulator as a custom autosequence.

A list of the controls and their explanation is shown in Table 5-1.

Table 5-1. Autosequence Window Controls

Control	Description		
Select All	Sets or clears all the checkboxes in the autosequence list.		
Refresh	Reconnects the Simulator and loads the autosequences.		

Control	Description
Connected Icon (♠<↔ USB / ∎))) wireless)	To disconnect from the Analyzer, right-click on the USB or wireless icon.
Play	Opens the test guide to play the autosequence checked in the autosequence list.
Create	Opens the Ansur Mini Plug-In editor to create a new autosequence.
Modify	Opens the autosequence file for modification.
Get From	Gets the autosequence from the Simulator and loads it into the PC.
Del Custom	Deletes the custom autosequence checked in the list from the Simulator.
Del All	Deletes all the customer autosequences in the Simulator.
Repeat Autosequence	Causes the checked autosequence to repeat in the Simulator.
Send To	Sends the autosequence (*.pas) shown in the Send To ProSim field to the Simulator.

Table 5-1. Autosequence Window Controls (cont.)

How to Play an Autosequence

Each autosequence in the Simulator can be started from a PC through the Mini Plug-In. To start an autosequence:

1. Check the checkbox next to one autosequence name in the autosequence list.

Note

The Play button will be disabled (grey) if more than one autosequence checkbox is enabled.

2. Click the **Play** button.

The Mini Plug-In gets and loads the autosequence data from the Simulator to the PC and opens a test guide window similar to the one shown in Figure 5-6.

№ M	onitor Testing_29_08_2011_17_45_14.	pas			
	Step				
2			1. Click the test. 2. Send	'Start' to begir ing command	n sto O
	😵 Test results				
P	Measurement	Preset Value	Value	High Limit	Low
	Step ECG Simulation Test - Normal Sinus Rhythm Test Respiration Simulation Test Temperature Simulation Test IBP Simulation Test - IBP Dynamic Simulation Test Systolic of channel 1 Diastolic of channel 1 Systolic of channel 2 Diastolic of channel 2 NIBP Test - NIBP Dynamic Simulation Test Systolic Diastolic Heart Rate MAP Sp02 Test	200 BPM 80 brpm 42 °C 200.00 mmHg 150.00 mmHg 45.00 mmHg 25.00 mmHg 200.00 mmHg 150.00 mmHg 200 BPM 166.00 mmHg 100 %			
	<	Ш			>
×	Next 🔘 💽 Start 🔯	NA 🔍 Skip 🥖	Selecter	d standard:	

Figure 5-6. Autosequence Test Guide

gjp108.bmp

Note

The date and time is appended to the filename. See the banner of the test guide in Figure 5-6.

3. Click \bigcirc to start the autosequence.

The test results pane in Figure 5-7 shows at the bottom of the test guide window.



Figure 5-7. Autosequence Test Results First Step Pane

When the duration of the step is done, Ansur starts step 2 automatically. If you want to stop step one and move on to the next step, click the **Next Step** button. When a step is between two other steps, the test results pane shown in Figure 5-8 shows in the display.



gjp112.bmp

gjp109.bmp

Figure 5-8. Autosequence Test Results Middle Step Pane

In addition to a **Next Step** button, a **Previous Step** button allows you to go back and do the previous step. When the last step starts, the test results pane shown in Figure 5-9 shows in the display.

Test results
Step 3/3: Step
00:20
Previous Step
Next O Start NA Skip Skip Start Star

Figure 5-9. Autosequence Test Results Last Step Pane

gjp113.bmp

The last step test results pane has the **Previous Step** button and a **Repeat** button. When you click on the **Repeat** button, Ansur starts the first step of the autosequence. When the duration of the last step expires, Ansur will wait for you to either repeat or stop the autosequence.

Note

Test results values can only be typed in after all the steps of the autosequence are done.

