FLUKE®
Biomedical

Ansur IDA-5

Plug-In Software

Users Manual

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Chapter 1
Introduction

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Introduction

About This Manual

This Users Manual contains information on how to install and use the Ansur IDA-5 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 Ansur IDA-5 Analyzer. The chapters in this manual are:

Chapter 1 “Introduction” provides information on Ansur software and the Plug-In.

Chapter 2 “Get Started” provides information on how to install and configure the Plug-In.

Chapter 3 “IDA-5 Tests” provides step-by-step descriptions on how to perform the basic tasks of the Plug-In.

Chapter 4 “Advanced Features” contains information on creating highly efficient safety test procedures using the Plug-In features.

Chapter 5 “Reference” contains details about Plug-In feature and preferences.

Chapter 6 “IDA-5 Mini Plug-In” provides information on the IDA-5 Mini Plug-In feature.

Ansur Software

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

The software works hand-in-hand with Fluke Biomedical analyzers and simulators. This 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 for many Fluke Biomedical instruments. The Plug-In module is a software interface that supplies test elements to the Ansur Test Executive. This scheme lets you use the same user interface for all analyzers and simulators for which there is an Ansur Plug-In.

When you purchase a new Fluke Biomedical analyzer or simulator, you can add a Plug-In software for that simulator or analyzer to your Ansur software library. Each Plug-In module lets you use only the features necessary to do tests on the Device Under Test (DUT). Fluke Biomedical recommends you update the Ansur Test Executive and Plug-Ins on a regular basis from the Fluke Biomedical web site.

IDA-5 Plug-In

The Plug-In supplies remote access to the IDA-5 Infusion Pump Analyzer.

Note

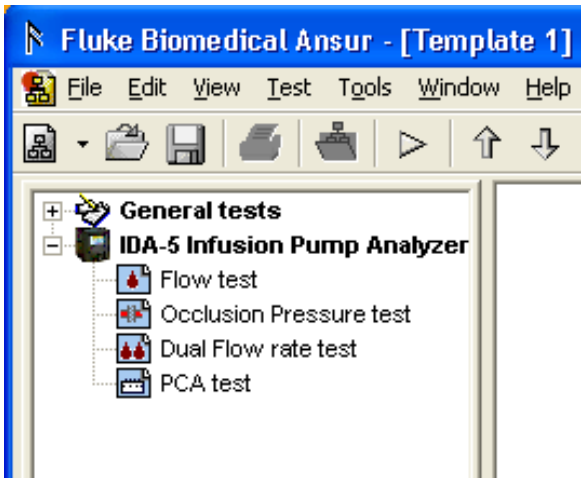
The IDA-5 Infusion Pump Analyzer Users Manual explains the capabilities and use of the Analyzer.

Create and use Ansur test procedures with Plug-In test elements to incorporate the capabilities of an Analyzer into automated testing. You can customize tests to analyze specific performance requirements. There are unique test elements for each of the tests,

and simulations typically done through the Analyzer.

Test Elements

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



hgc078.bmp

Figure 1-1. Infusion Pump Tests in Test Explorer

Table 1-1. IDA-5 Plug-In Infusion Pump Tests

Performance Test	Measurements	Unit	Default High Limit	Default Low Limit
Flow Test	Avg flow	ml/hr	+25%	-25%
	Min Inst flow	ml/hr		-25%
	Max Inst flow	ml/hr	+25%	
	Volume	ml	NA	NA
Occlusion Test	Peak pressure	mmHg		
	Time of Peak	hh:mm:ss		
Dual Flow Test	Primary Flow	ml/hr	+25%	-25%
	Secondary Flow	ml/hr	+25%	-25%
	Primary Volume	ml	NA	
	Secondary Volume	ml	NA	
PCA Test	Basal Flow Rate	ml/hr	+25%	-25%
	Volume	ml	NA	NA
	Average bolus flow rate	ml/hr	NA	NA
	Average bolus duration	hh:mm:ss	NA	NA
	Average bolus volume	ml	NA	NA

The Flow Test measures the flow rate and performance of an infusion pump at a set flow rate.

The Occlusion Pressure Test does a test of the infusion pump occlusion pressure alarm. For patient protection, an alarm will operate when pressure inside the administration set goes above preset levels.

The Dual Flow Rate Test does a test for secondary flow rate, secondary volume, primary flow rate, and primary volume.

The PCA (Patient Control Analgesia) Test is an automated test for the PCA pump control. A technician can set up this unsupervised test. A patient controlled parameter set on the infusion pump controls the Bolus Volume supplied.

Additional References

To learn more about the Analyzer or PC, see:

- Fluke Biomedical *IDA-5 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, *http://www.flukebiomedical.com*

Terms and Abbreviations

Table 1-2 is a list of terms and abbreviations used in this manual.

Table 1-2. Terms and Abbreviations

Term	Description
Ansur	Ansur is a software suite that uses Plug-Ins to do test and inspection procedures with a number of Fluke Biomedical test instruments.
DUT	Device Under Test – the equipment that is connected to the IDA-5 that the tests will measure.
DUT Info	Information used to identify one DUT. DUT serial number, manufacturer, device type and model make up DUT Info. Ansur also adds data fields such as location and status to the DUT info.
IDA-5	Fluke Biomedical Infusion Pump Analyzer.
Field user	The person that does the tests on a DUT with Ansur.
Plug-In	An Ansur Plug-In is a software application that extends Ansur so it can do tests with Fluke Biomedical test instruments.
Test Element	A test element is an Ansur construct that encapsulates test results. A test template is made from other test elements.
Test Guide	A test guide is a PC window shown by Ansur or any of its Plug-Ins when a test element is executed.
Test Template	A test template is an Ansur file that contains a set of test elements that specifies how to test a DUT. A test template can also contain instructions on how to perform service, preventive maintenance, repair and other tasks on a DUT.
Test Record	A test record is an Ansur file contains the results test template tests. The test record can be printed as a test report.

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Get Started

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Introduction

This chapter contains information on how to install the IDA-5 Plug-In and how to use it with the Ansur Test Automation software and the Analyzer.

Note

An Analyzer is not necessary to create test templates and experiment with the functionality available in Ansur and the IDA-5 Plug-In. To do a test connect the Analyzer to the computer.

System Requirements

The recommended minimum requirements for installation are:

- Pentium 2.0 GHz FSB @400 MHz or faster processor
- 512 MB of RAM or higher
- Microsoft Windows (2000/XP/Vista/Windows 7) operating system
- Fluke Biomedical Ansur V2.9.7 or newer
- 50 MB of available hard drive for software
- Hard drive space (from 100 K to several megabytes) for result and template files

Installing the IDA-5 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 (http://www.flukebiomedical.com).

Note

Ansur Test Executive version 2.9.7 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:

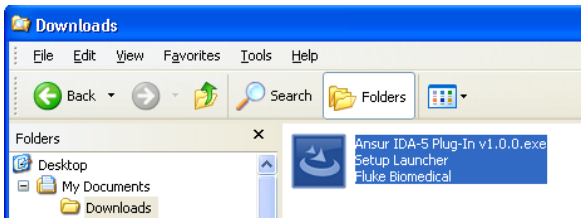
Note

When downloading the Plug-In from the Fluke Biomedical web site, 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 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 or Windows 7, you must first download the file to your local computer, then find the installation file, right click and select "Run as Administrator."

1. Open **Windows Explorer** and browse to the Ansur IDA-5 Plug-In installation program file, usually named **Ansur IDA-5 Plug-In Vn.n.n.exe**, where n.n.n is the Plug-In version number. See Figure 2-1.



hgc079.bmp

Figure 2-1. IDA-5 Plug-In Installation File

2. Double-click the installation program. The installation extracts the Plug-In elements and shows the **Welcome** dialog box in the display.
3. Click **Next** to display the license agreement.
4. Select the checkbox for "**I accept the terms in the license agreement**," and click **Next** to display the default destination folder.
5. Choose program location:
   - Click **Next** to accept the default Ansur destination folder.
   - Click **Change** if Ansur has been installed in a different folder. In this case, the destination folder for the Plug-In is changed so that it resides in the same directory as the Ansur program.

Note

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

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

   When the installation is finished, 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 Start Ansur

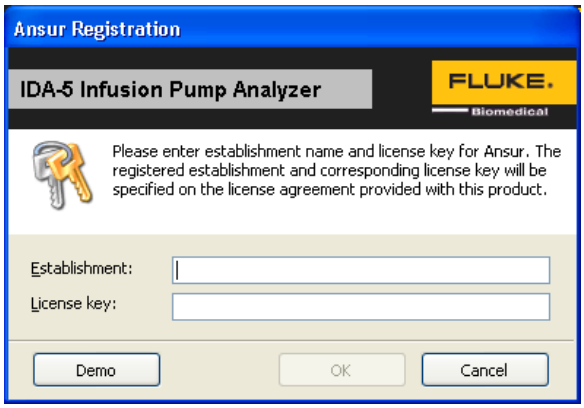
To start Ansur:

1. Click **Start | Programs | Fluke | Ansur** or double-click the Ansur icon on the desktop.

When you use the Plug-In for the first time, you are prompted to type in a software license key. See Figure 2-2. Fluke Biomedical supplied a license key when the Plug-In was purchased.

Note

You can make test templates without a license key in the demonstration mode. Click the Demo button to start the demonstration mode. You can do many of the tasks contained in this Users Manual in the demonstration mode. But, you cannot store or print without the Plug-In license key.



hgc080.bmp

Figure 2-2. Ansur Registration Screen - License Key

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 the demonstration mode.

Note

Because the license key is derived from the establishment name, the name and key must agree with the license information supplied by Fluke Biomedical. This information is case sensitive and space sensitive. If the establishment name was typed in before, that name shows in the field when the dialog opens.

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

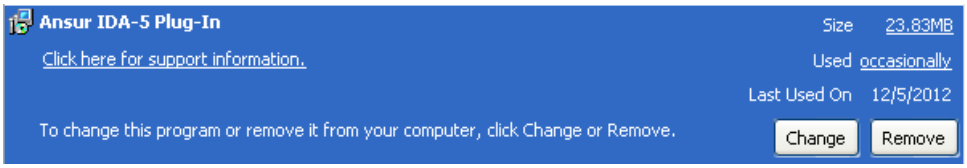
Note

*Click **Cancel** to abort the Plug-In startup.*

How to Un-Install the Plug-In

To uninstall the Plug-In:

1. Click on **Start** | **Control Panel** and double-click **Add or Remove Programs**.
2. Find and click on the **Ansur IDA-5 Plug-In** entry.



hgc081.bmp

Figure 2-3. Remove IDA-5 Plug-In

3. With the entry highlighted, click the **Remove** button as shown in Figure 2-3.
4. When the verify removal dialog box shows in the display, click **Yes**. A dialog box with a progress bar displays while the Plug-In is removed from the computer.

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

Chapter 3
IDA-5 Tests

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Introduction

This chapter contains the operational procedures for the Ansur IDA-5 Plug-In program.

Infusion Pump Test

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

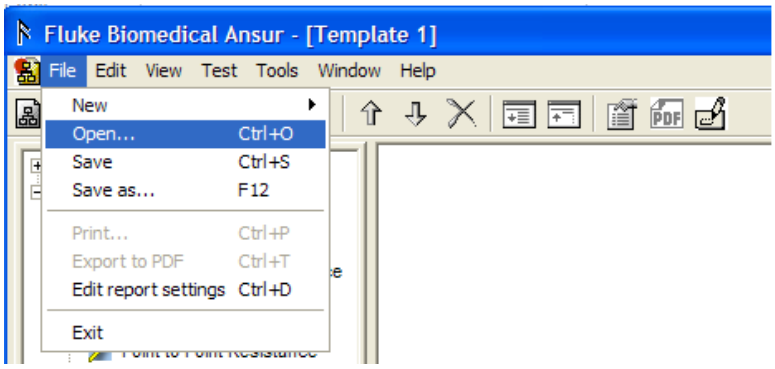
Note

The supplied test templates can be used to make new customized test templates. Load a template, add or change visual inspections and edit tests for the DUT and then use ***Save As*** *to give it different name.*

Open a Test Template

To open a test template:

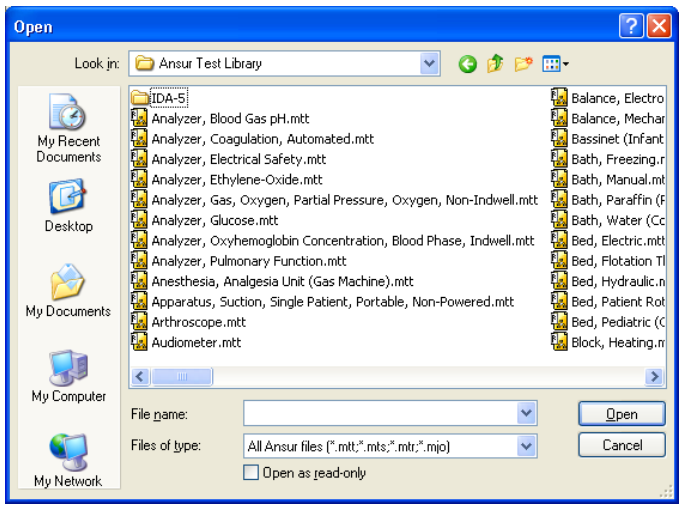
1. Click **File | Open** on the menu bar or click on the Open Template toolbar button ( ) to open the dialog box shown in Figure 3-1.



gvi008.bmp

Figure 3-1. Open Dialog Box

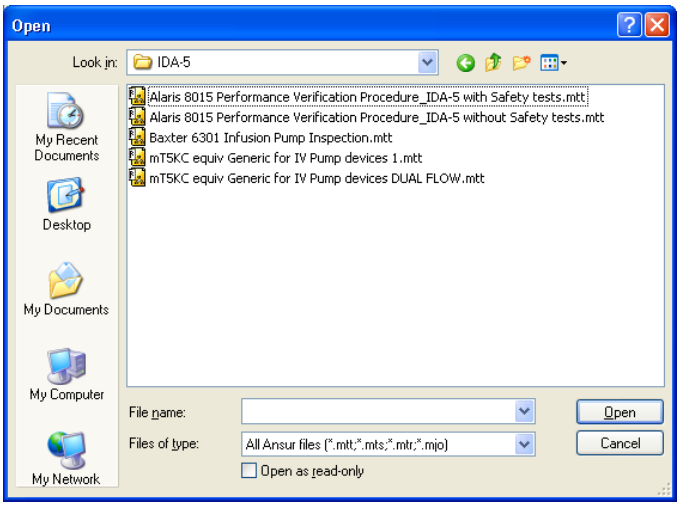
2. Browse to the folder where Ansur was installed and double-click the Ansur Test Library folder. See Figure 3-2. The usual location is C:\Program Files\Fluke but can have a different name.



hgc001.bmp

Figure 3-2. Browse the Ansur Test Library

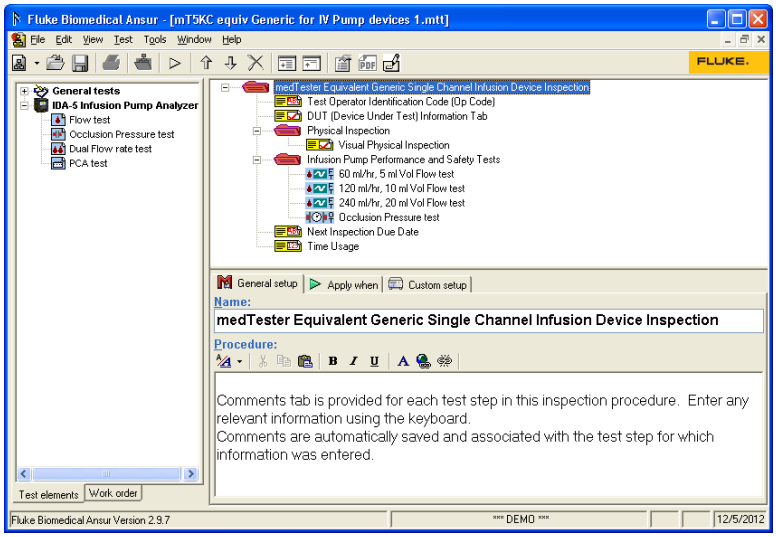
3. Double-click the **IDA-5** folder to open a dialog box as shown in Figure 3-3.



hgc002.bmp

Figure 3-3. Ready-Made Test Template

4. Click a file name and then click the **Open** button, or double-click the file name to open the selected template and show its contents as shown in Figure 3-4.



hgc003.bmp

Figure 3-4. mT5KC Equivalent Generic Test Template

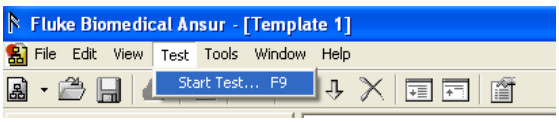
Connect the IDA-5

5. Connect the IDA-5 to one of the USB ports on the computer.

Start the Template

After you open the template, start a test as follows:

6. Click **Test | Start Test** or click the Start Test toolbar button (), or push **F9** on the keyboard as shown in Figure 3-5.



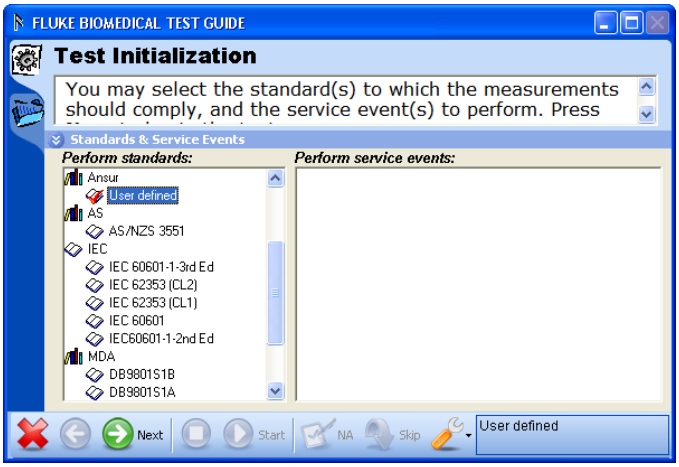
gjb09.bmp

Figure 3-5. Starting a Test Template

Note

When you use Ansur version 2.9.0 or newer, the test initialization window will not show in the display. Ansur will automatically set the standards used in the template and go directly to the first test guide window.

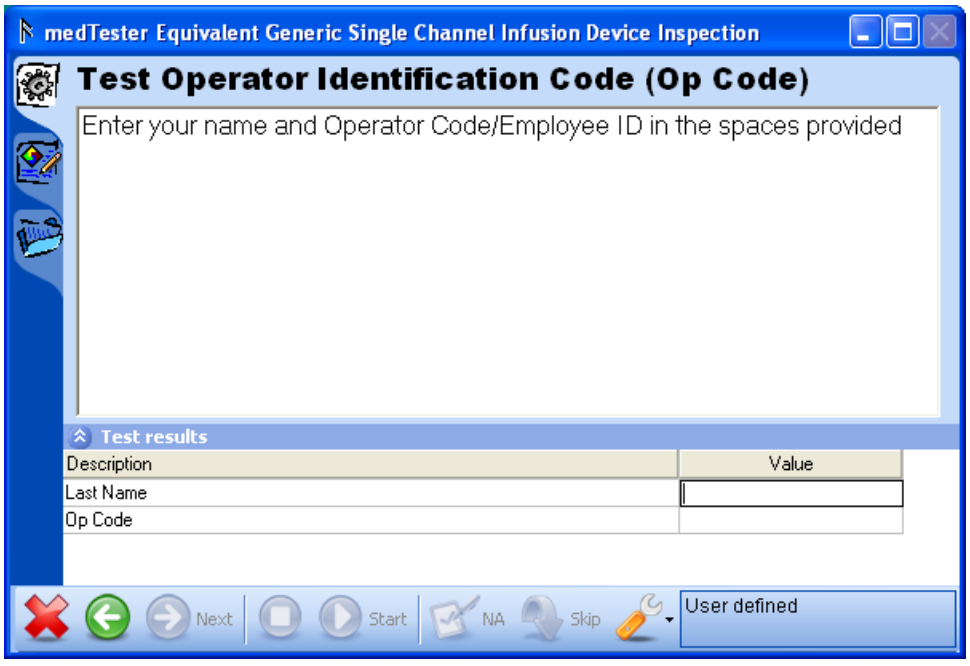
7. If applicable, select the standard from the list in the Test Initialization window shown in Figure 3-6 that agrees with the selected test template. For example, if IEC 60601 test template is opened, then select 601.1 standard and deselect the Ansur User Defined standard that is selected by default.



hgc004.bmp

Figure 3-6. Test Initialization Window

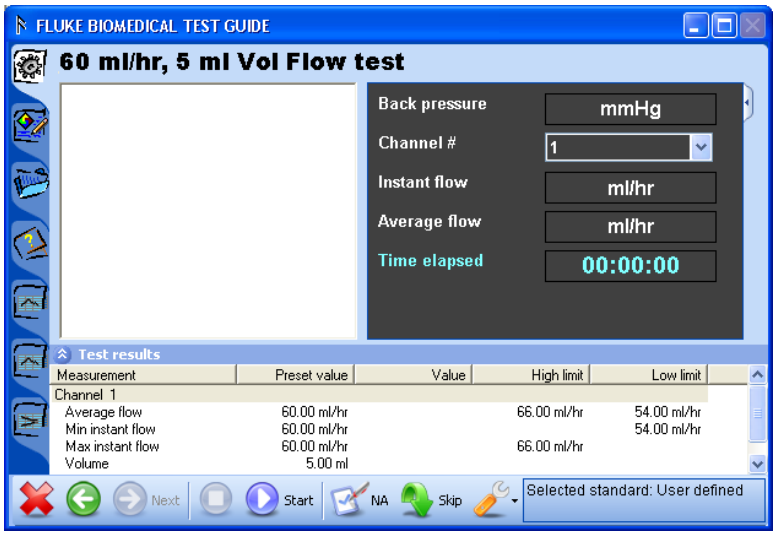
8. Click the **Next** toolbar button ( ) to go to the first Test Guide window shown in Figure 3-7.



gjb75.bmp

Figure 3-7. Test Guide Window

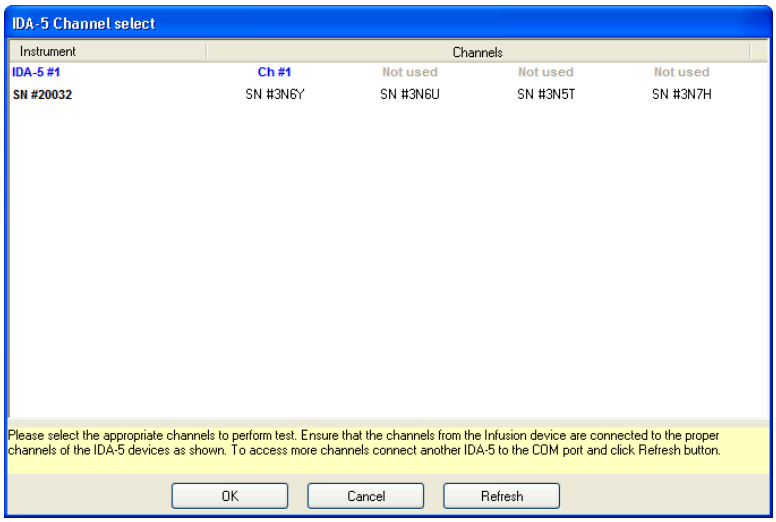
9. Type in the values in the **Test results** pane of the test guide window.
10. Click to open the window in Figure 3-8.



hgc005.bmp

Figure 3-8. Pump Performance and Safety Test Window

11. Click to show the **Channel select** window in Figure 3-9.



hgc006.bmp

Figure 3-9. Channel Select Window

Prime the Analyzer

Before you start a measurement, the IDA-5 Plus must be primed, see Figure 3-10. The Test Guide parameters are set with the same number of channels set in the Custom Setup tab.

hgc007.bmp

Figure 3-10. Prime Window

12. Connect the infusion device to one of the IDA-5 channels.

Note

If the IDA-5 is not connected to the USB port on the computer, Ansur will show the Instrument Not Found window until the Analyzer is sensed.

