Bluehill 2 Software Reference

The difference is measurable®

Electromagnetic Compatibility

Where applicable, this equipment is designed to comply with International Electromagnetic Compatibility (EMC) standards.

To ensure reproduction of this EMC performance, connect this equipment to a low impedance ground connection. Typical suitable connections are a ground spike or the steel frame of a building.

Proprietary Rights Notice

Trademarks

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General Safety Precautions

Materials testing systems are potentially hazardous.

Materials testing involves inherent hazards from high forces, rapid motions, and stored energy. You must be aware of all moving and operating components in the testing system that are potentially hazardous, particularly force actuators or a moving crosshead.

Carefully read all relevant manuals and observe all Warnings and Cautions. The term Warning is used where a hazard may lead to injury or death. The term Caution is used where a hazard may lead to damage to equipment or to loss of data.

Instron products, to the best of its knowledge, comply with various national and international safety standards, in as much as they apply to materials and structural testing. Our products are designed to the Instron Safety Standard (ICP-CS503), which is available on request. This standard is derived from various national and international standards including IEC61010-1. We certify that our products comply with all relevant EU directives (CE mark).

Because of the wide range of applications with which our instruments are used, and over which we have no control, additional protection devices and operating procedures may be necessary due to specific accident prevention regulations, safety regulations, further EEA directives or locally valid regulations. The extent of our delivery regarding protective devices is defined in your initial sales quotation. We are thus free of liability in this respect.

At your request, we will gladly provide advice and quotations for additional safety devices such as protective shielding, warning signs or methods of restricting access to the equipment.

The following pages detail various general warnings that you must heed at all times while using materials testing equipment. You will find more specific Warnings and Cautions in the text whenever a potential hazard exists.

Your best safety precautions are to gain a thorough understanding of the equipment by reading your instruction manuals and to always use good judgement.

It is our strong recommendation that you should carry out your own safety risk assessment on the use of the test system, test methods employed, specimen loading and specimen behavior at failure.

Warnings

Crush Hazard - Allow only one person to handle or operate the system at all times.

Operator injury may result if more than one person operates the system. Before working inside the hazard area between the grips or fixtures, ensure that no other personnel can operate the computer or any of the system controls.

Crush Hazard - Take care when installing or removing a specimen, assembly, structure, or load string component.

Installation or removal of a specimen, assembly, structure, or load string component involves working inside the hazard area between the grips or fixtures. Keep clear of the jaws of a grip or fixture at all times. Keep clear of the hazard area between the grips or fixtures during actuator or crosshead movement. Ensure that all actuator or crosshead movements necessary for installation or removal are slow and, where possible, at a low force setting.

Hazard - Press the Emergency Stop button whenever you consider that an unsafe condition exists.

The Emergency Stop button removes hydraulic power or electrical drive from the testing system and brings the hazardous elements of the system to a stop as quickly as possible. It does not isolate the system from electrical power, other means are provided to disconnect the electrical supply. Whenever you consider that safety may be compromised, stop the test using the Emergency Stop button. Investigate and resolve the situation that caused the use of the Emergency Stop button before you reset it.

Flying Debris Hazard - Make sure that test specimens are installed correctly in grips or fixtures in order to eliminate stresses that can cause breakage of grip jaws or fixture components.

Incorrect installation of test specimens creates stresses in grip jaws or fixture components that can result in breakage of these components. The high energies involved can cause the broken parts to be projected forcefully some distance from the test area. Install specimens in the center of the grip jaws in line with the load path. Insert specimens into the jaws by at least the amount recommended in your grip documentation. This amount can vary between 66% to 100% insertion depth; refer to supplied instructions for your specific grips. Use any centering and alignment devices provided.

Hazard - Protect electrical cables from damage and inadvertent disconnection.

The loss of controlling and feedback signals that can result from a disconnected or damaged cable causes an open loop condition that may drive the actuator or crosshead rapidly to its extremes of motion. Protect all electrical cables, particularly transducer cables, from damage. Never route cables across the floor without protection, nor suspend cables overhead under excessive strain. Use padding to avoid chafing where cables are routed around corners or through wall openings.

Warnings

High/Low Temperature Hazard - Wear protective clothing when handling equipment at extremes of temperature.

Materials testing is often carried out at non-ambient temperatures using ovens, furnaces or cryogenic chambers. Extreme temperature means an operating temperature exceeding 60 °C (140 °F) or below 0 °C (32 °F). You must use protective clothing, such as gloves, when handling equipment at these temperatures. Display a warning notice concerning low or high temperature operation whenever temperature control equipment is in use. You should note that the hazard from extreme temperature can extend beyond the immediate area of the test.