4. Click • to stop the autosequence and open the test results window shown in Figure 5-10.

Monitor Testing_29_08_2011_17_50_31.pas				
👸 Step				
		 1. Click 'Start' to begin the test. 2. Sending commands to Instrument 3. Simulating Autosequence in the 		
Test results				
Description	Value			
Step				
Normal Sinus Rhythm Test				
Heart Rate	60			
Respiration Simulation Test				
Normal	Pass			
Temperature Simulation Test				
Temperature	37			
IBP Dynamic Simulation Test				
Systolic of channel 1	120			
Diastolic of channel 1	80			
Systolic of channel 2	45			
Diastolic of channel 2	35			
NIBP Dynamic Simulation Test				
Systolic	120			
Diastolic	80			
Heart Rate	120			
MAP	93.33			
SpO2 Test				
SpO2	Pass	~		
		<u>k</u>		
	NA 🔍 Skip	Step 3 in progress, please wait		

Figure 5-10. Autosequence Test Results Window

gjp114.bmp

The **OK** button is disabled (grey) until all test results values are filled in.

Click the OK button to open the test summary window similar to the one shown in Figure 5-11.

► M	onitor Testing_29_08_2	011_17_56_28.pa	s			(\mathbf{X}
	Test Summar	у						
1	The test is com Previous to rep	pleted. Press I eat any of the	Next to tests.	create	a test	record,	or	
	😵 Test Results							
	Test element	Status	Value	High limit	Low limit	Unit	Flags	^
	E PSM Step	Test passed						
	🎓 🖁 Normal Sinus Rł	nythm TesTest passed	60			BPM		
	PSMS Respiration Simu	ulation Te Test passed	Pass			brpm		
	Temperature Sir	nulation TTest passed	37			°C		
	🗆 🗄 🚟 IBP Dynamic Sir	nulation TTest passed						
	Systolic of channel	1	120			mmHg		
	Diastolic of channel 1					mmHg		
	Systolic of channel	2	45			mmHg		
	Diastolic of channel 2 25 mmHg							
	Sustalia	olinulation rest passeu	120			mmHa		
	Diastolic		80			mmHa		
	Heart Rate		60			BPM		
	MAP		93.33			mmHg		
	SpO2 Test	Test passed	Pass			%		
	E PSM Step	Test passed						~
×	Next 🔘	Start Start	VA 🔬 SK	ip 🦉 🕇	Selected s	standard: APLETED: I	PASSED	

Figure 5-11. Autosequence Test Summary Window

gjp115.bmp

5. Click 0 to save the results file.

How to Create a New Autosequence

1. Click **Create** to open the window shown in Figure 5-12.



gjp069.bmp

Figure 5-12. Build Autosequence Window

You can change the word step to any name by highlighting the word and then type in the new name.

2. Pull a test element from the explorer window to the step container icon in the autosequence window. Figure 5-13 shows the Normal Sinus Rhythm Test element placed into the step container.



Figure 5-13. Add a Test Element to a Step Container

Note

Once you add a test element to a step, you cannot add a test element of the same group to that step. If you put in an incorrect test element to an autosequence step, first delete it and then pull the correct test element in to the autosequence.

3. Click **Custom Setup** tab to show the window in Figure 5-14.

🕅 Ansur ProSim 8 Mini Plug-In - [A	utosequence]				
Bile Edit View Test Tools Window	w <u>H</u> elp				_ 8 ×
🗟 • 🎒 🔚 🖉 📥 🕨 1	1 - X + 1	For 🛃			FLUKE.
ProSim 6/8 Vital Signs Simulator Step CG Simulation Test Normal Sinue Rhythm Test	E PSH Step	ıs Rhythm Test			
Performance Wave Test R Wave Detection Test	🕅 General setup 🕨 Apply v	when 🖾 Custom setup			
GRS Detection Test	ProSim Model ProSim 8	Heart Rate 60	BPM		Test Guide Settings ✓ Enable Skip button
Respiration Simulation Test	Patient	Axis	ST Deviation		Enable NA button
BP Simulation Test	Adult	Intermediate 💌	0	✓ mV	
	Artifact Lead	Artifact Type	Artifact Size		
B B NBP Test	Air Leaus			4	
Sp02 Test	Amplitude 1.00 v mV	Duration 🔄 Indefinite	15 \$		
Test elements Work order	Select ProSim Model, Patient a	and related settings for the Norm	al Sinus Rhythm Test. Defa	ult ProSim Model is as select	ed in Preference window.
			**** DE	MO ***	8/29/2011