13. Inject the priming fluid until the Analyzer is primed and the Prime window disappears. See the IDA-5 Analyzer user priming procedures.

Start the Test

14. Click the **Start** button to start the test when the infusion pump is turned on and the flow starts. A progress bar shows as shown in Figure 3-11.

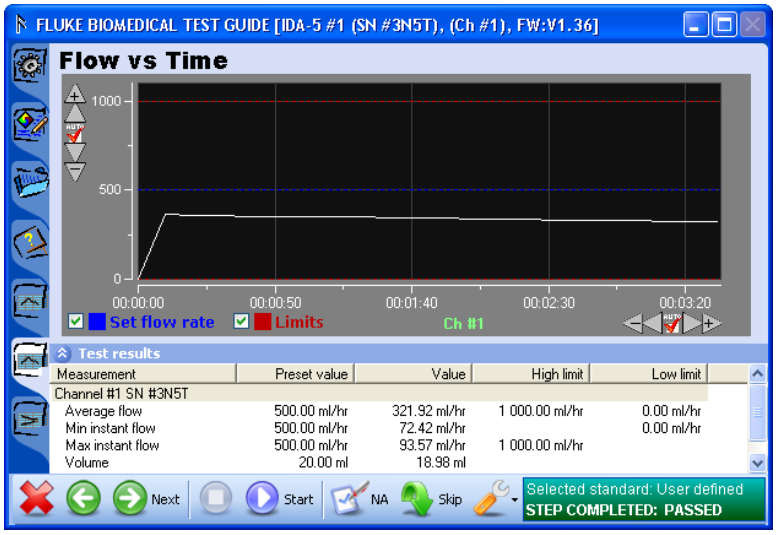
hgc008.bmp

Figure 3-11. Starting a Test

The test starts and measurements are recorded continuously and graphs are plotted.

Complete the Test

When the test is completed, the status bar in the lower right corner of the Test Guide updates. The progress bar is removed, and the **Start** button ( ) is no longer highlighted. An example is shown in Figure 3-12.



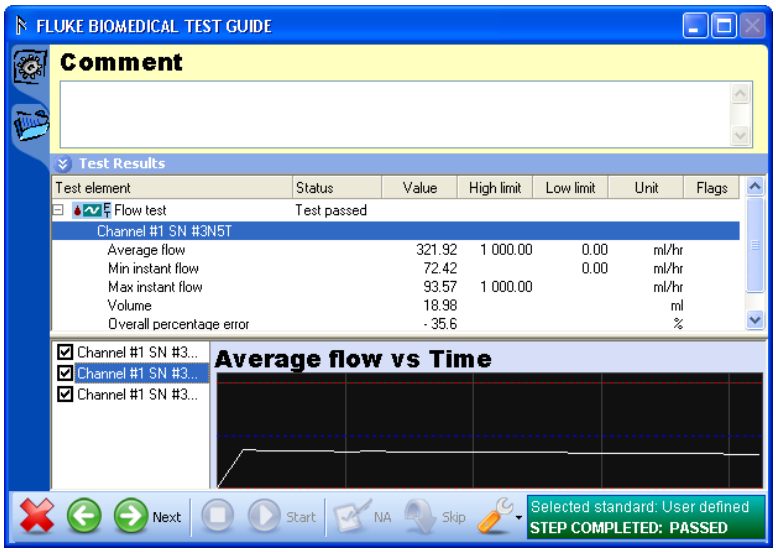
hgc009.bmp

Figure 3-12. Test Completed

15. Click the Next button ( ) or click **F9** on the keyboard to show the Test Summary window in the display. An example is shown in Figure 3-13.

Note

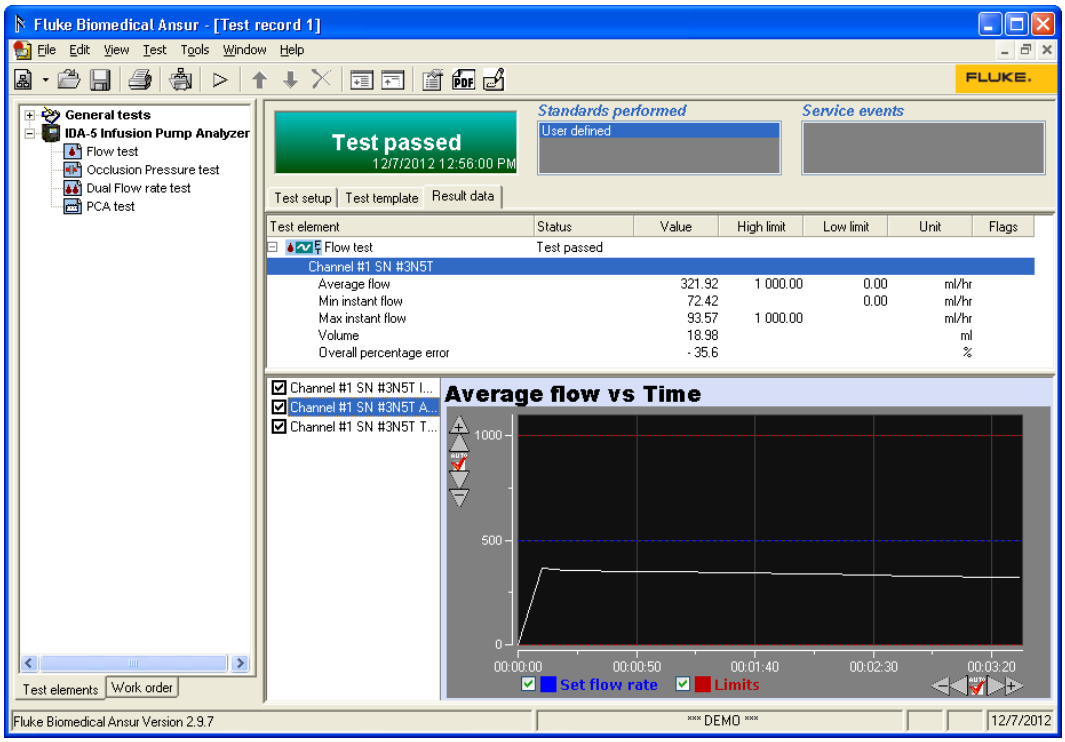
*To do the test again, click the Back button ( ) and click the **Start** button ( ) in Test guide to do the **Flow test** again.*



hgc010.bmp

Figure 3-13. Test Summary

16. Click the Next button ( ) or click **F9** on the keyboard to make a test record. An example of a test record is shown in Figure 3-14.



hgc011.bmp

Figure 3-14. Test Record

Store a Test Record or Template

To save the contents of a test record or template, it must be saved as a file on the computer.

To save as a file:

1. Click **File | Save** on the main menu or click the save icon ( ) in the toolbar or push **CTRL+S** on the keyboard.
2. Browse to the correct location and type in a filename for the test template in the file name field.
3. Click the save icon ( ) on the toolbar or push the **Enter** key.

The file is saved and the Ansur title bar updates with the new name.

Print a Test Report

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

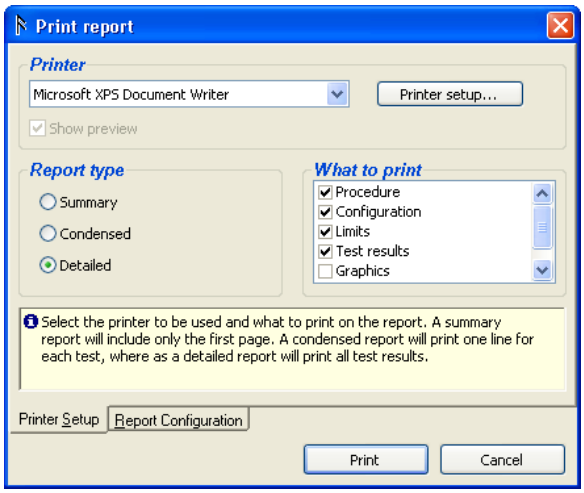
- **Summary** – A report of DUT information, module setup, and the overall status of the test. Summary is used for one-page Pass or Fail reports.
- **Condensed** – A report of the summary report information and one line for each test element. Each line shows if the test passed or failed.
- **Detailed** – A report of the summary page, and all test configuration and result data for each test element.

To print a report:

1. With a test report open, click **File | Print** or click the print icon ( ) on the toolbar to open the **Print report** window shown in Figure 3-16.

Note

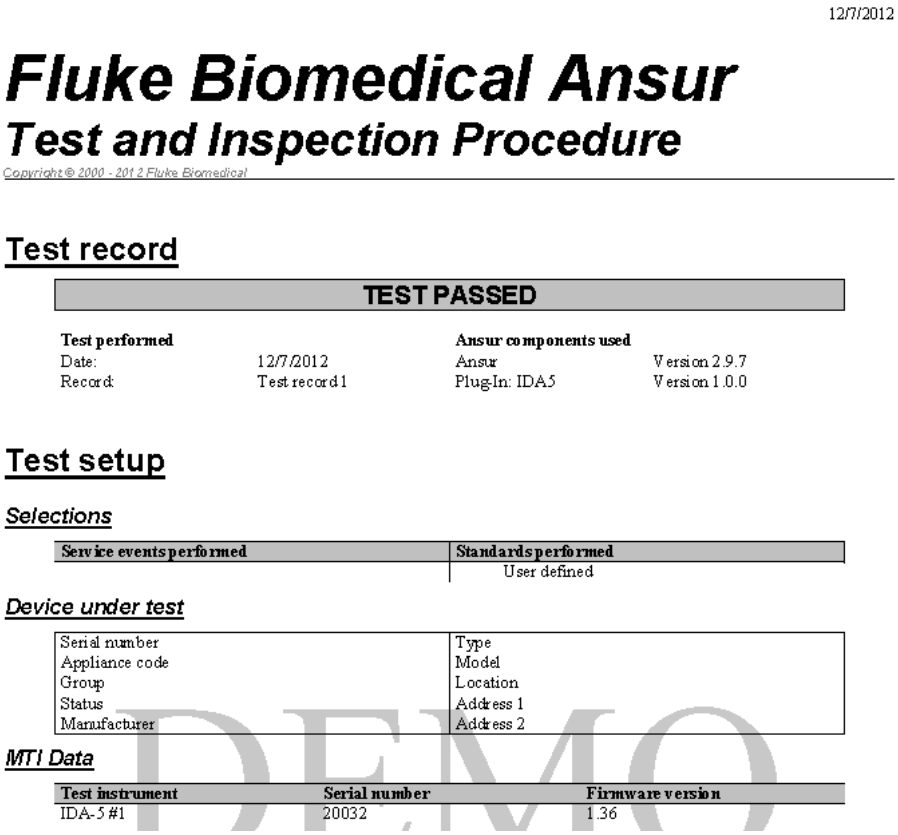
*Click the **Show preview** checkbox to show a check to see the Print preview window before you print the report. The report prints without a preview when the **Show preview** checkbox does not have a check in it.*



hgc012.bmp

Figure 3-15. Print Report Window

2. Click on the option button adjacent to the report type.
3. Click the **Print** button to show the report in the Print preview window. See Figure 3-16.


12/7/2012

Fluke Biomedical Ansur
Test and Inspection Procedure

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Test record

TEST PASSED

Test performed		**Ansur components used**	
Date:	12/7/2012	Ansur	Version 2.9.7
Record:	Test record 1	Plug-In: IDA5	Version 1.0.0

Test setup

Selections

Service events performed	**Standards performed**
	User defined

Device under test

Serial number	Type
Appliance code	Model
Group	Location
Status	Address 1
Manufacturer	Address 2

MTI Data

Test instrument	**Serial number**	**Firmware version**
IDA-5 #1	20032	1.36

DEMO

hgc013.bmp

Figure 3-16. Print Preview Window

4. In Print preview, click the print icon ( ) in the left-hand window border.

IDA-5 Tests

The IDA-5 Infusion Pump analyzer can do a number of tests. Flow, Pressure, Dual Flow, and PCA tests. This section contains instructions on how to do these Analyzer tests through the Plug-In.

Flow Test

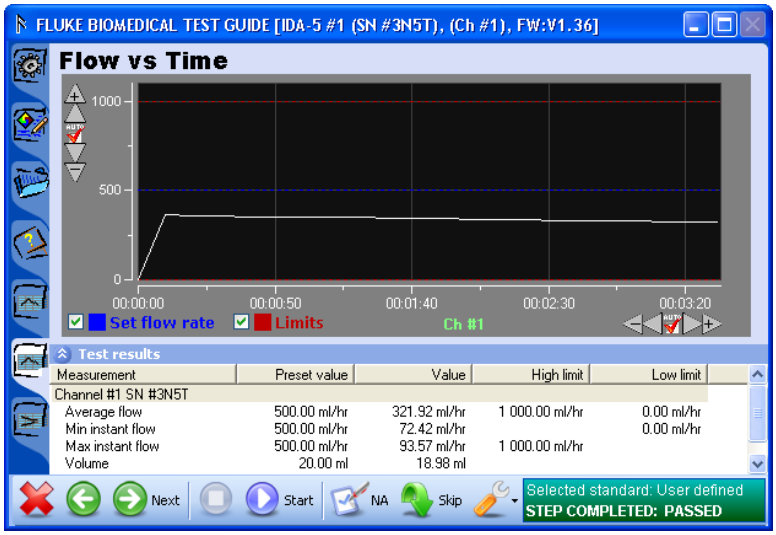
A flow test can be set up to stop after a set time or a set volume. The parameter (time or volume) that is reached first, stops the test. This example demonstrates how to do a flow test that will operate for one hour.

1. Do the steps described in “Infusion Pump Test” section:
   - Load the **Flow test** to the template
   - Connect the Analyzer
   - Start the template
2. Set the infusion pump to supply the flow rate preset in the Flow test. In this example, the preset flow rate is 10 ml/h.

To start the test:

3. Click the start icon ( ) on the Test Guide toolbar or push **F9** on the keyboard.
4. Select the channels in the channel select window and prime the channels you set.
5. Start the infusion pump.

   The measurement starts and Ansur shows instantaneous flow, average flow, and trumpet curve graphs. The graph view for Flow vs. Time is shown in Figure 3-17.



hgc014.bmp

Figure 3-17. Flow Test

When the test is complete:

6. Click the next icon ( ) or click **F9** on the keyboard to show the Test Summary window.
7. Click the next icon ( ) or click **F9** on the keyboard to make a test record.
8. Save the test record as a file on the computer, see “How to Store a Test Template or Record” in the “Infusion Pump Test” section.
9. Print the test. See “Print a Test Report” in the “Infusion Pump Test” section.

Pressure Test

The Occlusion Test Element does a test of the occlusion pressure alarm on an infusion pump. For patient protection, the infusion pump must trip the alarm if the pressure in the administration set is more than the preset levels.

The IDA-5 senses the alarm level and measures the Bolus Volume to keep a safe level. The test parameters and their performance criteria are specified in the **Custom Setup** and the **Expected Results** tabs.

1. Do the steps in the "Infusion Pump Test" section:
   - Load the **Occlusion Pressure** test to the template
   - Select the default pressure unit
   - Connect the Analyzer
   - Start the template

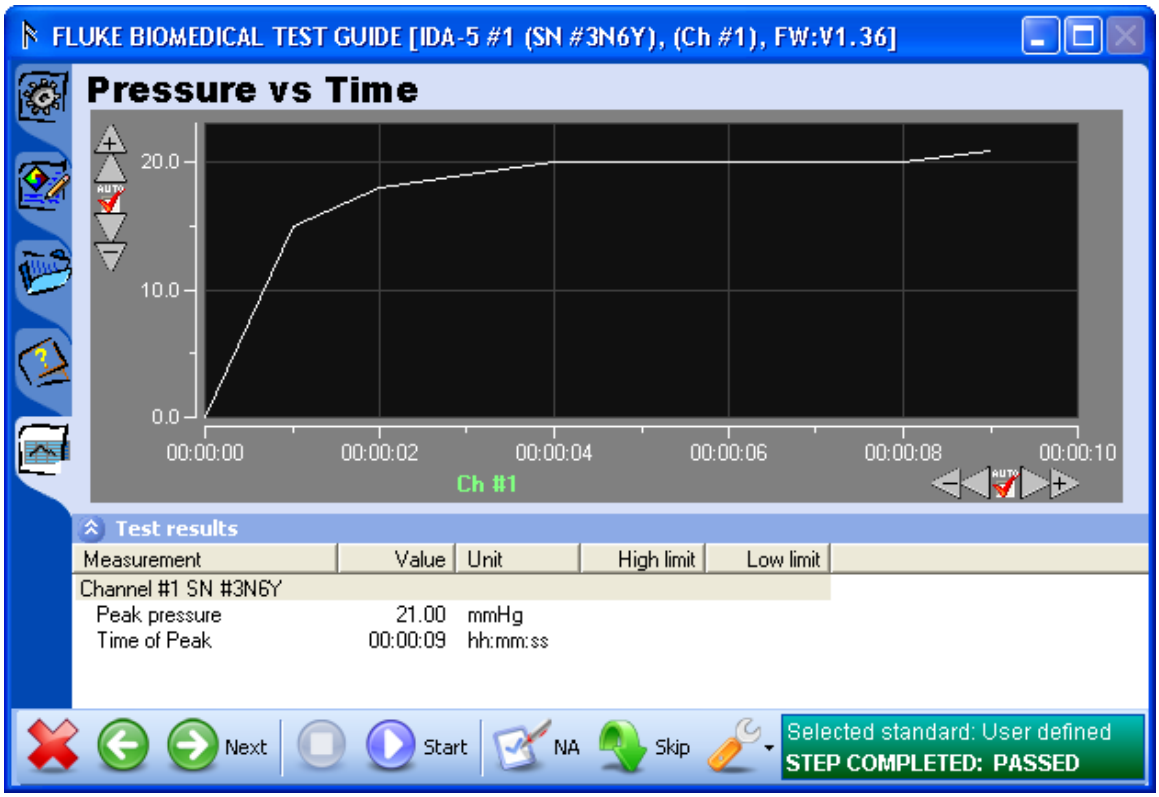
Note

IEC specifies that an occlusion test must be done with different flow rates. If the pump has a programmable occlusion pressure alarm, then IEC recommends you set the alarm parameter to different values. In the Plug-In, you set different alarm values through different occlusion tests in the template. Each test is configured individually. See How to Set Occlusion Test Parameters.

2. Set the infusion pump to supply the flow rate preset in the Occlusion Pressure test. In this example the preset flow rate is 100 ml/h.

To start the test:

3. Click the start icon ( ) on the Test Guide toolbar or push **F9** on the keyboard.
4. Set the channels in the channel select window.
5. Start the infusion pump.



hgc015.bmp

Figure 3-18. Occlusion Test Screen

6. When the test is done, click the next icon ( ) or push **F9** on the keyboard to show the Test Summary window in the display.
7. Click the next icon ( ) or push **F9** on the keyboard to make a test record.
8. Save the test record as a file on the computer. See “Store a Test Template or Record” in the “Infusion Pump Test” section.
9. Print the test. See “Print a Test Report” in the “Infusion Pump Test” section.

Dual Flow Rate Test

This example demonstrates how to do a dual flow rate test, and measures secondary rate, secondary volume, primary rate, and primary volume. The secondary rate changes into primary rate when flow is equal to a preset volume.

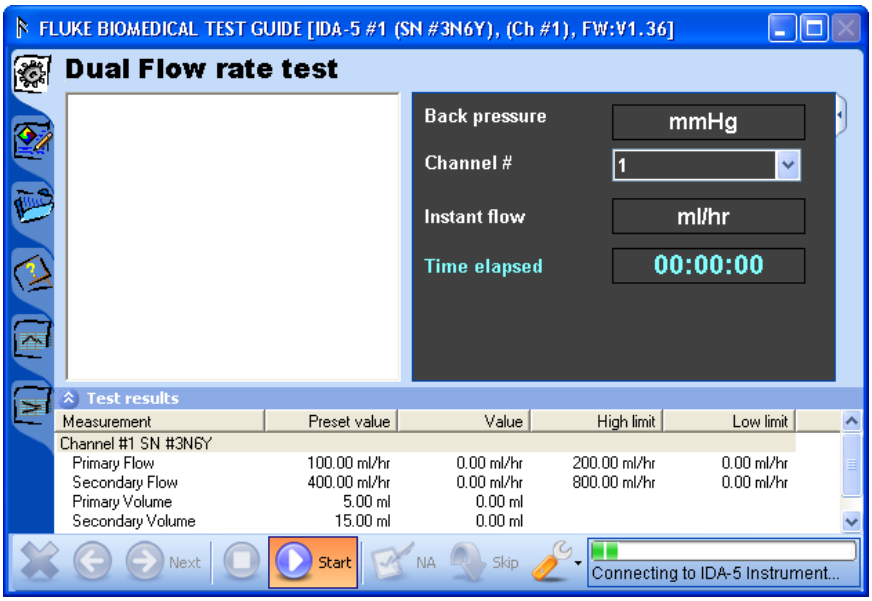
1. Do the steps in the “Infusion Pump Test” section:
   - Load the Dual Flow Rate test to the template
   - Connect the Analyzer
   - Start the template

   The Test Guide parameters will use the number of channels set in the Custom Setup tab.

To start the test:

2. Click the start icon ( ) on the Test Guide toolbar or push **F9** on the keyboard.

   When a connection is made, the test starts and the **Time elapsed** counter starts as shown in Figure 3-19.