Figure 5-14. Custom Setup for a Test Element

You can set all the parameters for the ECG function of the Simulator through the custom setup window. Refer to the *ProSim* $\frac{7M}{6}/8$ Users Manual for more information on these parameters.

gjp073.bmp

gjp118.bmp

How to Create a New Autosequence from a Stored Autosequence

When the Test Executive was installed, all pre-defined autosequences for the Simulator were installed in the Auto Sequence directory in the ProSim Mini Library. These autosequences can be used to make new autosequences. To create an autosequence from another autosequence:

1. Check the checkbox next to the autosequence you want to start with in the Autosequence window. See Figure 5-15.

👂 ProSim 8 Mini Plug-In	
Test Results Autosequence Presets R-Curve Update Firmware	
Autosequence	<u>Refresh</u> ↔
 Monitor Testing* IBP Sequence* ECG Testing* Temperature Sequence* Oximeter Testing* Cardiac Failure* Arrhythmia Sequence* Exercise* Respiration Sequence* Performance Wave Test* 	
* This is a factory Autosequence which cannot be deleted. Play Create Modify Get From Del Custom Send To ProSim <u>R</u> epeat Autosequence	D <u>e</u> l All
Autosequence File (*.pas)	Send To

Figure 5-15. Autosequence Window

2. Click the **Modify** button.

Note

The Modify button will be disabled (grey) when more than one autosequence is checked.

The name of the checked autosequence is used for the new autosequence but modifies the name with an underline character in front of the first character of the autosequence name. The **File Names** dialog box, similar to the one in Figure 5-16, shows in the display.



Figure 5-16. Autosequence File Name Dialog Box

gjp116.bmp

If you want a different name for the new custom autosequence, type in the name.

3. Click the **Get** button. Ansur gets and loaded the checked autosequence from the Simulator into the PC and then opens the Autosequence window shown in Figure 5-17.



gjp117.bmp

Figure 5-17. Monitor Testing Autosequence Window

Add/remove test elements as needed and change the custom settings

4. Click \blacksquare to save the autosequence.

Note

Autosequence files are kept at \...\Program Files\Fluke\ProSim Test Library\Autosequences.

The save function only stores the file on the PC. Refer to the How to Send Autosequences to the Simulator section to add to the autosequences in the Simulator.

How to Get Autosequences from the Simulator

The Get from... function is used to copy the autosequences in the Simulator to your PC. To get an one or more autosequence(s):

- 1. Click the checkbox next to each autosequence name you want to get from the Simulator. You can get more than one autosequence at a time.
- 2. Click the **Get From...** button. The names of all the checked autosequences are modified with an underline character before the first character of the name. The File Names dialog box shown in Figure 5-18 shows in the display.

File Names	
Name	File Name
Monitor Testing	_Monitor Testing
ECG Testing	_ECG Testing
Oximeter Testing	_Oximeter Testing
Cardiac Failure	_Cardiac Failure
Arrhythmia Sequence	_Arrhythmia Sequence
Exercise	_Exercise
Respiration Sequence	_Respiration Sequence
Performance Wave Test	_Performance Wave Test
IBP Sequence	_IBP Sequence
Temperature Sequence	_Temperature Sequence
	<u>G</u> et <u>C</u> ancel

gjp119.bmp

Figure 5-18. File Names Dialog with All Built-In Autosequences

The example in Figure 5-18 shows all the predefined autosequences. You can leave the name with the underline character or change it. You cannot use the names of the predefined autosequences.

3. Click the **Get** button.

The new autosequence(s) is/are kept at $\...\Program Files\Fluke\ProSim Test Library\Autosequences.$

How to Delete Autosequences from the Simulator

You can remove custom autosequences from the Simulator with the Mini Plug-In. The ten predefined autosequences cannot be deleted from the Simulator. To delete autosequences from the Simulator:

- 1. Click the checkbox next to each custom autosequence name you want to delete.
- 2. Click the **Del Custom** button.

Note

You can click the checkboxes for the ten predefined autosequences and click the delete button without an error message. However, none of the predefined autosequences will be removed from the Simulator.