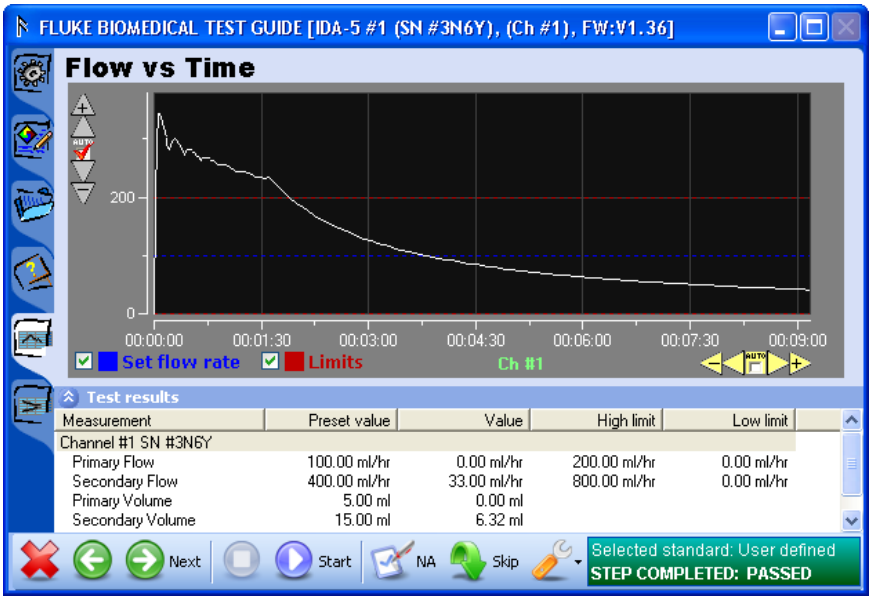


hgc016.bmp

Figure 3-19. Dual Flow Rate Test in Progress

3. Set the channels in the channel select window and prime the channels you set.
4. Start the infusion pump.

   The measurement starts and Ansur makes a plot of the data in a flow or trumpet graph.



hgc017.bmp

Figure 3-20. Dual Flow Rate Test

When the test is completed:

5. Click the next icon (🟢) or push **F9** on the keyboard to show the Test Summary window.
6. Click the next icon (🟢) or push **F9** on the keyboard to make a test record.
7. Save the test record as a file on the computer. See “Store a Test Template or Record” in the “Infusion Pump Test” section.

8. Print the test. See “Print a Test Report” in the “Infusion Pump Test” section.

PCA Test

This example demonstrates how to do a PCA test. The Bolus Volume is supplied to the patient demand as set on the infusion pump. The PCA test can be set up as an unmonitored test.

1. Do the steps in the “Infusion Pump Test” section:
   - Load the PCA test to the template
   - Connect the Analyzer
   - Start the template

The Test Guide parameters will use the number of channels set in the Custom Setup tab.

To start the test:

2. Click the start icon ( ) on the Test Guide toolbar or push **F9** on the keyboard.

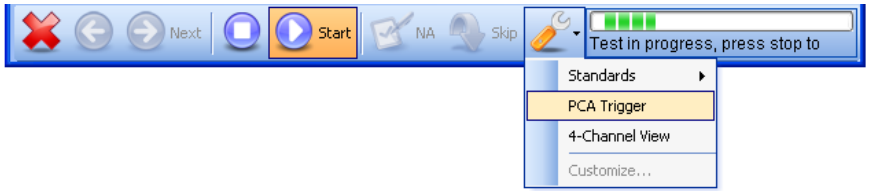
   The Plug-In finds an infusion pump analyzer. Test progress is shown with a progress bar in the lower right corner of the test guide.

3. Set the channels in the channel select window and prime the channels you set.

4. Start the PCA pump.

   The measurement starts and Ansur shows the basal flow graph.

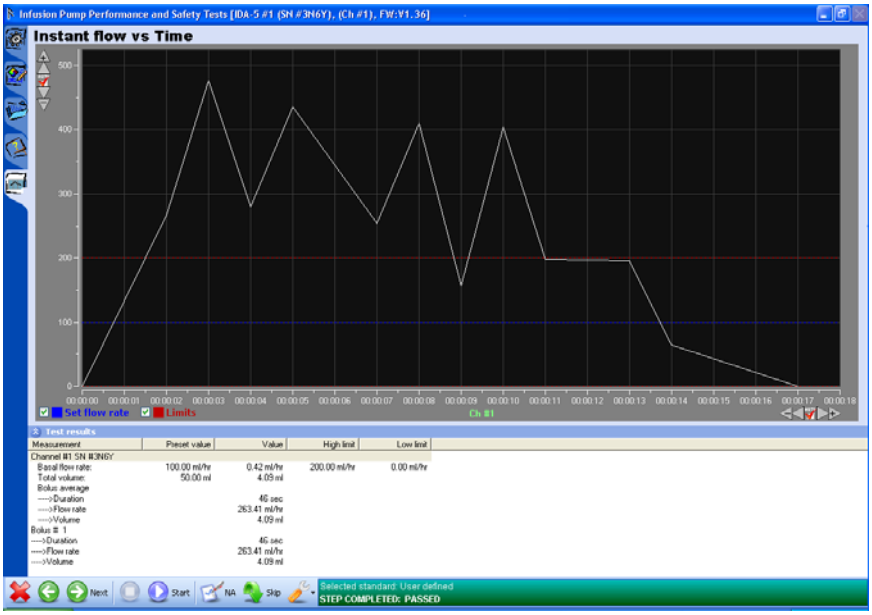
5. If the PCA pump (Device Under Test or DUT) is a manually triggered device, click on the PCA trigger button that is connected to the DUT. If the DUT is an automatically triggered device, click on the **PCA Trigger** in the Tools drop-down list in the Test Guide toolbar. See Figure 3-21.



hgc018.bmp

Figure 3-21. Toolbar PCA Trigger

6. Click to stop the test. The PCA graph of the sensed boluses are shown in Figure 3-22.



hgc019.bmp

Figure 3-22. PCA Test

Note

To do the test again, click the back button ( ) and click the ***Start*** *icon ( ) in Test guide to do the* ***PCA test*** *again.*

When the test is completed:

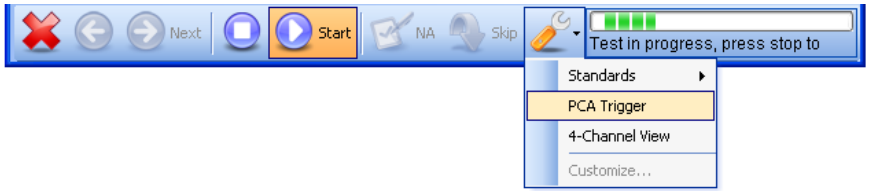
7. Click the **Next** icon ( ) or push **F9** on the keyboard to display the Test Summary window.
8. Click the **Next** icon ( ) or push **F9** on the keyboard to create a test record.
9. Save the test record as a file on the computer, see “Store a Test Template or Record” in the “Infusion Pump Test” section.
10. Print the test. See “Print a Test Report” in the “Infusion Pump Test” section.

Lockout Time Test

A lockout time on an infusion pump prevents a patient from over medicating. The lockout time prevents the pump from injecting medications. The lockout time test makes sure the lockout feature on a pump works correctly. To do a lockout time test:

1. Do the steps in the “Infusion Pump Test” section.
   - Load the PCA test into the template
   - Connect the Analyzer
   - Start the template
2. Click the **Start** icon ( ) on the Test Guide toolbar or push **F9** on the keyboard.
3. The Plug-In finds an infusion pump analyzer. Test progress is shown with a progress bar in the lower right corner of the test guide.
4. Set the channels in the channel select window and prime the channels you set.
5. Start the PCA pump.
6. If the PCA pump (Device Under Test or DUT) is a manually triggered device, click on the PCA trigger button that is connected to the DUT. If the DUT is an

automatically triggered device, click on the **PCA Trigger** in the Tools drop-down list in the Test Guide toolbar. See Figure 3-23.



hgc020.bmp

Figure 3-23. Toolbar PCA Trigger

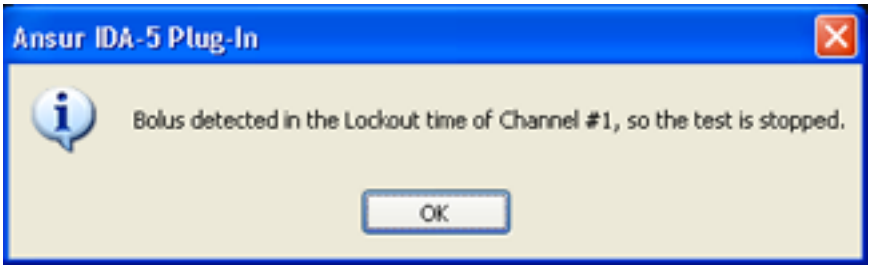
When the lockout time starts in the DUT:

If you use an automatically triggered PCA pump, click the PCA Trigger option in the tools drop-down list.

Or

If you use a manually triggered PCA pump, push the PCA trigger button on the DUT repeatedly.

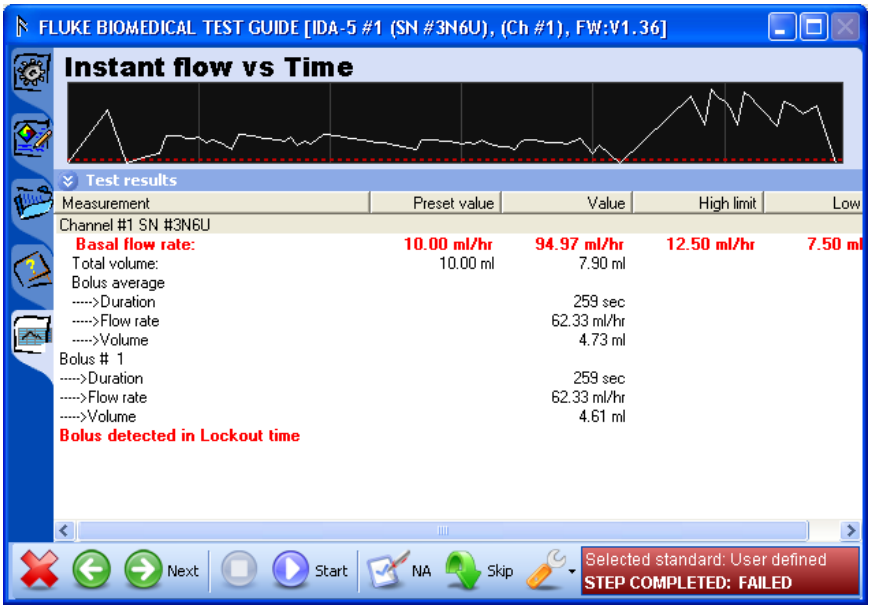
The test fails if the pump injects fluid in the lockout time. The message box in Figure 3-24 shows in the display.



hgc021.bmp

Figure 3-24. Bolus Detected in Lockout Time

Figure 3-25 shows the test guide screen when the lockout time test fails.



hgc022.bmp

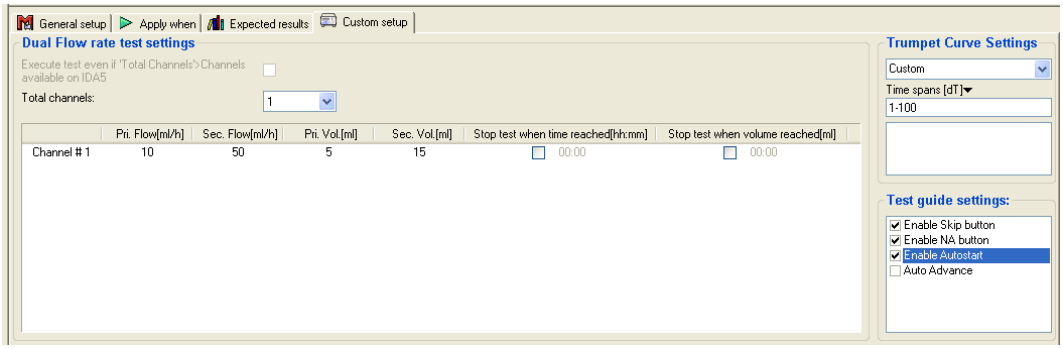
Figure 3-25. Lockout Time Test Failed

Dual Flow Test Parameters

Primary Flow

1. Set the Dual Flow rate test in the template window and click the Custom setup tab.

   The subhead **Pri. flow** is below the **Dual Flow rate test settings**. See Figure 3-26.



hgc023.bmp

Figure 3-26. Dual Flow Test Configuration

2. Click the text box below the heading **Pri. flow** and type in the primary flow rate for the test. The value shows in the text box.

Secondary Flow

1. Set the **Dual Flow rate test settings** in the template window and click the **Custom setup** tab.

   Test element, Custom setup shows in the display. The subhead **Sec. flow** is below **Dual Flow rate test settings** as shown in Figure 3-26.

2. Click the text box below the heading **Sec. flow** and type in the flow rate for the test. The value shows in the text box.

Primary Volume

1. Set the **Dual Flow rate test settings** in the template window and click the **Custom setup** tab.

   The subheading **Pri. Vol.** is below **Dual Flow rate test settings** as shown in Figure 3-26.

2. Click the text box below the heading **Pri. Vol.** and type in the volume for the test. The value shows in the text box.

Secondary Volume

5. Set the **Dual Flow rate test settings** in the template window and click the **Custom setup** tab.

   The subheading **Sec. Vol.** is below **Dual Flow rate test settings** as shown in Figure 3-26.

6. Click the text box below the heading **Sec. Vol.** and type in the volume for the test. The value shows in the text box.

Channel Selection

1. Set the **Dual Flow rate test settings** in the template window and click the **Custom setup** tab.

   The subheading **Total Channels** is below **Dual Flow rate test settings** as shown in Figure 3-26.

2. Click the text box below the heading **Total Channels** and click the drop down arrow ( ) to set a channel. A maximum of twelve channels are available with this Plug-In.

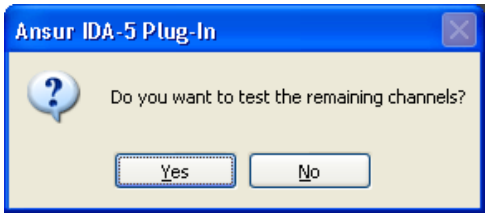
Other Options

1. Choose one of the options below:

   - Click **OK** on the message box to continue the test with the selected channels
   - Click **Cancel** to return to Plug-In Channel select window to select more channels or connect different IDA-5 instrument.
   - Click the **Cancel** button to close the Channel select window.

2. When you connect a new device, click the **Refresh** button to add the new device to the Channel select window.

When the test is done, you can test other channels with the set channels, as shown in Figure 3-27.



hgc024.bmp

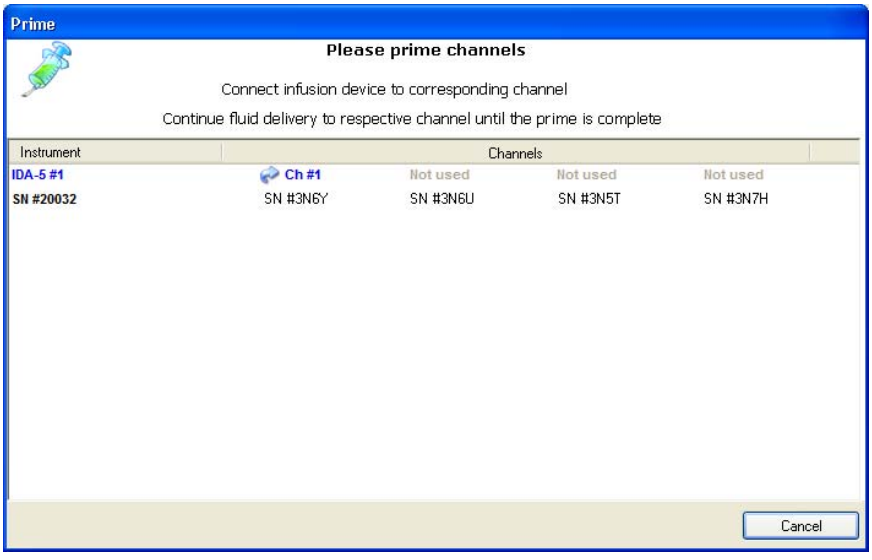
Figure 3-27. Testing Remaining Channels

If the total number of channels selected in the **Custom setup** is 3, select one of the 3 channels from the **Channel select** window.

When a connection is made, the test starts.

Prime the Analyzer

Before you start the measurements, the internal volume of the IDA-5 must be filled with liquid. See Figure 3-28.



hgc025.bmp

Figure 3-28. Prime Window

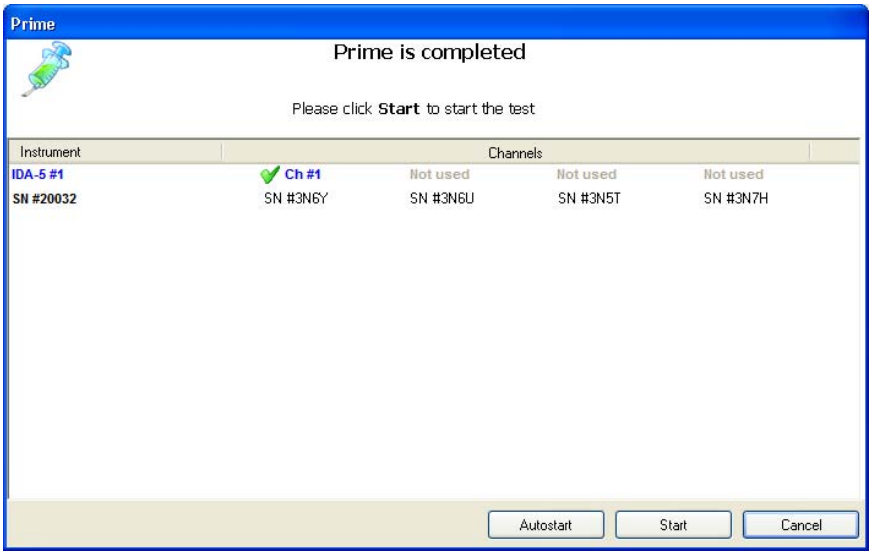
Prime each channel:

- The right sign ( ) shows the channel is primed.
- The ( ) sign shows the channel is priming.
- "Not used" shows that the channel is not set for the test.

Note

If the IDA-5 is not connected to the USB port on the computer, Ansur shows the Instrument Not Found window until the Analyzer is sensed.

1. Continue to inject fluid into each channel until it is primed.
2. Click the **Auotstart** or **Start** button as shown in Figure 3-29 and start the infusion device.



hgc026.bmp

Figure 3-29. Toolbar AutoStart Feature

AutoStart option is shown only if the AutoStart checkbox in the Test Guide settings Custom setup tab has a check in it.

Stop Test when Time Reached

3. Set the **Dual Flow rate test settings** in the template window and click the Custom setup tab.
4. Click the checkbox in the "**Stop test when time reached**" column as shown in Figure 3-26 and set the time to stop.

   A check mark shows that the **Dual flow test** will stop when the time has elapsed.

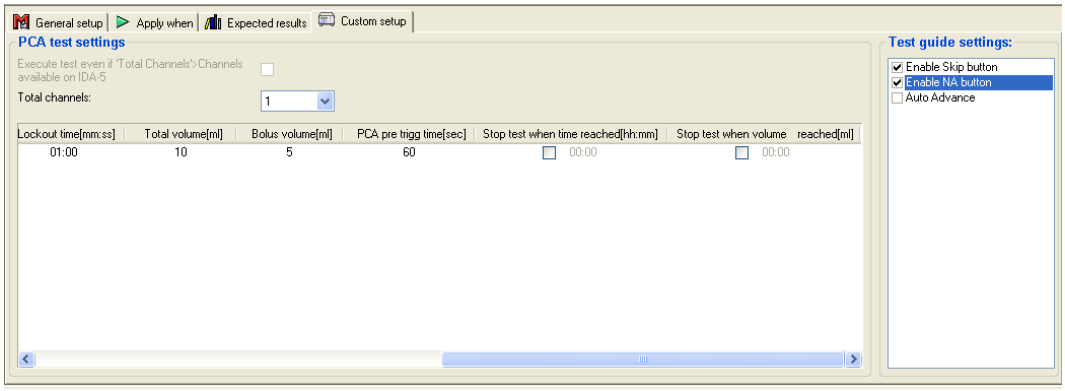
Stop Test when Volume Reached

3. Set the **Dual Flow rate test settings** in the template window and click the Custom setup tab.
4. Click the checkbox in the "**Stop test when volume reached**" column as shown in Figure 3-26 and set the volume.

   A check mark shows that the **Dual flow test** will stop when the volume is injected.

How to Set PCA Test Parameters

The custom setup for the PCA test is shown in Figure 3-30.



hgc027.bmp

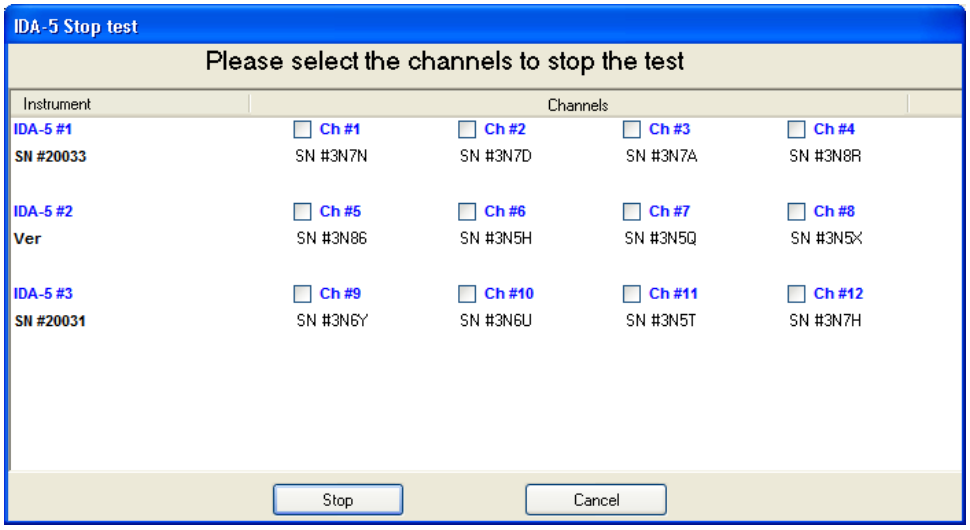
Figure 3-30. Setting Loading Dose in PCA Test

To set PCA Test parameters:

1. Set the total channels from the drop-down list of the **Total Channels** combo box. You can set up to 12 channels.
2. The grid shown in Figure 3-30 shows the selected channel numbers in each row with the default values for **loading dose**, **basal flow rate**, **lockout time**, **total volume**, **bolus volume**, and **PCA pre trigg time**.
3. Click on the related column to change the value with respect to the channel number.
4. Check the checkbox below the **Stop test when time reached** and set the time for the test to stop.
5. Check the checkbox below the **Stop test when volume reached** and set the volume for the test to stop.

Stop the Test

6. Click the stop icon ( ) to stop the test. A selection box shows so the user can set which channels to stop as shown in Figure 3-31.



hgc028.bmp

Figure 3-31. Stopping the Test

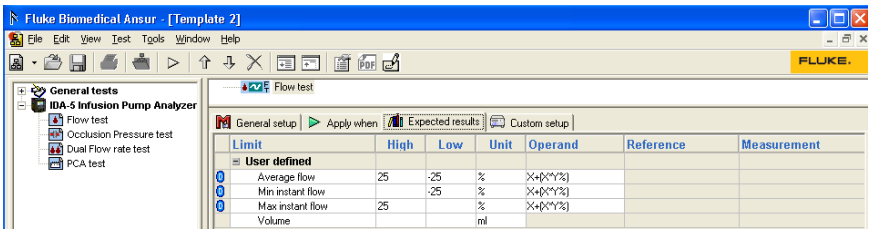
7. Save the test record as a file on the computer, see “Store a Test Template or Record.”
8. Print the test. See “Print a Test Report.”

Set Test Limits

When you make a test template, select which limits to use for the infusion pump performance tests.

1. Set a test in the template window and click the Expected Results tab below the list of test elements.

   The default limits show in the display. See Figure 3-32.



hgc029.bmp

Figure 3-32. Editing Limit Values in the Expected Results Tab

2. Click the High or Low cell to type in the measurement limits.

   The row is highlighted and a cursor shows in the clicked cell.

3. Type in the proper limit value for the measurement.

   The value shows in the cell.

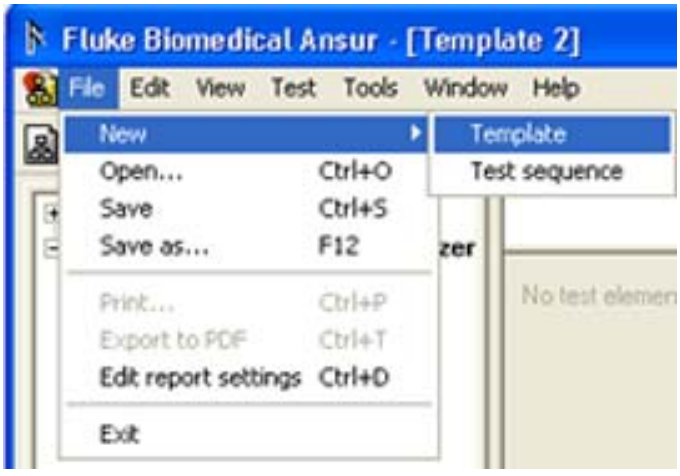
Note

To type in an absolute value as an alternative to a percentage deviation from the set flow rate, click the equation in the Operand column and choose entry Y from the operand menu.

How to Make an IDA-5 Test Template

By default, Ansur opens to a blank test template. If the blank template is closed, the main window shows a gray frame. To make a new test template:

1. Click on **File | New | Template** or click the new template icon (🖻) on the main toolbar. See Figure 3-33.



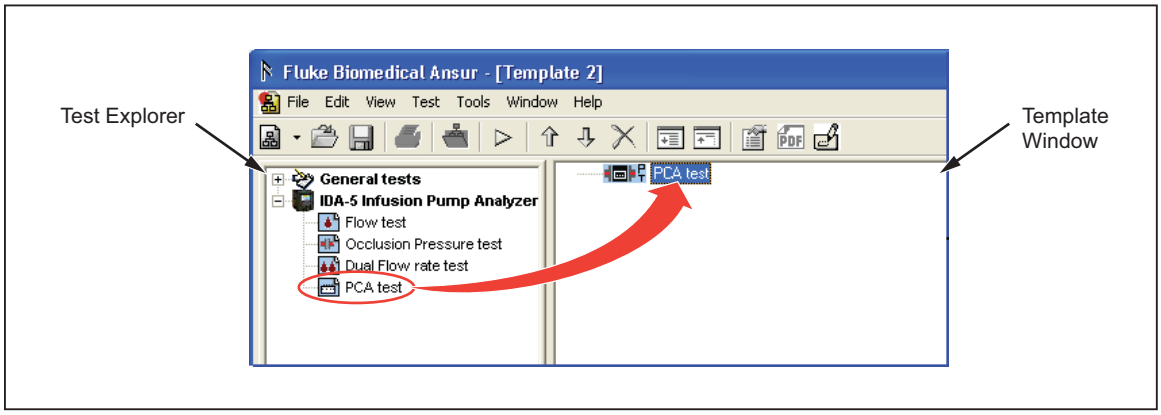
hgc030.bmp

Figure 3-33. Creating a New Test Template

2. In Ansur test explorer, click the plus (⊞) button adjacent to **IDA5 Plus Infusion Pump Analyzer**.
3. Click and hold the left mouse button over the test name.
4. Click and drag the test element into the blank area of the test template as shown in Figure 3-34.

   The test highlights and the mouse pointer changes to a drop cursor.
5. Release the left mouse button.

   A copy of the test appears in the test template window.



hgc031.eps

Figure 3-34. Creating a Test

Chapter 4
Advanced Features

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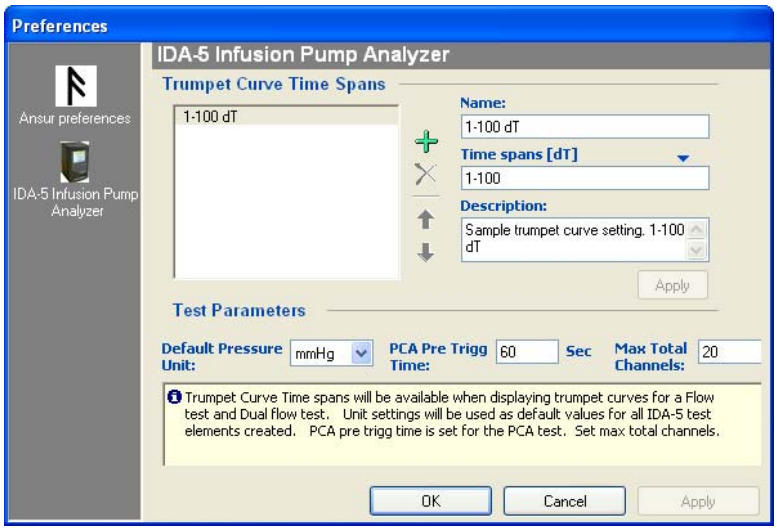
Introduction

This chapter contains instructions on how to use some of the advanced features of the IDA-5 Plug-In. Before you read the instructions in this chapter, you must know the basic tasks in Chapter 3.

How to Change Plug-In Preferences

The Plug-In preferences contain default settings for the Plug-In. You can set pressure units, PCA pre-trigger time, and tumpet curve time span. 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 **IDA-5 Infustion Pump Analyzer** icon to show the preferences as shown in Figure 4-1.



hgc032.bmp

Figure 4-1. Preferences Window

Test Parameters

To change the default pressure units, click the down arrow at the right end of the **Default Pressure Unit** combo box. Then click one of the pressure units in the dropdown list. When you configure tests and view or print test results, the Plug-In uses mmHg as the default pressure unit. The selections are mmHg, PSI, or kPa.

The PCA pre-trigger time is used for lockout time tests on PCA pumps. This is the time before the Analyzer triggers the pump. To change the PCA pre-trigger time, highlight the time value in the **PCA Pre Trigg Time** text box and type in the new value. The default time is 60 seconds.

Each test element has a Total channels custom setup parameter. The default value for total channels is set in Preference window. To change the default value, highlight the value in the **Max Total Channels** box and type in the new value.

Trumpet Curve Time Span

The default Trumpet curve parameter values to be used in the tests are configured in the preferences. The custom name, time span, and description can be configured here and can be used in the custom setups. You can add (+), delete (×), move up (↑), and down (↓) trumpet curve time spans with the applicable icon.

How to Define Trumpet Curves According to IEC 601.2.24

The IEC 601.2.24 standard specifies different trumpet curves to be used for different types of infusion pumps.

This section describes how to define and print a report with a trumpet curve in accordance with IEC 601.2.24 sub-clause 55.102. See Table 4-1.

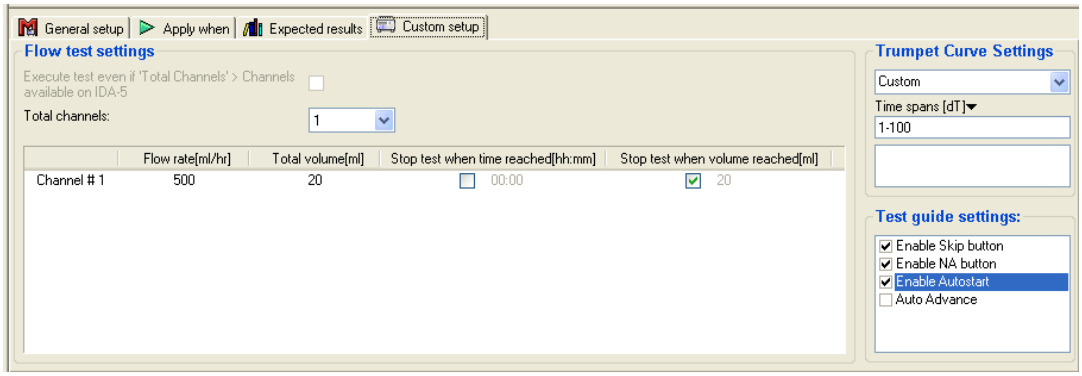
Table 4-1. Trumpet Curve Information

Description	Observation windows [1] [minutes]	IEC 601.2.24 sub clause
Infusion Pump Analyzer	2, 5, 11, 19, and 31	50.102
[1] The trumpet curve must be calculated from the flow data sampled in the second hour of the test period.		

Configure the Test

1. Make a test template and add a flow test. Configure the flow test with the applicable flow rate and set test time to more than two hours.
2. Set the flow test in the template window and click the **Custom setup** tab.

   The trumpet curve is specified in the Trumpet curve parameters as shown in Figure 4-2.



hgc033.bmp

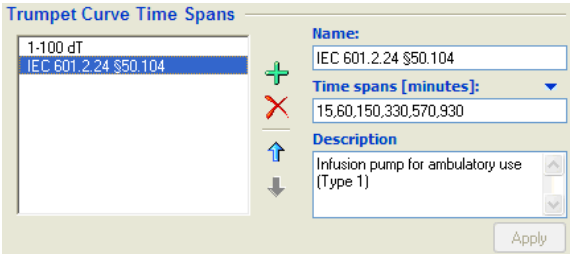
Figure 4-2. Trumpet Curve Settings

3. Click in the drop down box that contains the text and type in a name for the trumpet curve. In the example, the name is IEC 601.2.24 §55.102.

   The name is shown in custom setup.

4. Click the drop down arrow adjacent to the sub heading **Time spans [dT]** and click on **[minutes]** from the unit menu.

   The sub heading updates to read **Time spans [minutes]** as shown in Figure 4-3.



gjb48.bmp

Figure 4-3. Time Spans [Minutes]

5. Click in the **Time spans** text box and type in the time spans (observation windows) for the trumpet curve. In this example the time spans are 15, 60, 150, 330, 570, and 930 as specified in the standard. Each value must be separated by a comma. See Figure 4-3.

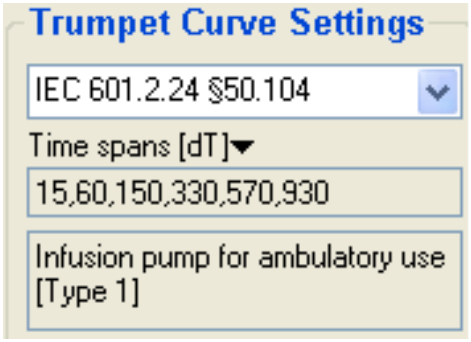
   When the test is started, these time spans are used to calculate the trumpet curve.

   Note

   An invalid time span string displays in red as it is typed, but displays in black when completed.

   An optional comment may be included in the text box below the time spans.

   Correct trumpet curve parameter values show as in Figure 4-4.



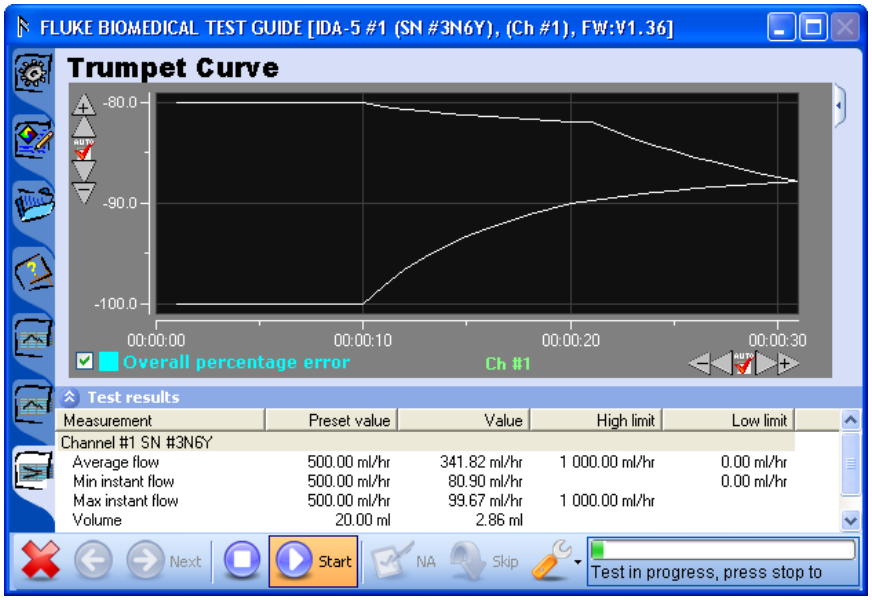
hgc034.bmp

Figure 4-4. Trumpet Curve Settings for IEC 601.2.24 § 50.102

   The trumpet curve is configured.

How to View a Trumpet Curve

Click the Trumpet Curve tab ( ) along the left hand border of the Test Guide to examine the trumpet curve while the test is executing. See Figure 4-5.



hgc035.bmp

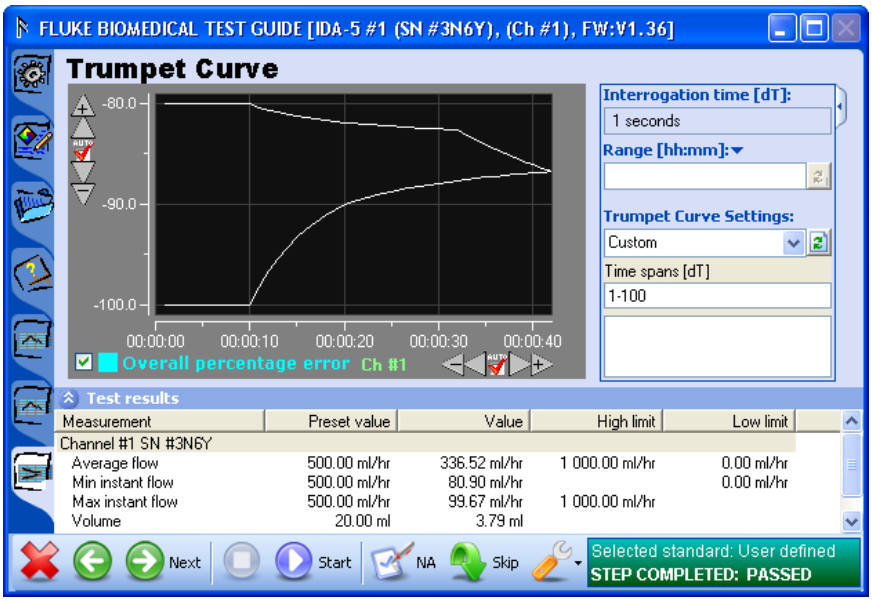
Figure 4-5. Inspecting the Trumpet Curve While Running Ansur

The trumpet curve shown in the Test Guide plots all the measured data in the test period. Not only the second hour as specified in the standard. Change the range to get a trumpet curve of the second hour data.

Set the Range

To set the range of the graph:

1. Click the Details icon (i) found along the right hand side of the graph frame. The trumpet curve parameter values show to the right of the graph. See Figure 4-6.



hgc036.bmp

Figure 4-6. Trumpet Curve Settings in Test Guide

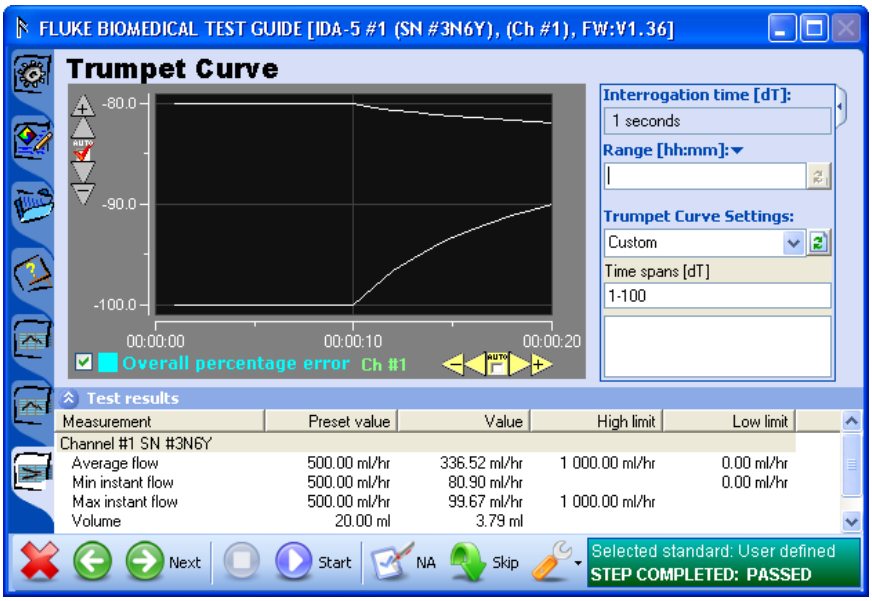
2. Click the Range text box and type in the trumpet curve range. To set the second hour, type in “01:00-02:00”.

Note

An invalid time span string shows in red as it is typed, but displays in black when completed.

3. Click the refresh icon (🔄) adjacent to the range text box to update the curve.

   The trumpet curve is redrawn for the range 00:00:00 – 00:00:20 as shown in Figure 4-7.



hgc037.bmp

Figure 4-7. Redrawn Trumpet Curve

Notes

- *The time or X axis does not change when the range is refreshed. The X axis of the trumpet curve contains the time spans used to generate the curve and not the time for the flow data samples in which the range selection was made.*
- *The range does not have to be configured while the test is executing. All trumpet curve parameter values can be configured while you show the* ***Detailed result*** *of a completed test in the test record window. The trumpet curve is configured as specified by IEC 601.2.24 sub-clause 50.102. Do the test and store the test results. The test report will be in accordance with the IEC standard for Infusion pumps analyzer.*
- *Besides the flow test with a trumpet curve, it is necessary to do other tests to comply with the IEC standard.*

How to Set Default Trumpet Curve Parameters

The Plug-In has features to help make default trumpet curve parameters that can be re-used for all test templates.

In this example, the default trumpet curve is set in accordance with IEC 601.2.24 sub-clause 50.104 as shown in Table 4-2.

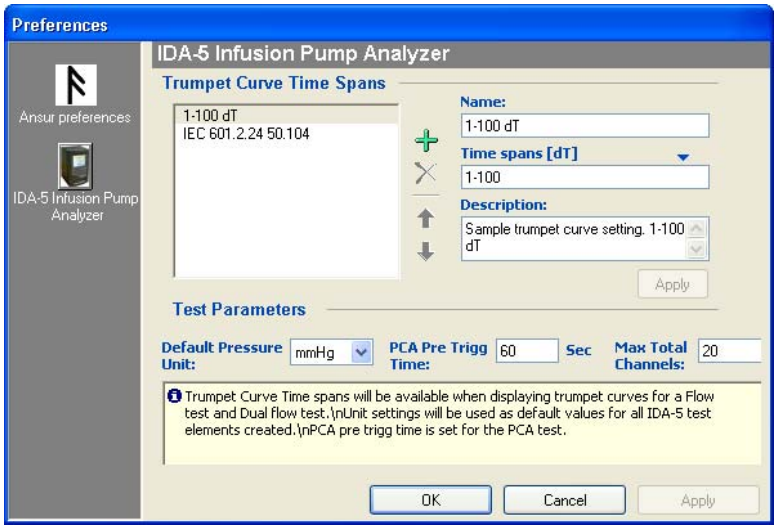
Table 4-2. Trumpet Curve Settings

Description	Observation windows [1] [minutes]	IEC 601.2.24 sub clause
Infusion Pump Analyzer for ambulatory use	15, 60, 150, 330, 570 and 930	50.104
[1] The trumpet curve must be calculated from the end of the stabilization period to the end of the test.		

Open the Plug-In **Preferences** menu:

1. Click **Tools | Options** from the Ansur main menu.
2. Click **IDA-5 Infusion Pump Analyzer**.

   Plug-In preferences window is shown in Figure 4-8.



hgc038.bmp

Figure 4-8. Plug-In Preferences

Add a new trumpet curve setting.

1. Click the add icon (+) adjacent to the list of trumpet curve parameters.

   A name **[New]** is added to the list and the **Name** text box now contains the text **[New]**.

2. Click in the **Name** text box and type in a descriptive name for the trumpet curve. “IEC 601.2.24 §50.104” for example.

   The name in the text box shows while you configure the flow test.

3. Click the drop down arrow adjacent to the sub heading **Time spans [dT]** and click on **[minutes]** from the unit menu.

   The sub heading updates to read **Time spans [minutes].**

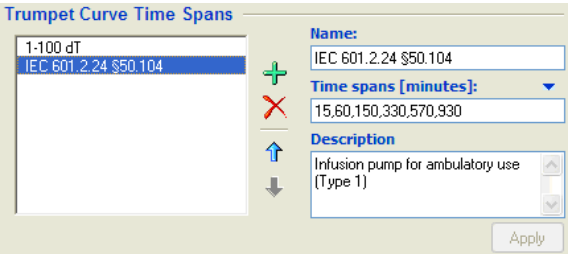
4. Click in the **Time spans [dT]** text box and type in the time spans, observation windows, for the trumpet curve. In this example, “15, 60, 150, 330, 570, 930” as defined in the standard. The numbers must be separated by a comma.

   Time spans show as you type them in. When the test is started, these time spans are used to calculate the trumpet curve.

   An optional comment can be included in the text box below the time spans.

5. Click the **Apply** button.

   Correct trumpet curve parameter values are shown in Figure 4-9.



gjb48.bmp

Figure 4-9. Trumpet Curve Settings for IEC 601.2.24 § 50.102

Make a flow test with the default trumpet curve.

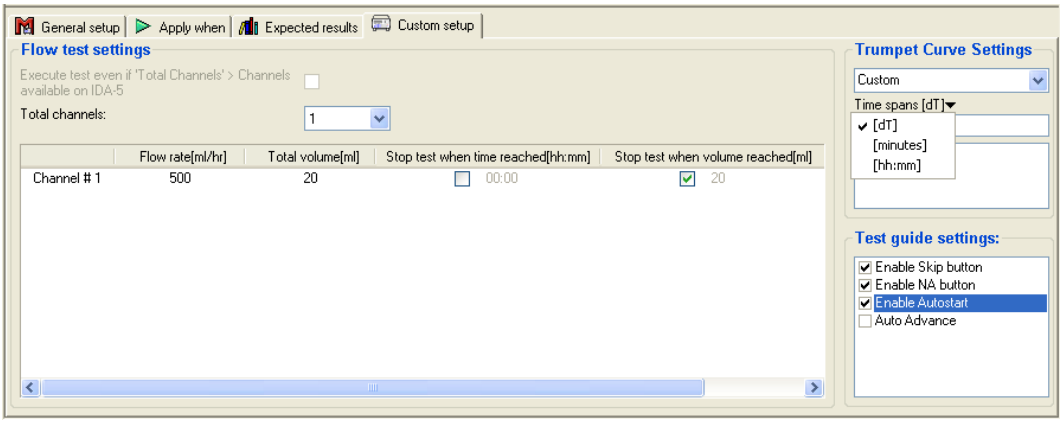
6. Make a new test template and add a flow test.