The **Del All** button will remove all custom autosequences from the Simulator.

How to Send an Autosequence to the Simulator

Custom made autosequences can be uploaded to the Simulator. To upload an autosequence:

- 1. Click and navigate to the directory where the custom autosequence is stored.
- 2. Highlight the autosequence to upload.
- 3. Click Open.
- 4. Click **Send To...** The autosequence file will be transferred to the Simulator and the list of autosequences will be updated to reflect the new autosequence.

How to Manage and Change Presets

The Simulator can have up to fourteen pre-defined patient simulations or presets. Each simulation sets each Simulator function to a pre-defined value. You can create and modify custom preset files with the Mini Plug-In and then upload them to the Simulator. To see the presets in the Simulator, click the **Presets** tab to open the window shown in Figure 5-19.

🕞 ProSim 8 Mini Plug-In	
Test Results Autosequence Presets R-Curve Update Firmware	
Presets Select All Normal* Custom 2* Hypertensive* Custom 3* Hypotensive* Custom 4* Tachycardic* Custom 5* Bradycardic* Custom 6* VFib* Custom 7 Asystole* Custom 1*	<u>Refresh</u> ₩
* This is a factory Preset which cannot be selected and get from the ProSim 8.	Dautau
<u>ureate</u> <u>Modify</u> <u>Lat From</u> Send To ProSim Preset Location Normal Presets File (*.ppr)	
	Send To

gjp050.bmp

Figure 5-19. Presets Window

Note

Custom presets do not have an asterisk after the name.

A list of the controls and their explanation is shown in Table 5-1.

Control	Description
Select All	Sets or clears all the checkboxes in the presets list.
Refresh	Reconnects the Simulator and loads the presets.
Connected Icon (●← USB / ∎))) wireless)	To disconnect from the Analyzer, right-click on the USB or wireless icon.
Create	Opens the Ansur Mini Plug-In editor to create a new preset.
Modify	Opens the preset file for modification.
Get From	Gets the preset from the Simulator and loads it into the PC.
Restore Original	Restores the custom preset to factory preset.
Preset Location	Sets one of the 14 locations that can accept a preset in the Simulator.
Send To	Sends the preset (*.prr) shown in the File Name field to the Simulator.

Table 5-2. Presets Window Controls

How to Create a New Preset

1. Click **Create** to open the window shown in Figure 5-20.

🕅 Ansur ProSim 8 Mini Plug-In - [P	reset]		
Bile Edit View Test Tools Window	w <u>H</u> elp		_ & ×
🗟 • 🗁 🔒 🖊 📥 🕨 🕇	🖺 🗖 🖬 📈 🕂 🕈	for 2	FLUKE.
ProSim 6/8 Vital Signe Simulator Step Eco Simulation Test Normal Sinus Rhythm Test Performance Wave Test Respiration Test Respiration Test Respiration Simulation Test Respiration Simulation Test Performance Wave Test Normal Simulation Test Performance Simulation Test Performance Simulation Test Performance Simulation Test Performance Simulation Test Spo2 Test Volve Respiration Simulation Test Spo2 Test	No test element selected.		
		*** DEMO ***	8/29/2011

Figure 5-20. Open Presets Dialog Box

gjp077.bmp

2. Drag and drop test elements as shown in Figure 5-21.



Figure 5-21. Asystole Preset

gjp078.bmp

Note

Once you add a test element to the preset, you cannot add a test element of the same group. If you put in an incorrect test element in a preset, first delete it and then pull the correct test element in to the preset window.

3. Click the **Custom Setup** tab to show the window in Figure 5-14.

You can set all the parameters for the ECG function of the Simulator through the custom setup window. Refer to the *ProSim*TM 6/8 *Users Manual* for more information on these parameters.

Continue to add more test elements to the preset and set the parameters as necessary.

4. Click \blacksquare to save the preset to the present directory.

See the How to Send Presets to the Simulator section to send the preset to the Simulator.

How to Create a New Preset from a Stored Preset

When the Test Executive was installed, all the pre-defined presets for the Simulator were installed in the presets directory in the ProSim Mini Library. These presets can be used to make new presets. To create a preset from another preset:

1. Click **Modify** to open the window shown in Figure 5-22.



gjp122.bmp

2. Highlight the preset you want to modify and click **Open**.

Note

Once you add a test element to the preset, you cannot add a test element of the same group. If you put in an incorrect test element in a preset, first delete it and then pull the correct test element in to the preset window.

3. Click the **Custom Setup** tab to open the window in Figure 5-23.



gjp123.bmp

- Figure 5-23. Custom Setup for a Test Element
- 4. Add, remove, or change test elements as necessary.
- 5. Click File | Save As... to save the preset.
- 6. Use the **Send To...** feature to send the modified preset to the Simulator.

How to Get Presets from the Simulator

The **Get From...** function of the presets is used to get the presets in the Simulator to your PC. To get presets:

- 1. Click the checkbox next to each custom preset name you want to get into the PC.
- 2. Click the **Get from...** button and the **File Names** dialog box in Figure 5-24 shows in the display.



gjp120.bmp

- 3. Type in a name for the new preset or keep the name Ansur created.
- 4. Click **Get** to store the preset in the PC.

The presets are kept at \...\Program Files\Fluke\ProSim Test Library\Presets

How to Send Presets to the Simulator

Custom made presets can be sent to the Simulator. To send a preset:

- 1. Click the down arrow at the right end of the **Preset Location** combo box and highlight one of the fourteen locations you want to replace with the custom preset.
- 2. Click .
- 3. Highlight the preset file name.
- 4. Click **Send To.**.. The preset file will be transferred to the Simulator and the list of presets will be updated reflect the new preset. The asterisk is removed from the file name.

How to Restore a Preset

After a preset has been changed, it can be restored to its original settings through the Mini Plug-In. To restore a preset to its original settings:

1. Click the checkbox to the left of the preset you want to restore. You can check more than one preset.

Note

Presets with "*" after their name are already in their original state. The checkbox for these presets will not change when you click on it.

gjp052.bmp

2. Click the **Restore Original** button.

To restore all the presets to their original settings, click the **Select All** checkbox and then click the **Restore Original** button.

How to Manage and Create R-Curves

R-curves are used to help define the characteristics of a pulse oximeter. You can use the Mini Plug-In to create new R-curves and upload them to the Simulator. Click the R-curve tab to show the window in Figure 5-25.

🖟 ProSim 8 Mini Plug-In
Test Results Autosequence Presets R-Curve Update Firmware
R-Curve Click 'Create' to create new or modify existing R-Curve
Send To ProSim R-Curve File (*.prv) Send To
Delete R-Curves Click 'Delete' to delete all custom R-Curves on ProSim 8

Figure 5-25. R-Curve Window

How to Upload an R-Curve

When you only need to upload an R-curve that already exists, click at the right end of the R-curve name field. Navigate to the location of the R-curve to upload and highlight the file name. Click the **Send To.**. button to send the file to the Simulator

How to Create an R-Curve

To help create R-curves, an SpO2 R-Curve Wizard is included with the Mini Plug-In. To remove all custom R-Curves from the ProSim 8, click the **Delete** button. Click the **Create** button to show the SpO2 R-Curve window in Figure 5-26.

🕅 SpO2 R-Curve		
This wizard will guide you through the process of creating a new R-Curve for your SpO2 accessory. This will allow you to better test a new type of monitor which does not have support build in. 1. Plug ProSim 8 into PC and turn it on. 2. Attach SpO2 accessory. 3. Put SpO2 accessory. 4. Turn monitor on.	Sp02 R-Curve Settings Start with existing R-Curve? R-Curve Name: Desired Resolution: Minimum Sp02%: Maximum Sp02%:	No V Name! Low V 30 \$
	< <u>B</u> ack	Next > Cancel

Figure 5-26. SpO2 R-Curve Wizard Window

gjp053.bmp

You can use R-curve data that already exists to start a new R-curve or start without data. If the "**Start with existing R-Curve?**" field is set to "No", then no R-curve data will be used. To use R-curve data, click on the down arrow at the right end of the combo box. Highlight the R-curve data you want to start with and the wizard will load the R-curve data.

Table 5-3 is a list of the other fields on the first page of the wizard.