   A flow test is already added to the test template.

7. Set the flow test in the template window and click the **Custom Setup** tab.

8. Click the drop down button below the header **Trumpet curve settings**.

   A list of all default trumpet curve parameter values are shown in Figure 4-10.



hgc039.bmp

Figure 4-10. Selecting a Default Trumpet Curve Setting

9. In the drop down list, select the trumpet curve value IEC 601.2.24 § 50.104.

   The list closes and the window shows the values specified by the selection. The previous parameter values are disabled.

Notes

- *The largest observation window for the selected trumpet curve is 930 minutes (15 hours and 30 minutes). Consequently, the flow test must execute for the same period of time to get a valid trumpet curve.*
- *Sub-clause 50.104 also specifies that the range of the trumpet curve must be from the end of the stabilization period to the end of the test. To do the first part, specify a delay time that lets the pump to become stabile.*

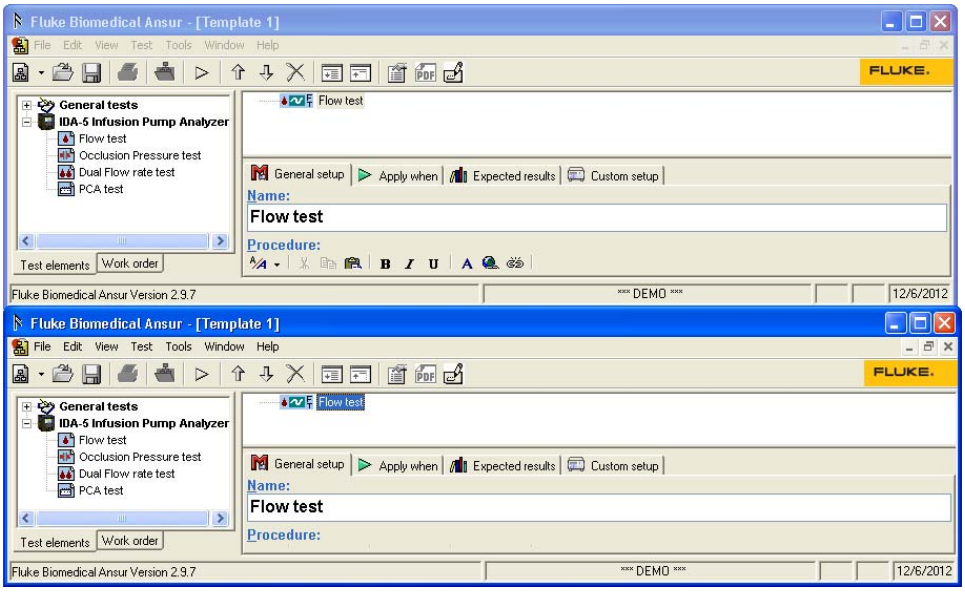
Test Two Infusion Pumps Simultaneously

The Plug-In can do tests on a maximum of twelve infusion pumps or channels at the same time. Each IDA-5 Analyzer can do tests on four pumps at the same time. A maximum of three IDA-5 Analyzers can be connected to the Plug-In at the same time. The example below shows how to do tests on two DUTs connect to one IDA-5 Analyzer that has two channels.

To do tests on two pumps, connect the two pumps to channels on the IDA-5. See "Connect the Analyzer" in the *IDA-5 Users Manual* for instructions on how to connect the infusion pumps to the IDA-5.

1. Start Ansur and make a test template with a flow test.
2. Save the test template.
3. Start another instance of Ansur and open the template you made in step 2.

   Two Ansur windows show on the screen. They show the same test as shown in Figure 4-11.



hgc040.bmp

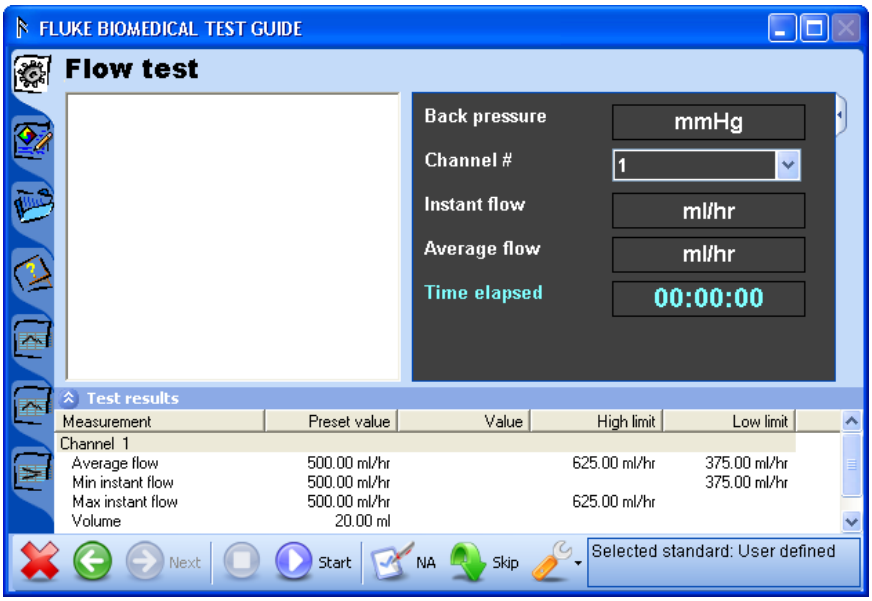
Figure 4-11. Running Two Instances of Ansur

Note

- *To see the two test guides at the same time when you do the test, organize the two Ansur windows as shown in Figure 4-11.*
- *In Microsoft Windows XP, right click the task bar and select* ***Tile Windows Horizontally*** *to have Windows align the Ansur windows automatically.*

4. Click **Test | Start Test** or click the start test icon (▶) on the main toolbar in the Ansur window, or click **F9** on the keyboard.

   Two Test Guide windows for **Flow test** show side by side in the display. Each window has the same view as the one shown in Figure 4-12.

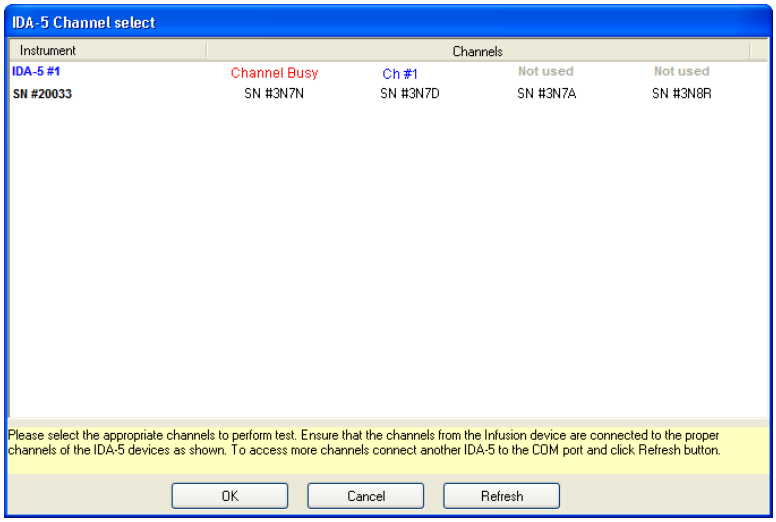


hgc041.bmp

Figure 4-12. Flow Test Test Guide Window

5. Put the Test Guide so that it does not hide the second Ansur Test Guide window.
6. Click on the first Ansur Test Guide window.
7. Set the channel where the first infusion pump is connected.
8. Prime the first infusion pump. See the “Prime the Analyzer” section in Chapter 3.
9. Click on the second Ansur Test Guide window.

   The channel that was set in the first Ansur Test Guide window cannot be set for this test template. This channel is shown as **Channel Busy** in the channel select window shown in Figure 4-13.



hgc042.bmp

Figure 4-13. Channel Select Window with a Busy Channel

10. Set the channel of the second infusion pump in the second Test Guide window.
11. Click to start the test.
12. Click to stop the test after it is done or wait for the test to stop automatically when total volume is reached.

Two test reports are generated for two infusion pumps.

How to Print Graphs and Trumpet Curves

To print flow graphs and trumpet curves, Ansur must be set to include graphics when you print a test report. Before you print the report, you can specify which of the flow graphs to include and to change the scale of the graphs or trumpet curves.

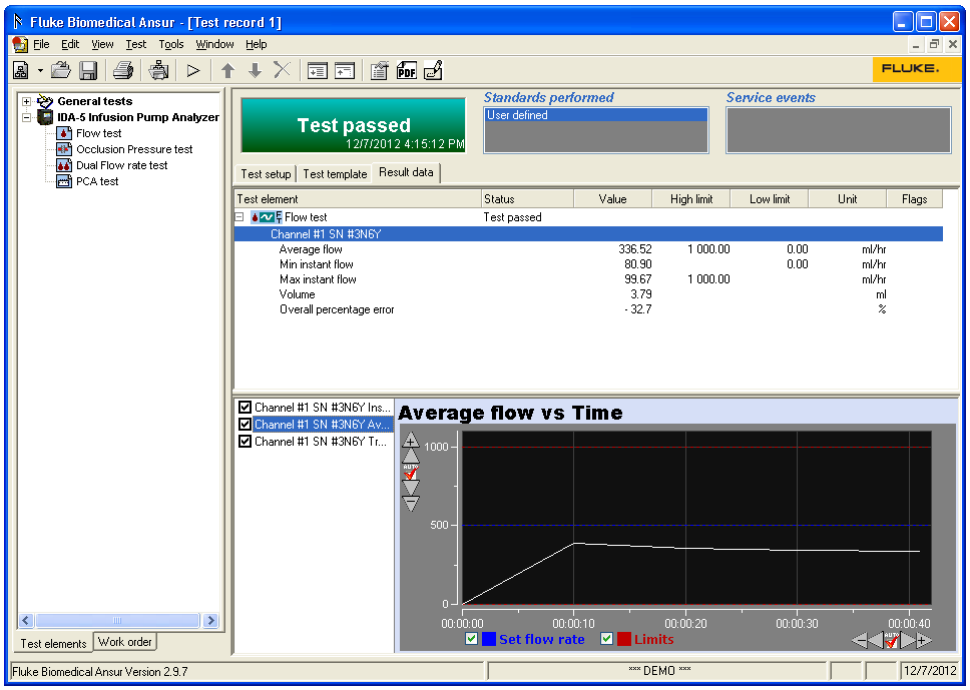
Configuring Flow Graphs

1. Do a flow test to get a test record, or open a test record that exists. When you open a test record, click the **Result Data** tab to show the results.

   The flow test results display in the Ansur Test Record window.

2. Click the line that contains the icon and name of the flow test.

   Detailed test results show at the bottom of the Test Record window. See Figure 4-14.



hgc043.bmp

Figure 4-14. Detailed Test Results

3. To change which graph is shown in the display, click one of the labels along the left side of the graph.
4. Use the Scaling buttons on the toolbar to change the graph.
5. Click the save icon (💾) to save changes to the file and print report.

To not include a graph from the printed report, click the check box to remove the check mark adjacent to the name of the graph.

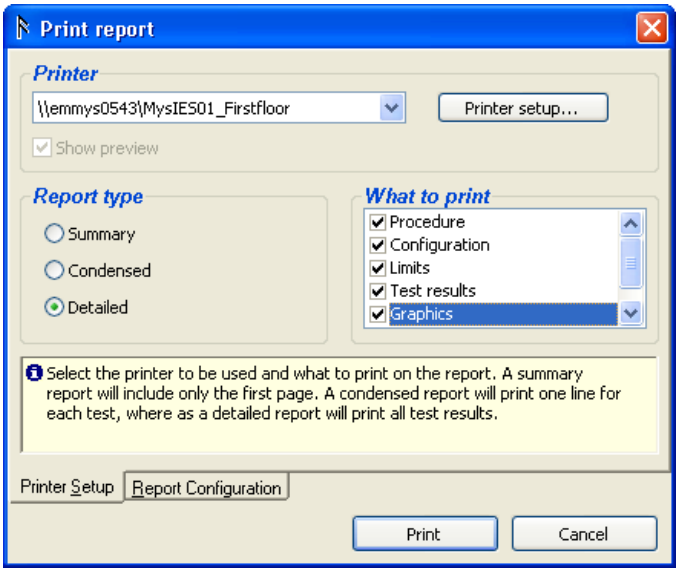
Note

*In Figure 4-14, the Test Explorer is hidden to give more room for test results. To hide the Test Explorer in the Ansur main menu, click **View Ansur Explorer**. To show the Test Explorer, click Ansur Explorer again.*

Printing Flow Graphs

1. Click **File | Print** or click the Print icon on the main toolbar, or push **CTRL+P** on the keyboard.

The Print Report window is shown in Figure 4-15.

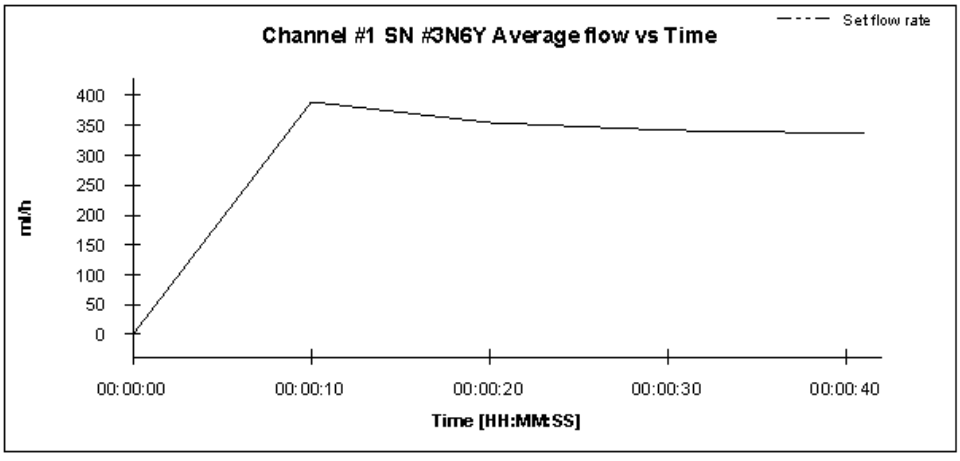


hgc044.bmp

Figure 4-15. Printing Graphics

2. In the **What to print** list box, click to add a check in the **Graphics** check box.
3. In the **Report type** box, click the **Detailed** option button.
4. Click the **Show preview** text box to add a check to show a preview of the print report. If the **Show Preview** check box does not have a check in it, the report will be sent directly to the printer and the Preview window will not show in the display.
5. Click the **Print** button to open the Preview window as shown in Figure 4-16.
6. Click the Print icon on the toolbar.

   The report prints to the default printer.



hgc045.bmp

Figure 4-16. Print Preview Window

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Reference

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Introduction

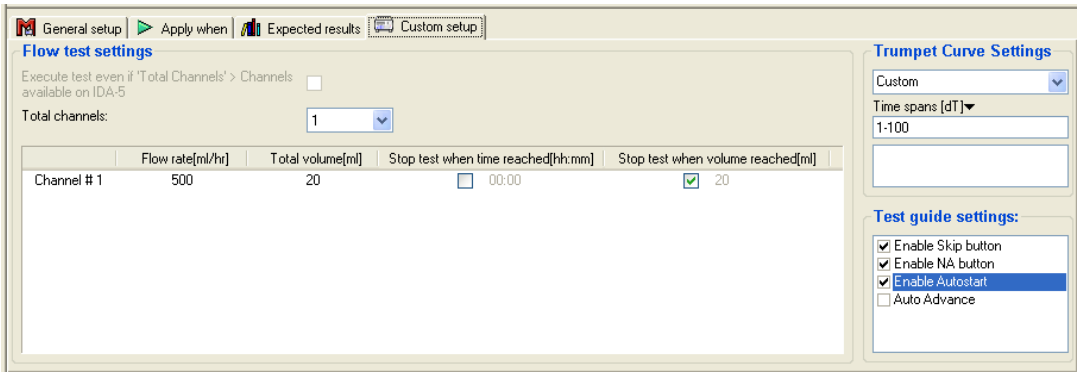
This chapter contains data on the IDA-5 (Analyzer) tests that this Plug-In remotely controls.

Flow Test Element

For Flow Test Element tests, the user sets the flow rate at the pump and the Analyzer measures the actual flow rate. Instant flow rate is measured continually at a given sample period for the test period. The Analyzer can derive minimum, maximum, and mean flow rates.

Custom Setup

The flow test period, the test parameters, and their performance criteria are specified through the **Custom setup** and **Expected results** tabs. Click on the **Custom setup** tab in the template window to show the window in Figure 5-1.



hgc033.bmp

Figure 5-1. Flow Test Custom Setup Window

Table 5-1 is a list of the flow test parameters and their description.

Table 5-1. Flow Test

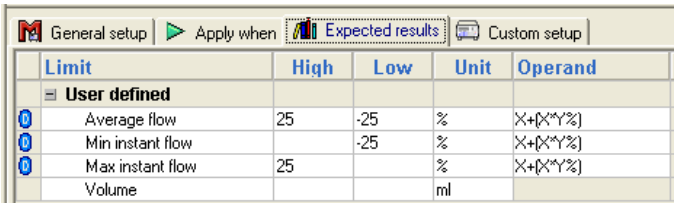
Setting	Description
Flow Test Settings	
Flow Rate	Flow rate is the flow set on the infusion pump. This value is used to calculate deviance in the flow measured by the IDA-5 and when instructing the user how to do the test in the Test Guide.
Total Volume	To set the volume, type in a value between 0 and 10000. When the measured volume is the same as the total volume, the test automatically stops.
Total Channels	Total Channels gives a selection of 12 channels on the IDA-5 Plug-In.
Test Guide Settings	
Enable Skip button	Adds the Skip Button to the Test Guide window to let the user skip the test and move to the subsequent test.
Enable NA Button	Adds the Not Applicable button to the Test Guide window to let the user flag the test as not applicable.
Auto Advance	Sets Ansur to automatically continue to the subsequent test at the end of the present test and show the Test Guide for the subsequent test element.

Figure 5-1. Flow Test (cont.)

Setting	Description
Auto Start	Auto Start causes the infusion pump analyzer to use its Auto-Start feature. When Auto-Start is used, the analyzer starts measurements when the fluid is sensed.
Stop Test when…	
Time reached	Stops the Flow test when the Time Reached time has expired.
Volume reached	Stops the Flow test when the measured volume value and the Volume reached value are equal.

Expected Results

The infusion pump must meet the limits specified in the Expected Results to pass the flow test. To set the expected results, click the **Expected results** tab to show the expected results grid in Figure 5-2.



hgc046.bmp

Figure 5-2. Flow Test Expected Results

These limits are usually expressed as a percentage of the pump flow rate as specified in Custom Setup.

The Operand menu specifies how Ansur calculates the limit values. The operand can be set to:

- Y – absolute value,
- X + Y – limit calculated as set flow rate + specified limit, or
- X + (X * Y %) – limit calculated as a percentage deviance from the set flow rate.

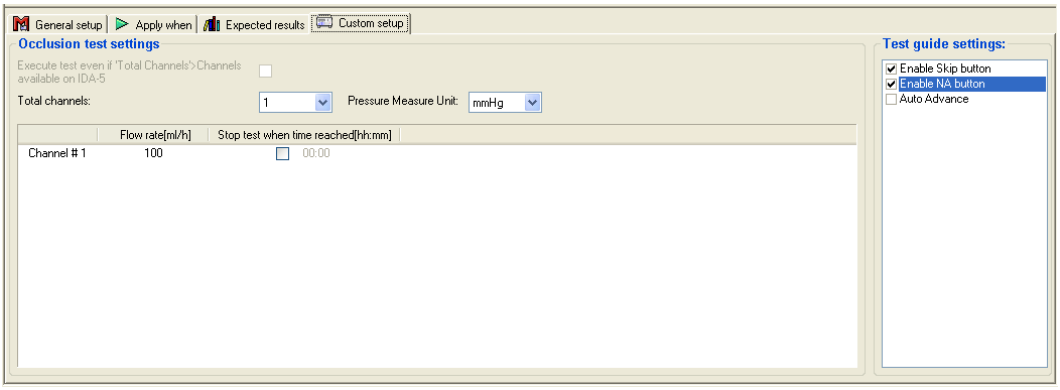
Occlusion Pressure Test Element

The Occlusion Test Element does a test of the occlusion pressure alarm on an infusion pump. For patient protection, the infusion pump must trip the alarm if the pressure in the administration set is more than the preset levels.

The IDA-5 senses the alarm level and measures the Bolus Volume to keep a safe level. The test parameters and their performance criteria are specified in the **Custom setup** and the **Expected results** tabs.

Custom Setup

To set the occlusion test parameters, click on the **Custom setup** tab in the template window to show the window in Figure 5-3.



hgc047.bmp

Figure 5-3. Occlusion Test Custom Setup

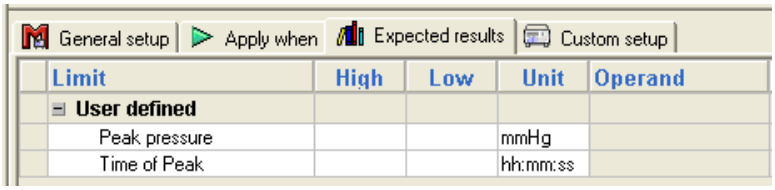
Table 5-2 is a list of the occlusion test parameters and their purpose

Table 5-2. Occlusion Test Settings

Setting	Description
Occlusion test settings	
Flow Rate	Pump Flow is the flow set on the infusion pump. This value is used in the test in the Test Guide.
Total Channels	Total Channels gives a selection of 12 channels on the IDA-5 Plug-In.
Pressure Measure Unit	Sets the pressure measurement units for the test. The default value is set in the preference screen.
Test Guide Settings	
Enable Skip button	Adds the Skip Button to the Test Guide window to let the user skip the test and move to the subsequent test.
Enable NA Button	Adds the Not Applicable button to the Test Guide window to let the user flag the test as not applicable.
Auto Advance	Sets Ansur to automatically continue to the subsequent test at the end of the present test and show the Test Guide for the subsequent test element.
Stop Test when…	
Time reached	Stops the Flow test when the Time Reached time has expired.