Note

To modify an existing *R*-curve, highlight an existing *R*-curve file from the drop-down list in the **Start with existing** *R***-Curve?** combo box.

Table 5-3. SpO2 Wizard Fields

Field	Description/Use
R-Curve Name	Name of the new R-curve file
Desired Resolution	High, medium, or low resolution
Minimum SpO2%	Minimum SpO2% value between 30 and 100 %
Maximum SpO2%	Maximum SpO2% value between 30 and 100 %

After you fill in the fields on the first page of the wizard, click the **Next** button to open the window in Figure 5-27.

gip054.bmp

Sp02 R-Curve				
Adjust Selected Ratio (using up down arrows) until th Since more than one ratio may result in monitor show	e monitor reads the T ring Target SpO2%, try	arget SpO2% v. v to find an aver	alue. age ratio for e	ach value.
Find Correct Ratio	R-Curve			
	R-Curve Name	Name		
Target Sp02%: 30%	Ratio Table	SpO2	Ratio	
		30		
Selected Batio: 5000		31		
		32		
		33		
Continue Characteristics		34		
< Previous Step Next Step >		35		
0%		36		
		Lon		
				ave
		< <u>B</u> ack S	end To	Cancel

Figure 5-27. SpO2 R-Curve Wizard - Page 2

The wizard steps you through SpO2 % values and inserts the SpO2 ratio for each target value. The ratio table shown in the window has SpO2 percentage values that range from the minimum to maximum percentage values that were input in page one of the wizard. To fill in the SpO2 ratio for the SpO2 % values:

- 1. Set the selected ratio value (0 to 25,500) with the up or down arrow at the right end of the field. The value increases or decrease in 25 unit steps for each click of an arrow.
- 2. Click the **Next Step** button.

The wizard fills in the SpO2 ratio with the value in the selected ratio field. If the resolution on the first page is set to High, then only one SpO2 % value has an SpO2 ratio value. The target SpO2% value is increased by one. If the resolution is set to medium, then the first five SpO2 values in the table are filled in with the selected ratio and the target SpO2 % is incremented by five. If the resolution is set to low, then ten SpO2 % values are filled in with the selected ratio and the target SpO2% is incremented by five. If the resolution is set to low, then ten SpO2 % values are filled in with the selected ratio and the target SpO2% is incremented by ten.

Note

You cannot add or change the *R*-curve name or the SpO2 ratio value directly in the ratio table.

3. Repeat steps 1 and 2 until all SpO2 % values have an SpO2 ratio value. The progress bar below the Previous Step and Next Step buttons show you how much of the ratio table is filled in.

If you fill in a step with the wrong ratio, you can undo a step and enter the correct value. Click the **Previous Step** button to remove the ratio value from the SpO2 % values. Change the selected ratio to the correct ratio value and then click the **Next Step** button.

4. Click on the **Save** button to save the R-curve data.

Note

The saved R-curve files are kept in \..*Program File**Fluke**ProSim Test Library**R-Curve.*

After you make an R-curve file, you upload the file to the Simulator when you click the **Send To...** button.

How to Update Simulator Firmware

New firmware for the Simulator processor, user interface (UI), and SpO2 accessories can be downloaded from the Fluke Biomedical website. Save these files on your PC.

Note

Due to the large file size, you must use the USB connection (not wireless) to update the firmware in the Simulator.

To upload a firmware update to the Simulator:

- 1. Open the Mini Plug-In.
- 2. Click the **Update Firmware** tab to show the window in Figure 5-28.

M ProSim 6/8 Firmwa	are Upload	
Select instrument 🚍 ProSim 6/8 on USB	Please select the firmware data files to be uploaded.	
Select file 🦛	Processor Firmware file	
Prepare instrument 🚴	UI Firmware file Sp02 Accessory Firmware file	
Upload firmware 👳		
	< Back Next > Can	cel

gjp056.bmp

Figure 5-28. Firmware Upload Window

- 3. Click at the right end of the field of the firmware you want to upload. You can upload all three types of firmware, any combination of two files, or just one file
- 4. Click the **Next** button.
- 5. Click the **Upload** button to send the file(s) to the Simulator.

Note

Ansur MLC can also be used to upload firmware to the Simulator.