Expected Results

The infusion pump must meet the limits specified in the Expected Results to pass the occlusion test. To set the expected results, click the **Expected results** tab to show the expected results grid in Figure 5-4.



hgc048.bmp

Figure 5-4. Occlusion Test Expected Results

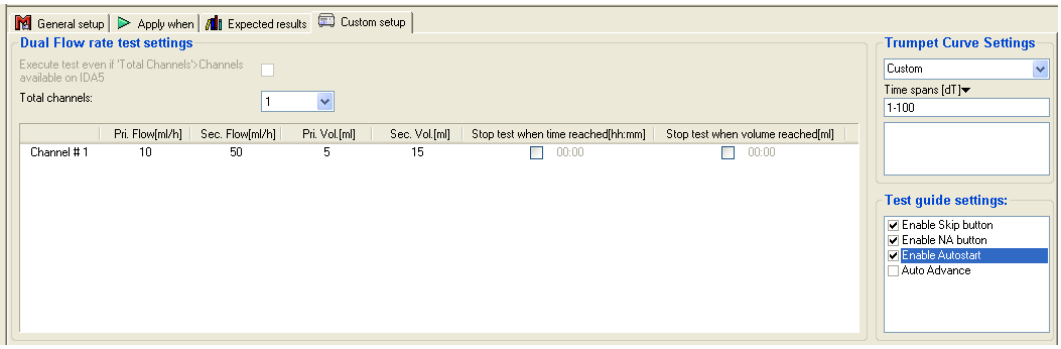
These limits are always expressed as absolute values.

Dual Flow Test Element

The Dual Flow Test Element does a test of the dual flow on an infusion pump device. The Dual Flow test has a specified test period and measures the Secondary Flow, Secondary Volume, Primary Flow, and Primary Volume.

Custom Setup

The Dual Flow test period, the test parameters, and their performance criteria are set through the **Custom setup** and **Expected results** tabs. To set the dual flow test parameters, click on the **Custom Setup** tab in the template window to show the window shown in Figure 5-5.



hgc023.bmp

Figure 5-5. Dual Flow Test Custom Setup

Table 5-3 is a list of Dual Flow test controls and their purpose.

Table 5-3. Dual Flow Test Settings

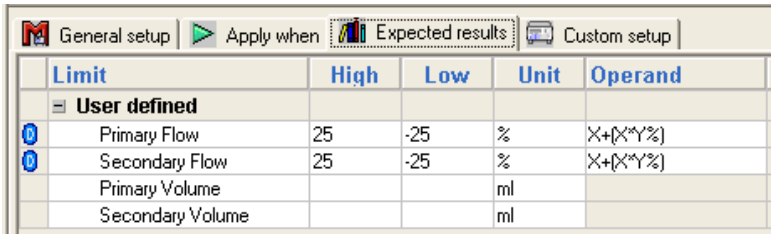
Setting	Description
Dual Flow test settings	
Test Time	Test Time specifies the length of the test.
Pri. Flow	The Primary Flow rate as set on the infusion pump. This is the flow rate of the second part of the delivery.
Sec. Flow	The Secondary Flow rate as set on the infusion pump. This is the flow rate of the first part of the delivery.
Pri. Volume	The volume set for the infusion pump to supply at Primary Flow.
Sec. Volume	The volume the infusion pump is set to supply at the Sec. Flow.
Total Channels	Total Channels gives a selection of 12 channels on the IDA-5 Plug-In.
Test guide settings	
Enable Skip button	Adds the Skip Button to the Test Guide window to let the user skip the test and move to the subsequent test.
Enable NA Button	Adds the Not Applicable button to the Test Guide window to let the user flag the test as not applicable.
Auto Advance	Sets Ansur to automatically continue to the subsequent test at the end of the present test and show the Test Guide for the subsequent test element.
Auto Start	Auto Start causes the infusion pump analyzer to use its Auto-Start feature. When Auto-Start is used, the analyzer starts measurements when the fluid is sensed.

Table 5-3. Dual Flow Test Settings (cont.)

Setting	Description
Stop Test when…	
Time reached	Stops the Flow test when the Time Reached time has expired.
Volume reached	Stops the Dual Flow test when the measured volume value and the Volume reached value are equal.

Expected Results

The infusion pump must meet the limits specified in the Expected Results to pass the Dual Flow test. To set the expected results, click the **Expected Results** tab to show the expected results grid in Figure 5-6.



gjb63.bmp

Figure 5-6. Dual Flow Test Expected Results

These limits are always expressed as absolute values.

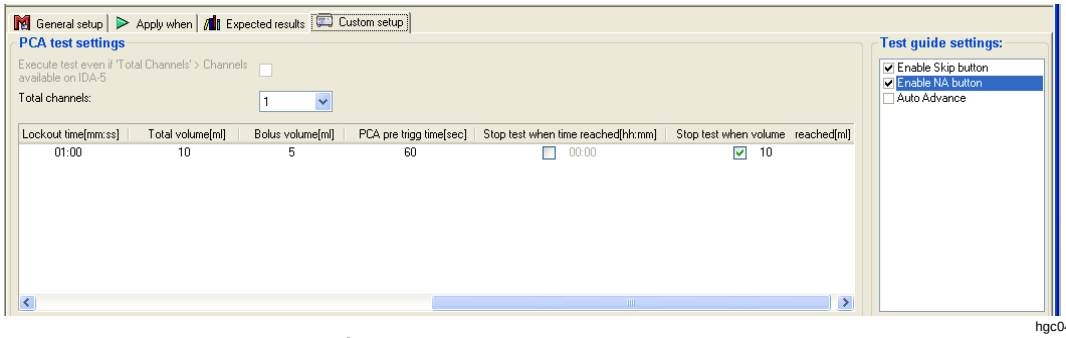
PCA Test Element

A PCA (Patient Control Analgesia) test does a test of the automated PCA pump control. The Bolus Volume is supplied to the patient demand, as set on the infusion pump. The PCA test can be set up as an unmonitored test.

The parameters to be tested and their acceptable performance criteria are defined within the Custom Setup and the Expected Result tabs.

Custom Setup

To set the PCA test settings, click on the **Custom Setup** tab in the template window to show the window shown in Figure 5-7.



hgc049.bmp

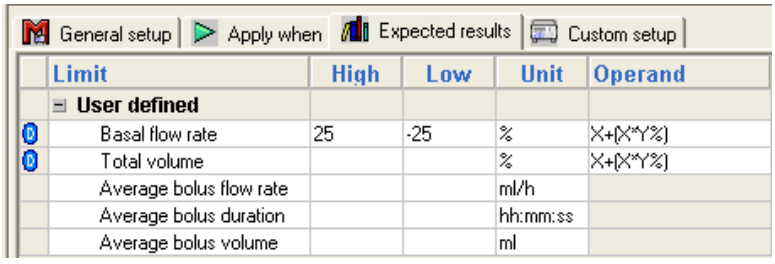
Figure 5-7. PCA Test Custom Setup

Table 5-4. PCA Test Settings

Setting	Description
PCA test settings	
Loading Dose	The dose programmed into the pump. This is detected as a bolus, but is often a different volume than patient demand.
Basal Flow Rate	The basal flow rate is the flow rate the infusion pump is set to deliver.
Lockout Time	The time in minutes and seconds, programmed into the infusion pump, that must elapse after one patient demand but before the next demand can be triggered.
Total Volume	The volume the infusion pump is set to deliver: the value is copied into the stop test time. Whenever the measured volume reaches Volume 1 + Volume 2, the test automatically stops execution.
Bolus Volume	The volume to be delivered during each patient demand, as set on the infusion pump.
Total Channels	Total Channels provides a selection of 12 channels available to the IDA-5 Plug-In.
Test guide settings	
Enable Skip button	Adds the Skip Button to the Test Guide window to allow the user to skip the test and move to the next test.
Enable NA Button	Adds the Not Applicable button to the Test Guide window to allow the user to flag the test as not applicable.
Auto Advance	Sets Ansur to automatically proceed to the next test at the end of the present test and show the Test Guide for the next test element.
Stop Test when…	
Time reached	Stops the Flow test when the Time Reached time has expired.
Volume reached	Stops the PCA test when the measured volume value and the volume reached value are equal.

Expected Results

The infusion pump must meet the limits specified in the Expected Results to pass the PCA test. To set the expected results, click the **Expected Results** tab to show the expected results grid in Figure 5-8.



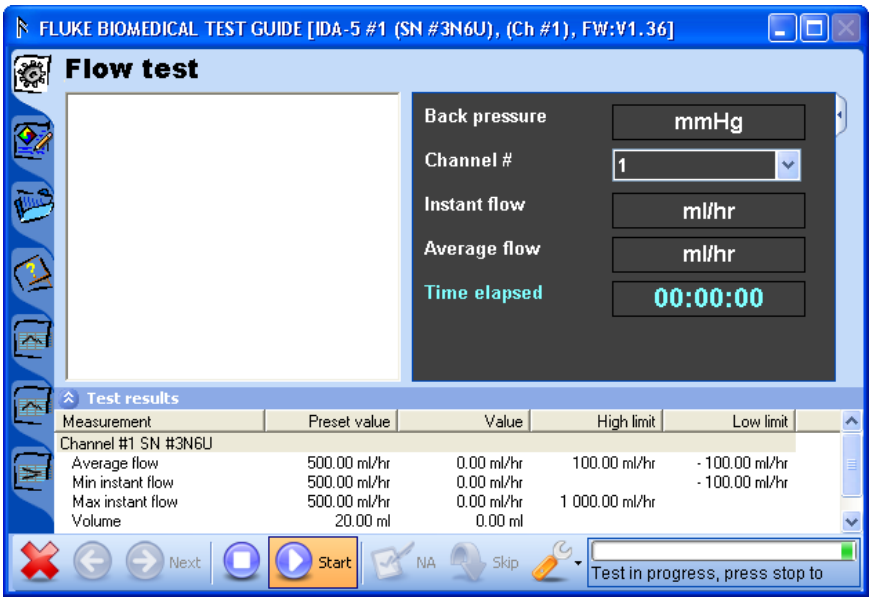
gjb65.bmp

Figure 5-8. PCA Test Expected Results

These limits are always expressed as absolute values.

Test Guide

When you use a test template, the Test Guide shown in Figure 5-9 is the user interface to the Analyzer.



hgc050.bmp

Figure 5-9. Test Guide

Information about the Test Guide tabs down the left side of the window for procedure (), comment (), and DUT details (), is in the *Ansur Test Executive User Manual*. The Flow Test has three more indices: Help (), Flow vs. Time graph (), Average Flow vs. Time graph () and Trumpet graph ().

When a test starts, the window caption shows the serial number (SN), channel number (Ch#) if applicable, and firmware version (FW) of the Analyzer used to do the test. If an Analyzer is not connected, this information is not available.

Toolbar Buttons

The buttons along the bottom of the Test Guide window are used to control the Analyzer tests. Table 5-5 is a list of these buttons with their names and a description of their function.

Table 5-5. Toolbar Buttons

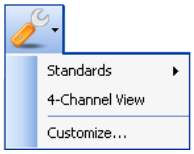
Button	Name	Description
	Abort	Abort the Test Template.
	Previous	Go to previous dialog screen.
	Next	Go to subsequent dialog screen.
	Start	Start a test.
	Stop	Stop a test.
	Not applicable	Flag test as not applicable.

Table 5-5. Toolbar Buttons (cont.)

Button	Name	Description
	Skip	Skip test and go to the subsequent test.
	Additional Features	Accesses the standards, options, and lets you customize the Test Guide toolbar.

Additional Features

The Additional Features drop-down list is shown in Figures 5-10. The content of the drop-down list will change with the Plug-In mode. The PCA trigger option is used to trigger the electrically triggered infusion pump through the PCA Trigger box.



hgc051.bmp

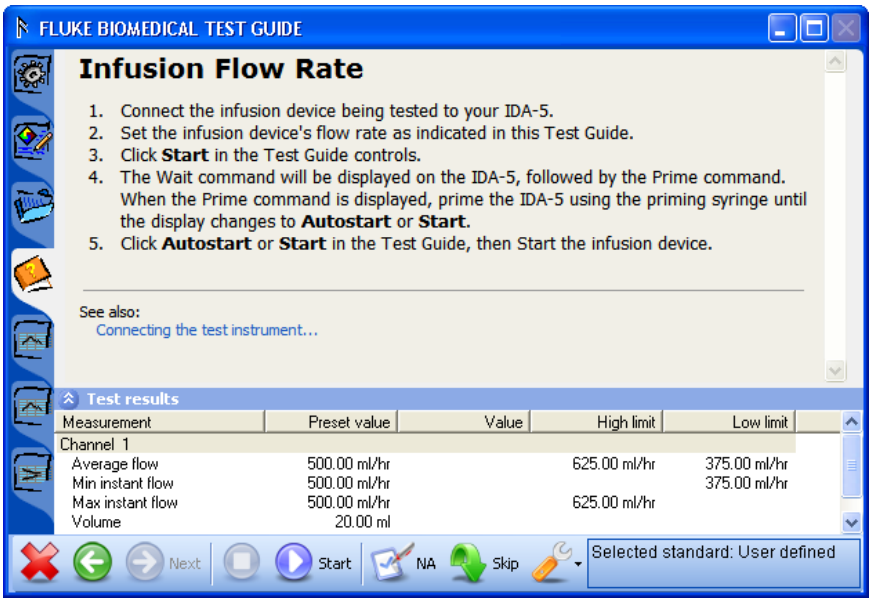
Figure 5-10. Test Guide Tools Menu PCA Trigger

Additional Test Guide Indices

The Flow Test element has three Test Guide indices.

Help Index

The Help Index contains information on how to use the test. Hyperlinks supply access to instructions for hardware configuration as shown in Figure 5-11.

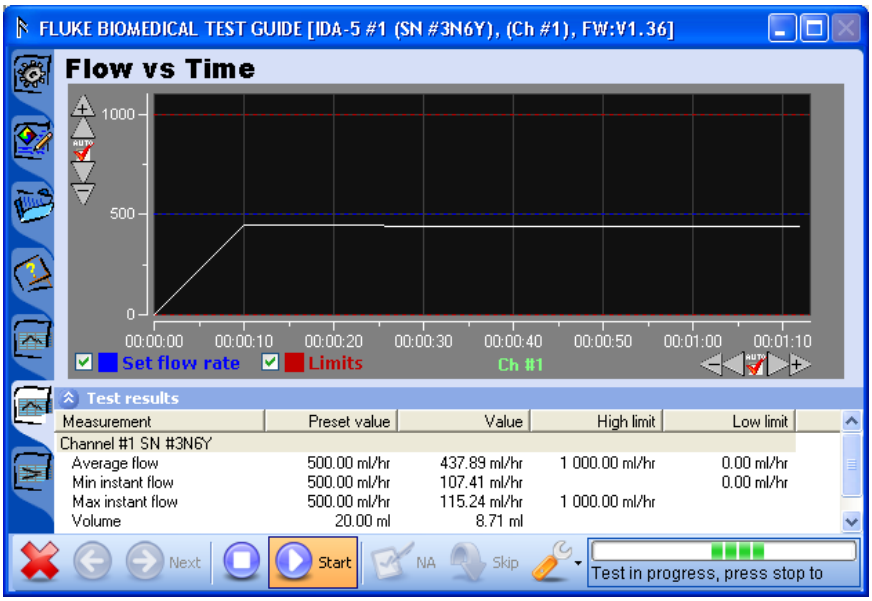


hgc052.bmp

Figure 5-11. Test Guide Help Page

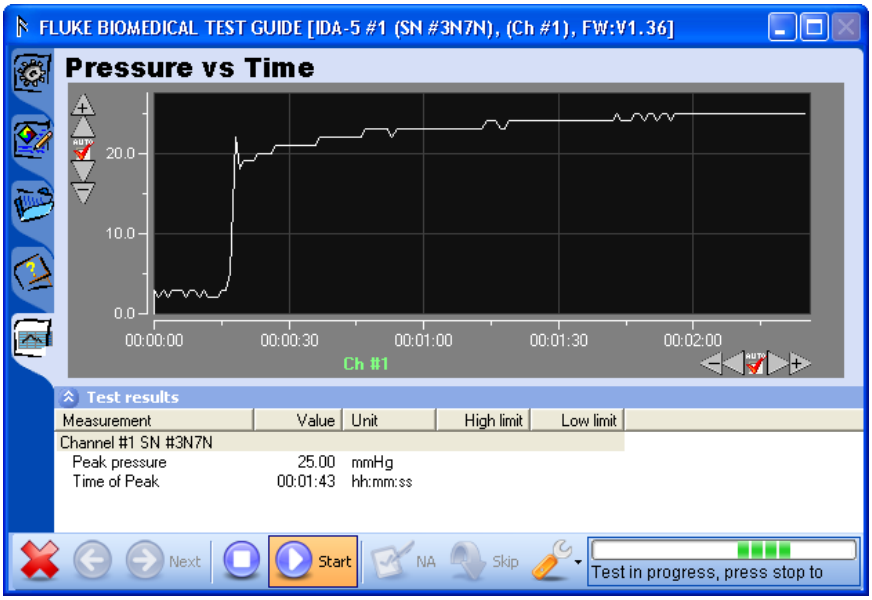
Real-Time Graphs

The next two indices show real-time test data in graphical form. These graphs can be edited. The flow vs. time index shows the instant flow while these measurements are made by the Analyzer. See Figure 5-12.



hgc053.bmp

Figure 5-12. Flow vs. Time Graph



hgc054.bmp

Figure 5-13. Pressure vs. Time Graph

In the Test Guide View for the Occlusion Test, you can toggle auto scaling and view measurements with the the Pressure vs. Time graph icon ( ).

hgc055.bmp

Figure 5-14. Flow vs. Time for PCA Test

In the Test Guide View for the PCA Test, the user can toggle auto scaling and view measurements with the the Flow vs. Time graph icon ( ).

Graph Editing

Every graph is equipped with a scale button group on each axis. Table 5-6 shows the scaling buttons and describes their purpose.

Note

When you click one of the zoom or pan buttons, auto scaling should be turned off.

Table 5-6. Scaling Button Options

X	Y	Description
		Zooms in. The span of the axis is decreased by 10 % while its center is maintained.
		Moves the graph right or up – pan left or down for example.
		Turns auto scaling on or off. When auto scaling is turned off the scale buttons turn yellow.
		Moves the graph left or down – pan right or up for example.
		Zooms out. The axis span is increased by 10 % while its center is maintained.

While auto scaling is turned on, scale the graph so that the full graph (all samples) is shown and the data is centered on the Y-axis. This lets you span an ±10 % more of the actual data range.

Click the Set Flow Rate legend (flow vs. time curve only) and the graph shows the flow rate set in the test configuration as a dotted line. The dotted line is the same color as the legend.

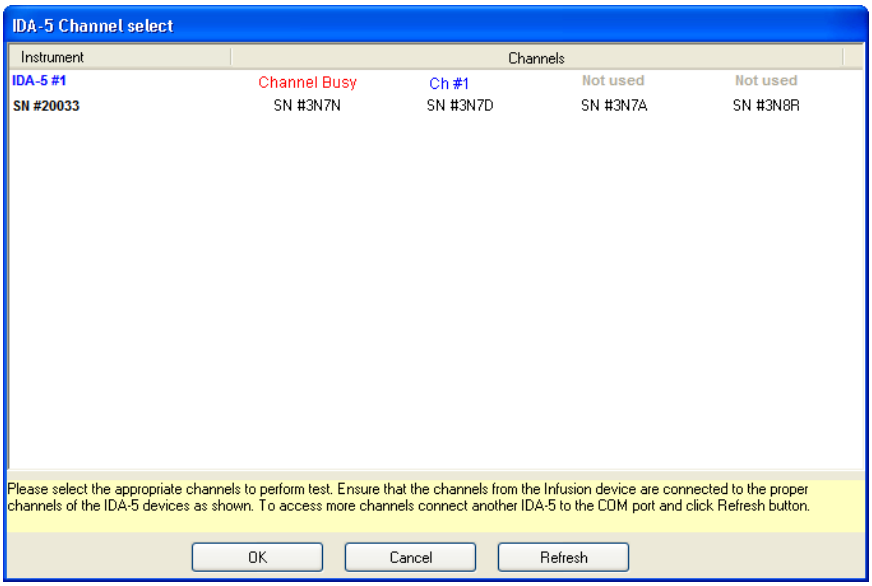
Click the limit legend checkbox (flow vs. time curve only) and the graph shows the

Instant Flow limits as dotted horizontal lines in the graph. The limit lines are the same color as the limit legend.

Changes to scaling or checkboxes are saved and show in the detailed result view and on any printed reports.

Channel Select Window

The Plug-In can control a maximum of 20 DUTs with 1 to 5 IDA-5 Infusion Pump Analyzers. By default, each DUT channel set through a custom setup window is assigned to the IDA-5 channels along with the serial number. Figure 5-15 shows channel #1 is assigned to the 1st channel of the IDA-5 instrument with the serial number by default.



hgc056.bmp

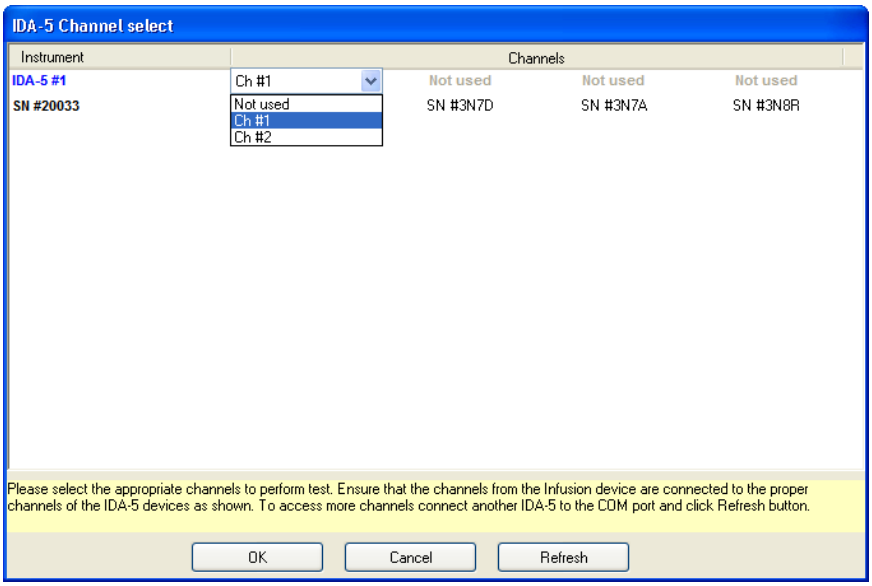
Figure 5-15. Channel Select Window

The instrument column shows the number of Analyzers connected to the Plug-In. It also shows a number is was assigned and the related SN# of the instrument.

Each Analyzer row, can show a maximum of four Analyzer channels. Click the **Refresh** button to find more analyzers connected to the Plug-In.

If the user connects the tubes to a 3rd channel of the IDA-5 Analyzer, then click **Not used** (3rd column of the Channels in the list) as shown in the Figure 5-15.

Figure 5-16 shows the three IDA-5 Analyzers connected to the PC with 12 DUT channels shown as their serial numbers. If the channel is used by different device, the **Channel Busy** text shows in the display. See Figure 5-15.

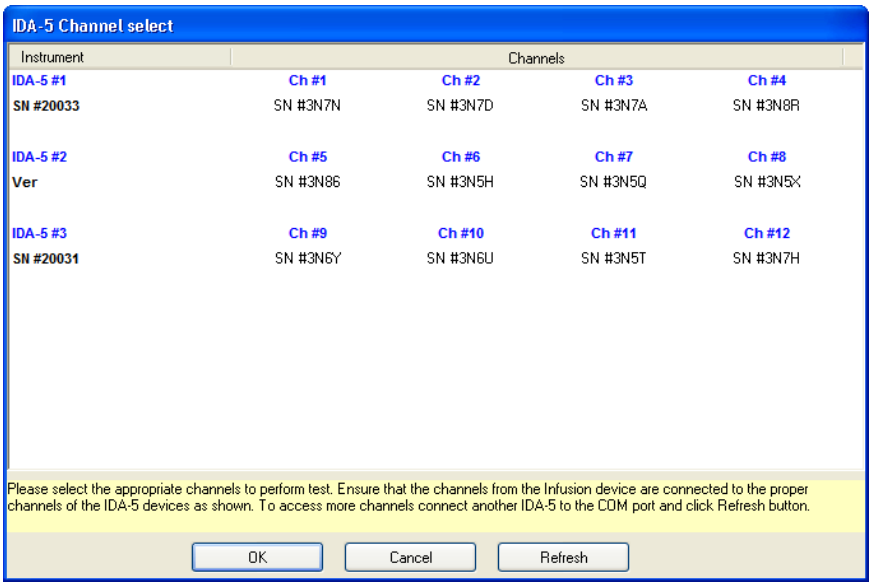


hgc057.bmp

Figure 5-16. Select Channel of Infusion Device

Multiple Channel Operation

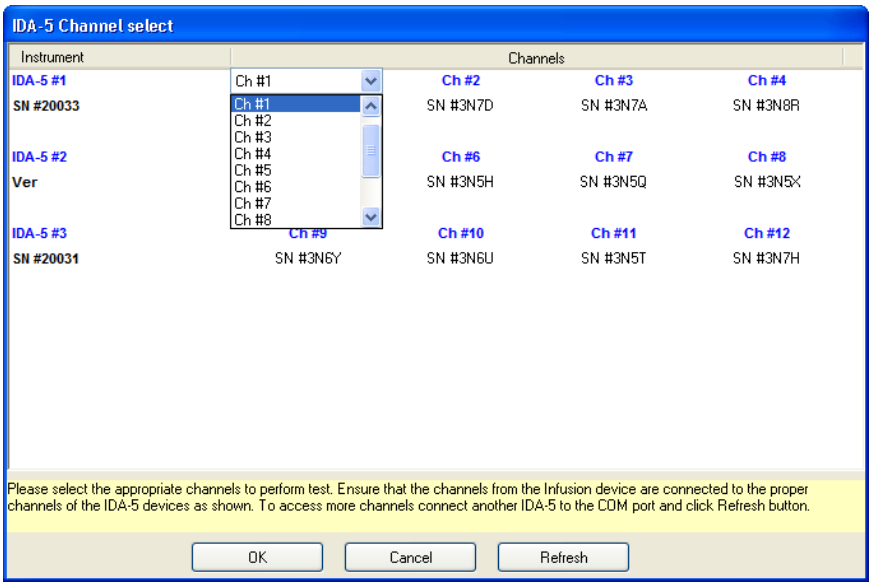
The Plug-In lets you connect multiple Analyzers and can do tests on a maximum of 12 channels at one time. Figure 5-17 shows the channel selection screen with 12 infusion pumps connected to the Plug-In through 3 Analyzers.



hgc058.bmp

Figure 5-17. Twelve Channel Select Screen

To change a channel assignment for an infusion pump click on a channel number to open the channel drop-down list as shown in Figure 5-18.



hgc059.bmp

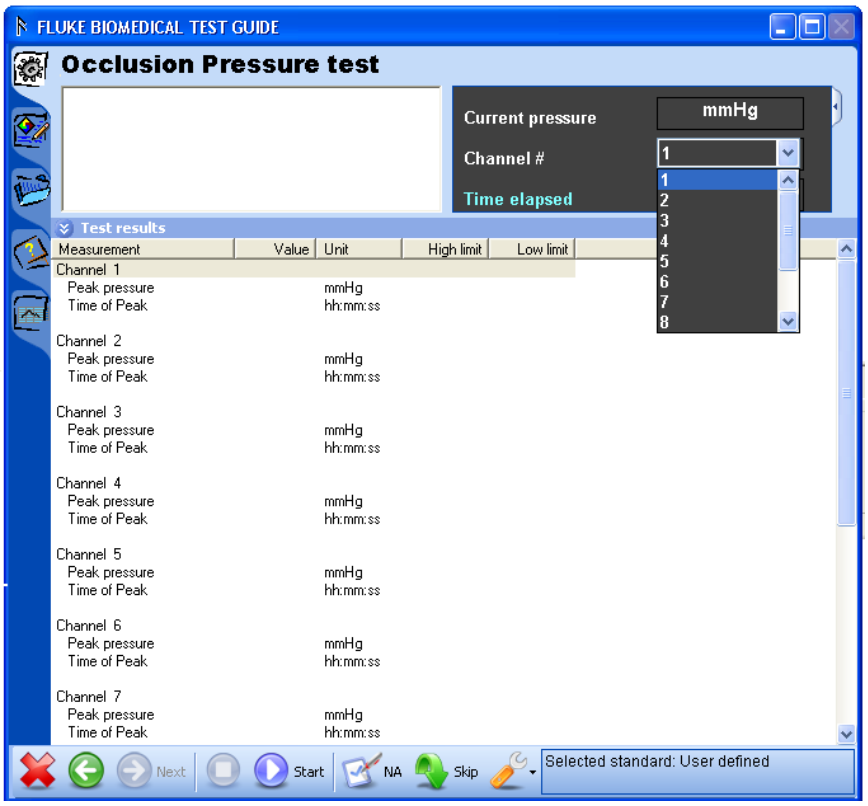
Figure 5-18. Channel Selection Drop-Down List

You can select channels in any order. For example, the first pump on the first Analyzer could be assigned to channel 5 and then the subsequent pump on the same analyzer could be assigned to channel 10. Sequential assignment of channel numbers is not necessary.

Note

You cannot change the instrument assignments in the ***Instrument*** *column of the screen.*

In the Test Guide screen, you can set a specific channel to see the data of the test on that channel in the upper-right corner of the screen. Click in the number field of the **Channel #** to open the drop-down channel selection list as shown in Figure 5-19.

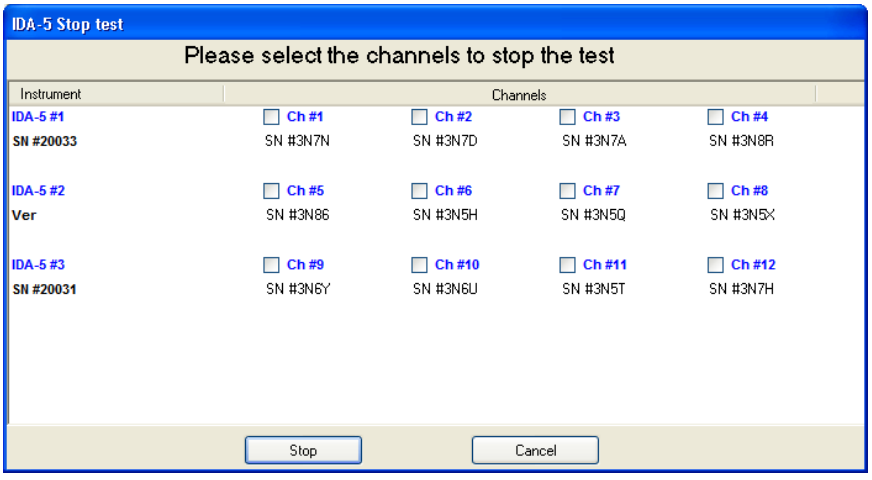


hgc060.bmp

Figure 5-19. Test Data Viewing by Channel

Stop Multiple Channel

To stop the test on one or all channels, click on the stop button ( ) to open the stop test screen shown in Figure 5-20.



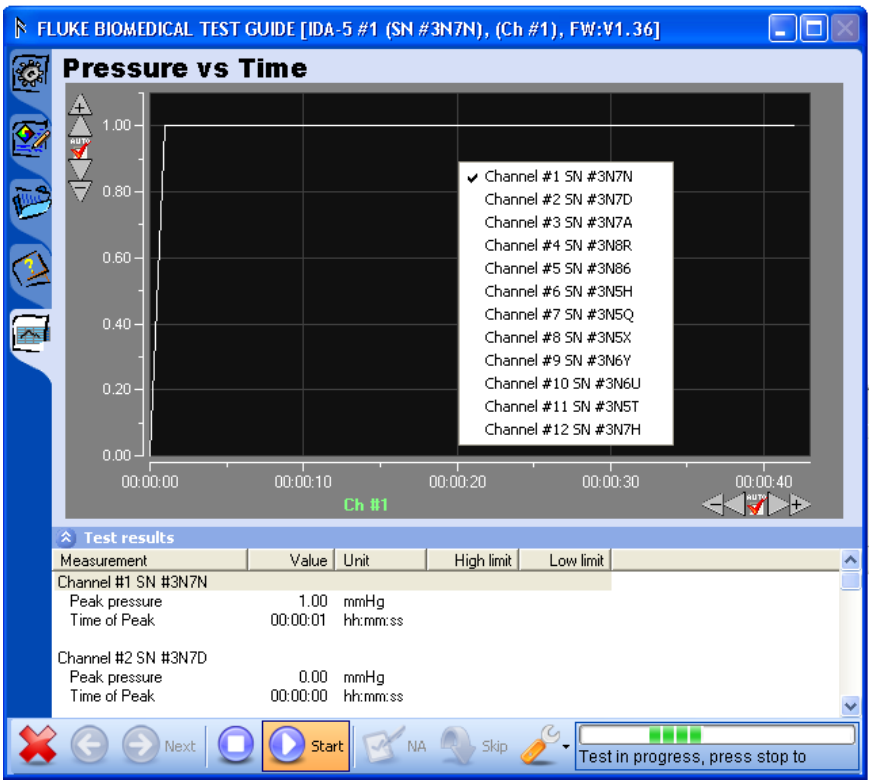
hgc061.bmp

Figure 5-20. Channel Stop Test Screen

Set the checkbox adjacent to one or more channel numbers to set that channel to receive a stop command. Click the **Stop** button to stop tests on the selected channels.

Selecting Multiple Channel Graphs

To see a graph of the test on a channel, click tab in the Test Guide window. Right-click on the graph to open the drop-down channel selection list as shown in Figure 5-21.



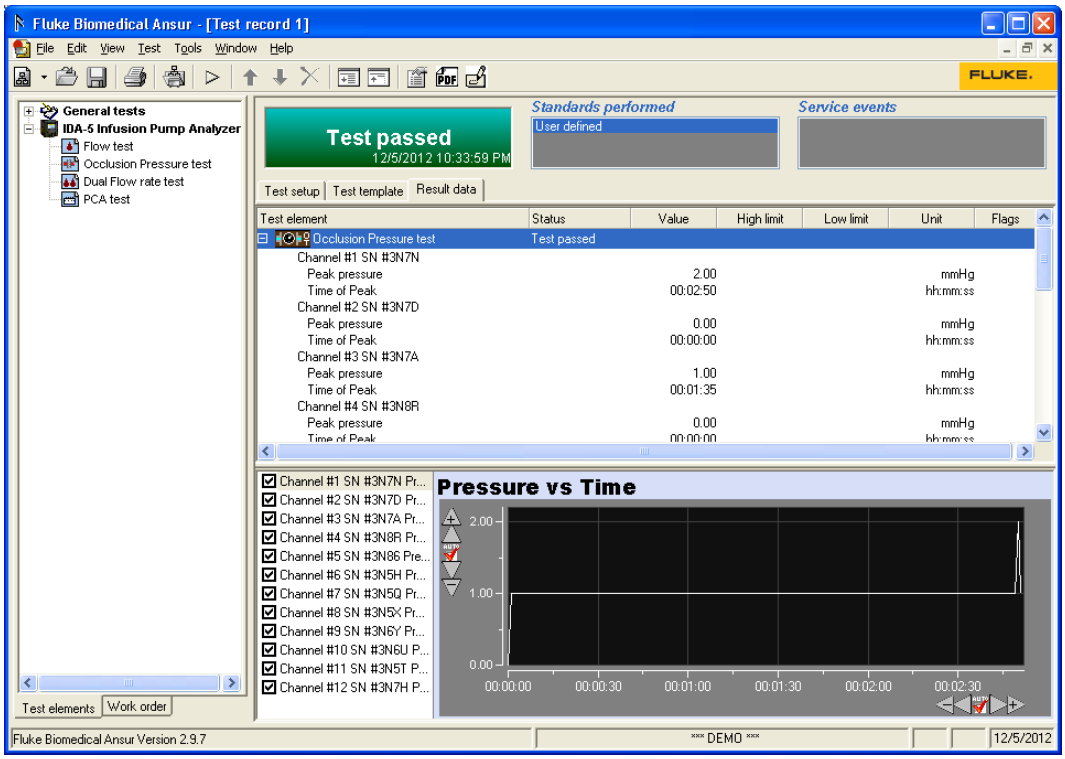
hgc062.bmp

Figure 5-21. Graph Channel Selection

Click on the channel to graph. When you set a channel for a graph view, the Analyzer number, serial number of the infusion pump connected to the channel, and the channel number are shown in the title bar of the Test Guide window.

Viewing Multiple Channel Test Results

Figure 5-22 shows how results data for multiple channel tests are shown in the display.

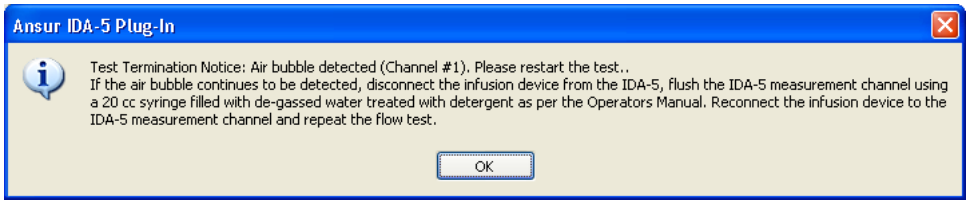


hgc063.bmp

Figure 5-22. Multiple Channel Test Results Screen

Bubble, Airlock, and Overpressure Messages

When a bubble, airlock, or overpressure is sensed, the test stops and the message box shown in Figure 5-23 shows in the display. The bubble or airlock must be removed from the line before the test can be started again.



hgc064.bmp

Figure 5-23. Bubble, Airlock, or Overpressure Message

Connecting IDA-5 Instruments

To connect to three IDA-5 instruments, three COM ports must be available on the PC.

If **Channel Select** is set to 6 and only one Analyzer is connected, the Plug-In will show the message in Figure 5-24 to prompt you to connect another Analyzer.

hgc065.bmp

Figure 5-24. Connect Another Instrument Message Box

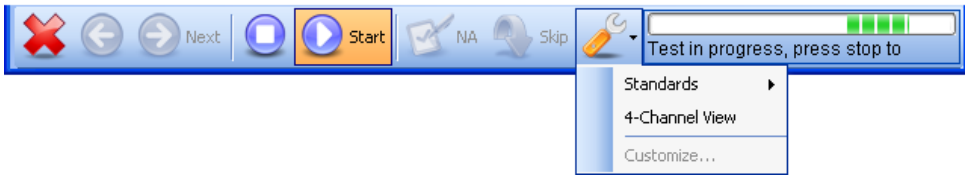
The channel numbers allocation for the three IDA-5 instruments is in incremental order of COM ports

- COM1 – Channel 1, Channel 2, Channel 3, Channel 4.
- COM2 – Channel 5, Channel 6, Channel 7, Channel 8.
- COM3 – Channel 9, Channel 10, Channel 11, Channel 12.

4-Channel View

The Plug-In can show a maximum of four infusion pump channels at one time. To show four channels:

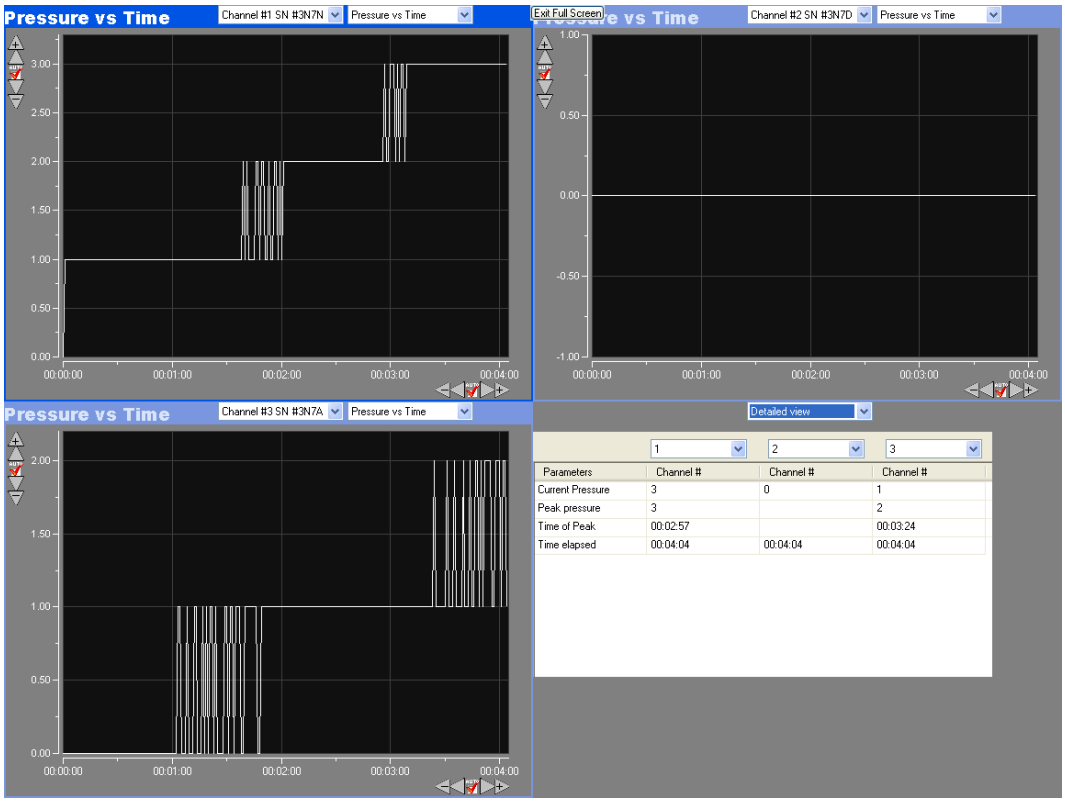
Click on the Tools button (🔧) at the bottom of the Test Guide window.



hgc066.bmp

Figure 5-25. 4-Channel View Selection

Click on **4-Channel view** in the drop-down list to open the four-panel screen shown in Figure 5-26.



hgc067.bmp

Figure 5-26. 4-Channel View

Use the left combo box at the top of a window pane to set the channel to show in that pane. When the Detailed view is set for a window pane, a numeric view of the data is shown in that pane. If applicable, use the right combo box to set the type of graph in each window pane.

Chapter 6
IDA-5 Mini Plug-In

Title **Page**

Introduction 6-3
Connect an Analyzer to a PC 6-3
Open the IDA-5 Mini Plug-In 6-3
Management of Test Records 6-4
- How to Get Test Records from the Analyzer 6-5
- How to Print Test Records 6-5
- How to Combine Test Results Files 6-5

Template Management 6-7
- How to Get Templates from the Analyzer 6-8
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- Create Templates 6-8
- Modify a Template 6-10
- Delete a Template 6-11

Utilities Management 6-11
- How to Set the Report Header 6-12
- How to Get User Notes from the Analyzer 6-12
- How to Send User Notes to the Analyzer 6-12
- Create a New User Note 6-12

Introduction

The IDA-5 Mini Plug-In is an Ansur IDA-5 Plug-In used to make and manage files for the IDA-5 Infusion Device Analyzer. The Mini Plug-In is installed with the Ansur IDA-5 Plug-In. This Mini Plug-In can:

- Get records, templates, and user notes from the Analyzer.
- Combine records from the same DUT information.
- Print records uploaded from the Analyzer.
- Send templates or user notes to the Analyzer.
- Set the report header for the Analyzer.

Connect an Analyzer to a PC

Note

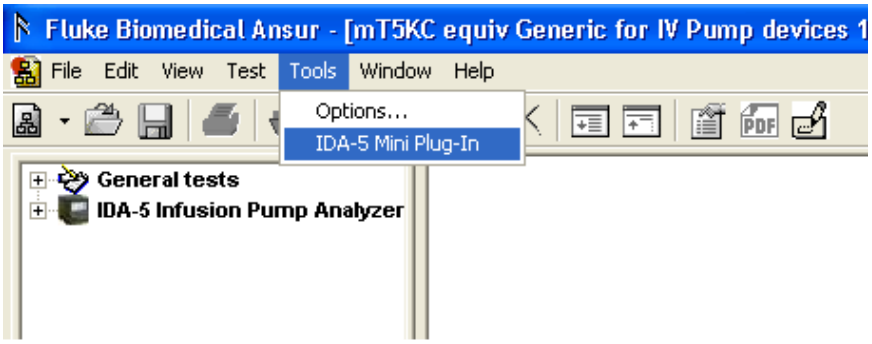
You must have Ansur Test Executive version 2.9.7 or higher installed on your PC to use this Mini Plug-In.

To use the Mini Plug-In, connect a USB port on your PC or laptop to the USB device Port of the Analyzer.

Open the IDA-5 Mini Plug-In

To open the Mini Plug-In:

1. Open Ansur Test Executive.
2. Click **Tools | IDA-5 Mini Plug-In** in the Ansur main menu. See Figure 6-1.



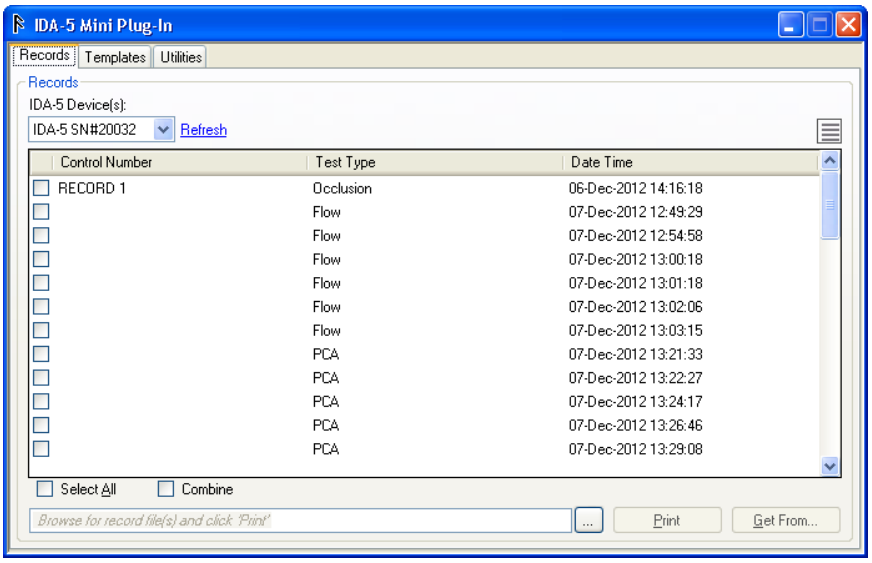
hgc068.bmp

Figure 6-1. Start the IDA-5 Mini Plug-In

Or

2. Click **Start | All Programs | Fluke | IDA-5 Mini Plug-In**.

The Mini Plug-In window in Figure 6-2 shows in the display.



hgc069.bmp

Figure 6-2. IDA-5 Mini Plug-In Window

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.

Management of Test Records

Test records in the IDA-5 can be downloaded to a PC with the Mini Plug-In. Click the **Records** tab along the top of the window. The test results window in Figure 6-2 shows in the display.

Note

By default, the Record tab with the list of records in the Analyzer is shown when the Mini Plug-In is opened.

A list of the controls and their explanation is shown in Table 6-1.

Table 6-1. Autosequence Window Controls

Control	Description
IDA-5 Device(s)	A list of IDA-5 Analyzers connected to the PC.
Select All	Sets all the records in the list.
Refresh	Rescan the Analyzer connect to the PC and update the list of records.
Combine	Combine the selected records based on the DUT fields.
Get from	Get the selected record from the Analyzer.
List view ( )	Show a list of records in the Analyzer with only the control number.
Detailed view ( )	Show a list of records in the Analyzer with the details (Test Type, DUT information, date and time of the test).
Browse ( )	Browse the PC for a record to print.
Get From…	Gets the autosequence from the Simulator and loads it into the PC.
Print	Display a print preview of the record selected for print.

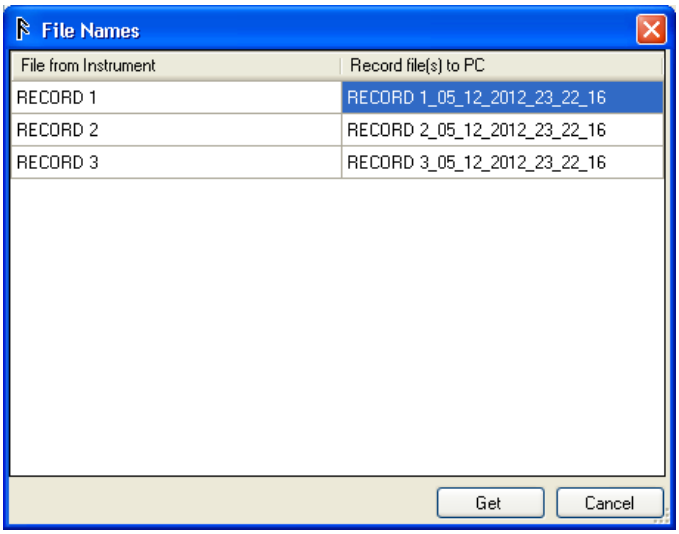
All test record files put on the PC are at \\..\My Documents\Ansur\ID5\. All test record file names have an extension of idar.

How to Get Test Records from the Analyzer

The Get From feature lets you download test records from the Analyzer to the PC.

To get one or more test records:

1. Click the checkbox adjacent to each test record name to get from the Analyzer. You can get more than one test record at a time.
2. Click the **Get From…** button. The File Names dialog box shown in Figure 6-3 shows in the display.



hgc070.bmp

Figure 6-3. File Names Dialog with Record Names

Note

The name of each test record to be downloaded is appended with an underline, the date, and time of the download for the name of the file on the PC. You can keep the name or change it.

3. Click the **Get** button.

How to Print Test Records

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 **Records** tab in the Mini Plug-In.
2. Click … and navigate to the test results file location.
3. Click the **Print** button.

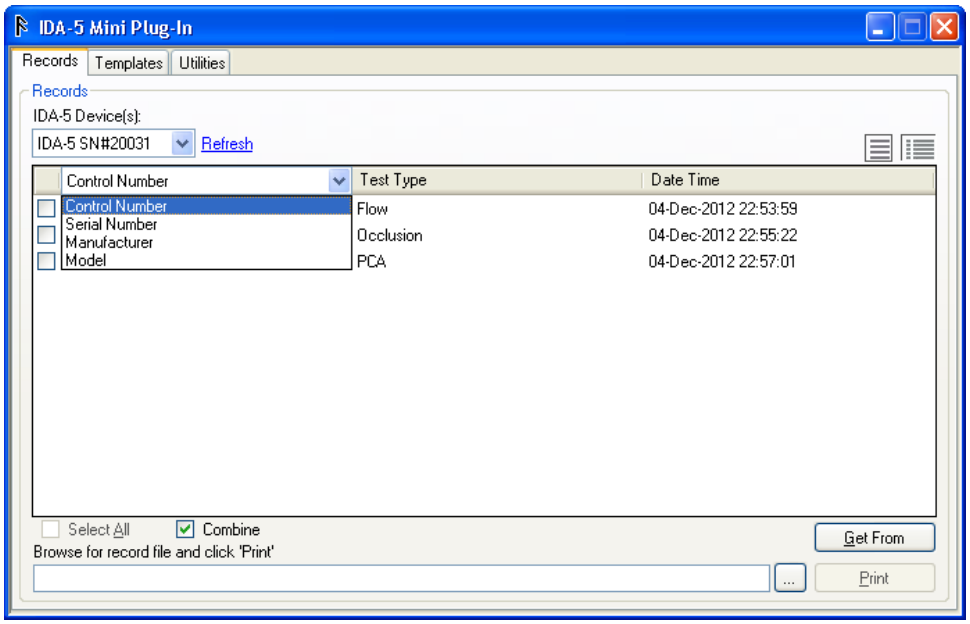
Note

Multiple Test Results files can be selected and printed.

How to Combine Test Results Files

Records that have the same DUT information (Control Number, serial number, manufacturer, or model can be combined. You can combine on one of the parameters. To combine test records for the same DUT:

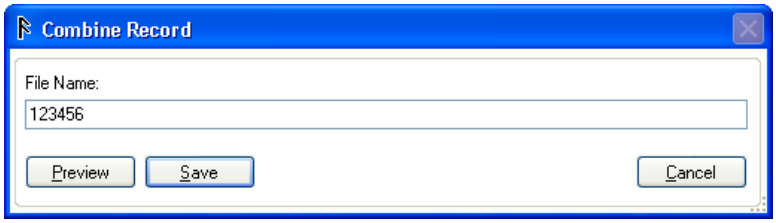
1. Click the **Combine** checkbox so a check shows.
2. In the combo box, select a parameter to use to combine test results on. See Figure 6-4.



hgc071.bmp

Figure 6-4. Combine Test Results Parameter Selection Dialog Box

3. Click the checkbox to the left of each record you want to combine.
4. Click on the **Get From…** button. The Combine Record dialog box in Figure 6-5 will show in the display.



hgc072.bmp

Figure 6-5. Combine Record Dialog Box

Table 6-2 is a list of the combine record controls and their description.

Table 6-2. Combine Record Controls

Control	Description
File Name	File name of the combined record.
Preview	Shows the preview of the combined record.
Save	Saves the combined record.
Cancel	Cancels the combine record procedure and returns to the main screen.

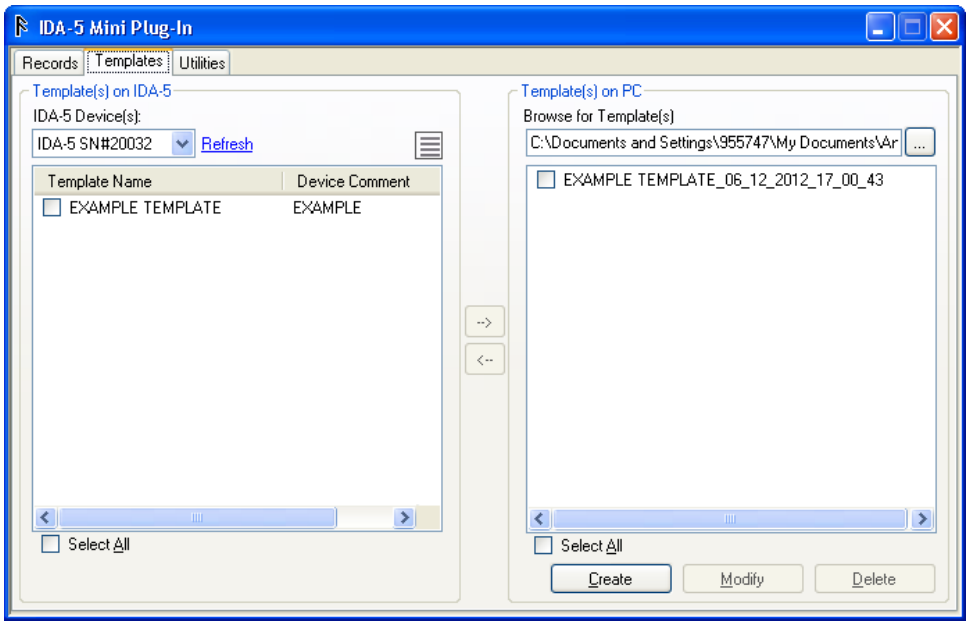
5. Click the **Preview** button to show the combined record.
6. Type in the name of the combined records.
7. Click the **Save** button.

Note

The default file name for the combined record will be the same as the first record selected in the Records tab.

Template Management

You can copy templates between the Analyzer and the PC with the Mini Plug-In. To copy a template, click the **Templates** tab to open the window shown in Figure 6-6. The templates on the IDA-5 are shown in the left panel and all templates on the PC are shown in the right panel



hgc073.bmp

Figure 6-6. Template Window

Table 6-3 is a list of controls and their explanation for the Template Window.

Table 6-3. Template Window Controls

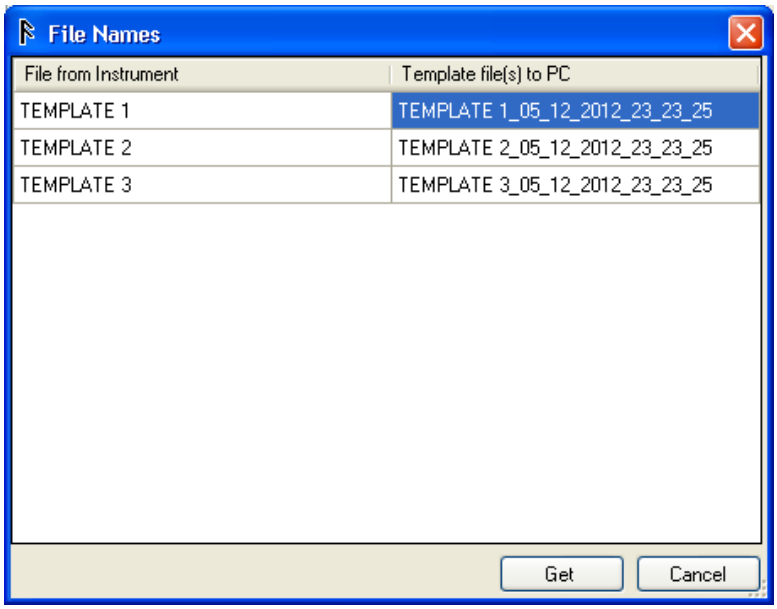
Control	Description
IDA-5 Device(s)	A list of IDA-5 Analyzers connected to the PC.
Refresh	Rescan the Analyzer connect to the PC and update the list of records.
List view	Show a list of records in the Analyzer with only the control number.
Detailed view	Show a list of records in the Analyzer with the details (Test Type, DUT information, date and time of the test).
Select All	Sets all the records in the list.
Download	Download the selected template(s) to the PC.
Upload	Upload the selected template(s) to the Analyzer.
Browse	Browse the PC for a record to print.
Create	Open the Add Template window to make a new template on the PC.
Modify	Open the Modify Template window to change the template in the PC.
Delete	Delete the selected template(s) from the PC.

All template files on the PC are put into \\...\My Documents\Ansur\IDA5. All template file names have an extension of idat.

How to Get Templates from the Analyzer

To copy a template from the Analyzer into the PC:

1. In the IDA-5 Mini Plug-In window, click the **Templates** tab.
2. Click in the box to the left of each template name in the left panel (Templates on IDA-5) to copy to the PC.
3. Click the download (⇨) button. The File Names dialog box in Figure 6-7 shows in the display.



hgc074.bmp

Figure 6-7. File Name Dialog Box

Note

The name of each template to be downloaded is appended with the date and time of the download for the name of the file on the PC. You can keep the name or change it.

4. Click the **Get** button to start the download.

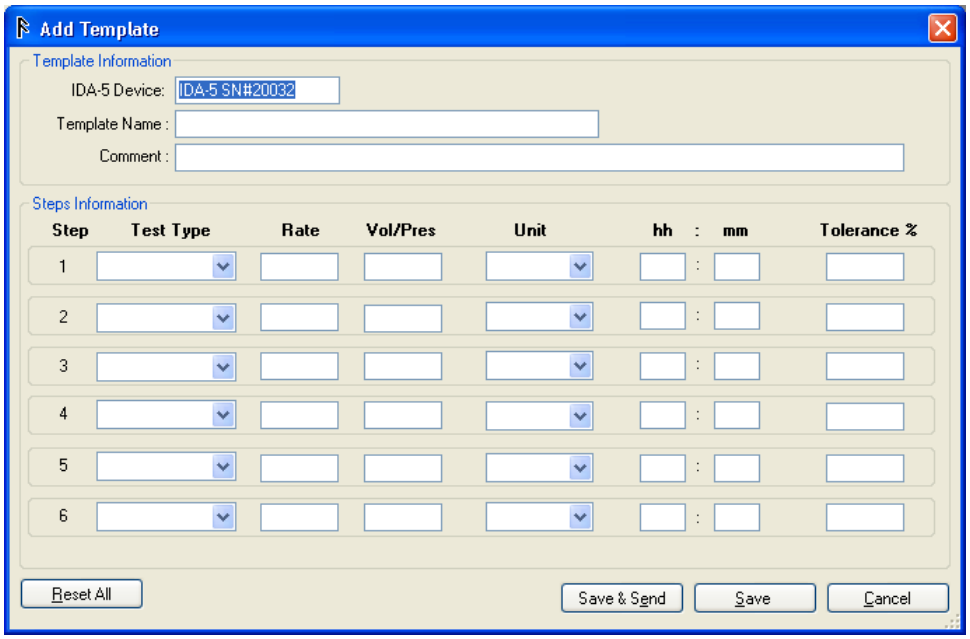
How to Upload Templates

To copy a template from the PC into the Analyzer:

1. In the IDA-5 Mini Plug-In window, click the **Templates** tab. As shown in Figure 6-6.
2. Click in the box to the left of each template name in the right panel (Templates on PC) to copy to the Analyzer.
3. Click the download (⇦) button.

Create Templates

Templates can be created on the PC with the Mini Plug-In. In the IDA-5 Mini Plug-In window click the **Create** button. The **Add Template** window in Figure 6-8 shows in the PC display.



hgc075.bmp

Figure 6-8. Add Template Window

Table 6-4 is a list of controls and their explanation.

Table 6-4. Add Template Controls

Control	Description
IDA-5 Device	List of IDA-5 Analyzers connected to the PC.
Template Name	Name of the template.
Comment	Comment for the template.
Step	Step number of the template.
Test Type	Type of test selected for the step.
Rate	Flow rate for the step.
Vol/Pres	Volume/Pressure for the step.
Unit	Unit of the volume/Pressure.
hh	Time in hours.
Tolerance	Tolerance for the step.
Reset All	Clear all the fields in the form.
Save & Send	Save the template and send the template to the Analyzer.
Save	Save the template.
Cancel	Returns to the IDA-5 Mini Plug-In window.

To make a new template:

1. Fill in the fields for each step of the test.
2. Click the **Save & Send** button to save the template and upload it to the Analyzer shown in the **IDA-5 Device** field.

Or

2. Click the **Save** button to only save the template on the PC.

Note

The unit conversion for the occlusion test is set by the Unit value set in the Add Template form.

Modify a Template

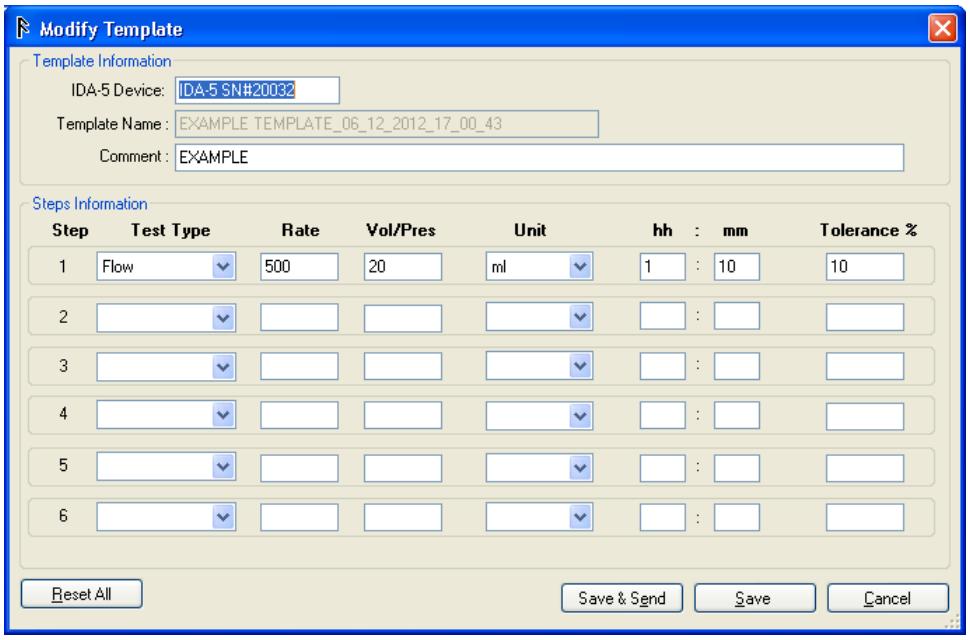
To modify a template:

1. In the IDA-5 Mini Plug-In window, click on the **Templates** tab.
2. Click the box to the left of a template name to modify in the right panel (Templates on PC) of the window.
3. Click the **Modify** button.

Note

The Modify button is disabled (grey) when more than on template in the list has a check in its box. You can only modify one template at a time.

The Modify Template window in Figure 6-9 shows in the PC display.



hgc076.bmp

Figure 6-9. Modify Template Window

4. Change the values of the fields in the steps to modify.
5. Click the **Save & Send** button to save the template and upload it to the Analyzer shown in the **IDA-5 Device** field.

Or

5. Click the **Save** button to save the template only.

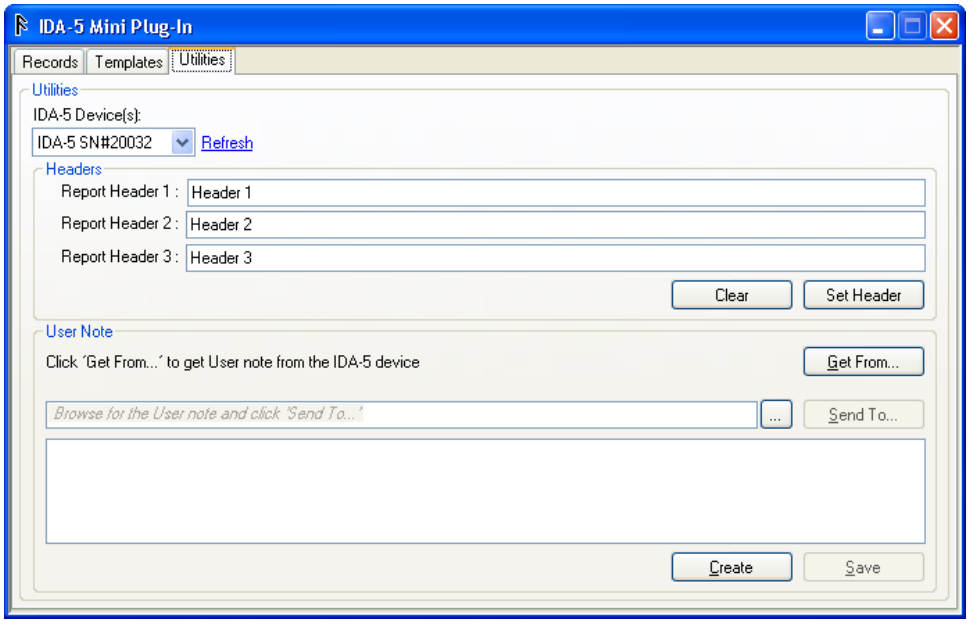
Delete a Template

To delete templates from the PC:

1. In the IDA-5 Mini Plug-In window, click on the **Templates** tab.
2. Click the box to the left of a template name to delete in the right panel (Templates on PC) of the window.
3. Click the **Delete** button.

Utilities Management

The report header and the user notes are contained in the utilities which can be downloaded to the PC. In the IDA-5 Mini Plug-In window, click on the **Utilities** tab to show utilities form. See Figure 6-10.



hgc077.bmp

Figure 6-10. Utilities Window

Note

When you click on the Utilities tab, the Report Header fields will update with the report headers in the Analyzer.

All user utilities files on the PC are put into \\...\My Documents\Ansur\IDA5. All utilities filenames have an extension idau.

Table 6-5 is a list of controls and their description for the utilities window.

Table 6-5. Utilities Window Controls

Control	Description
IDA-5 Device(s)	A list of IDA-5 Analyzers connected to the PC.
Refresh	Rescan the Analyzer connect to the PC and update the list of templates.
Report Header 1, 2, 3	Lines 1, 2, and 3 of the report header for the Analyzer
Set Header	Set the report header for the Analyzer.
Clear	Clear the report header fields.

Table 6-5. Utilities Window Controls (cont.)

Control	Description
Browse …	Browse the PC for user notes.
Get From…	Get the user note in the Analyzer.
Sent To…	Send the user note to the Analyzer.
Save	Save the user note on the PC.
Create	Create the user note on the PC.

How to Set the Report Header

To set the report header of the Analyzer:

1. From the **Utilities** window click the **Clear** button to clear the report header fields.
2. Type in the report header in the report header fields.
3. Click the **Set Header** button to set the header data into the Analyzer.

Note

Each report header field can contain a maximum of 35 characters.

How to Get User Notes from the Analyzer

To get user notes from the Analyzer, click the **Get From…** button. The user notes field will fill with the notes from the Analyzer.

Note

When the user notes are downloaded from the Analyzer, they are copied to \\...\My Documents\Ansur\IDA5 directory on the PC. The filenames have an idau extension.

How to Send User Notes to the Analyzer

To upload users notes to the Analyzer:

1. In the **Utilities** window, click … and highlight the user notes to upload.
2. Click the **Send To…** button to upload the user notes to the Analyzer.

Create a New User Note

To create a new user note:

1. In the **Utilities** window, click the **Create** button.
2. Type in your notes in the **User Note** field of the form.
3. Click on the **Save** button.