Hazard - Do not place a testing system off-line from computer control without first ensuring that no actuator or crosshead movement will occur upon transfer to manual control.

The actuator or crosshead will immediately respond to manual control settings when the system is placed off-line from computer control. Before transferring to manual control, make sure that the control settings are such that unexpected actuator or crosshead movement cannot occur.

Robotic Motion Hazard - Keep clear of the operating envelope of a robotic device unless the device is de-activated.

The robot in an automated testing system presents a hazard because its movements are hard to predict. The robot can go instantly from a waiting state to high speed operation in several axes of motion. During system operation, keep away from the operating envelope of the robot. De-activate the robot before entering the envelope for any purpose, such as reloading the specimen magazine.

Hazard - Set the appropriate limits before performing loop tuning or running waveforms or tests.

Operational limits are included within your testing system to suspend motion or shut off the system when upper and/or lower bounds of actuator or crosshead travel, or force or strain, are reached during testing. Correct setting of operational limits by the operator, prior to testing, will reduce the risk of damage to test article and system and associated hazard to the operator.

Electrical Hazard - Disconnect the electrical power supply before removing the covers to electrical equipment.

Disconnect equipment from the electrical power supply before removing any electrical safety covers or replacing fuses. Do not reconnect the power source while the covers are removed. Refit covers as soon as possible.

Warnings

Rotating Machinery Hazard - Disconnect power supplies before removing the covers to rotating machinery.

Disconnect equipment from all power supplies before removing any cover which gives access to rotating machinery. Do not reconnect any power supply while the covers are removed unless you are specifically instructed to do so in the manual. If the equipment needs to be operated to perform maintenance tasks with the covers removed, ensure that all loose clothing, long hair, etc. is tied back. Refit covers as soon as possible.

Hazard - Shut down the hydraulic power supply and discharge hydraulic pressure before disconnection of any hydraulic fluid coupling.

Do not disconnect any hydraulic coupling without first shutting down the hydraulic power supply and discharging stored pressure to zero. Tie down or otherwise secure all pressurized hoses to prevent movement during system operation and to prevent the hose from whipping about in the event of a rupture.

Hazard - Shut off the supply of compressed gas and discharge residual gas pressure before you disconnect any compressed gas coupling.

Do not release gas connections without first disconnecting the gas supply and discharging any residual pressure to zero.

Explosion Hazard - Wear eye protection and use protective shields or screens whenever any possibility exists of a hazard from the failure of a specimen, assembly or structure under test.

Wear eye protection and use protective shields or screens whenever a risk of injury to operators and observers exists from the failure of a test specimen, assembly or structure, particularly where explosive disintegration may occur. Due to the wide range of specimen materials, assemblies or structures that may be tested, any hazard resulting from the failure of a test specimen, assembly or structure is entirely the responsibility of the owner and the user of the equipment.

Hazard - Ensure components of the load string are correctly pre-loaded to minimize the risk of fatigue failure.

Dynamic systems, especially where load reversals through zero are occurring, are at risk of fatigue cracks developing if components of the load string are not correctly pre-loaded to one another. Apply the specified torque to all load string fasteners and the correct setting to wedge washers or spiral washers. Visually inspect highly stressed components such as grips and threaded adapters prior to every fatigue test for signs of wear or fatigue damage.

Table of Contents

Chapter 1
Getting Started

The **Home** screen is the first screen that appears when the software opens (unless you configure the Start-up defaults differently). This section contains the following topics:

Welcome to the Bluehill® software reference help

The software reference manual provides much of the same information from the online help file. This manual describes how to use the various functions available in the software.

There is also a calculation reference manual that provides detailed information on numerous calculations.

New users can refer to the "Getting Started" and "How To" chapters to gain a basic understanding of the software.

To get help at any time, press F1 or click *at the top of the software screen.*

Home screen

This screen is:

- the first screen that appears when the software opens (unless you have configure the Start-up Defaults differently).

- where you select the task that you want to perform.

The console at the top of the screen is a separate part of the software and is different for different controllers. Refer to "Console" on page 1-4 for details about the system console.

To display a company logo on the **Home** screen, refer to "Specify your company logo" on page 3-8.

The following sections describe the function of each button on the **Home** screen.

Test button

Click this button to run tests on specimens. The software displays a sequence of screens where you:

1. choose a test method from which to load test parameters.

2. name the sample and select a location to store the test data.

3. run tests.

Refer to "Perform a test" on page 2-4 for details on this procedure.

There is also an option (**Continue Sample**) to reopen a sample and test more specimens, adding the data from those specimens to an existing sample. You can also use this option to review data from a previously-created sample. Refer to "Continue testing a sample" on page 5-5.

*The **Continue Sample** option was known as Resume in Merlin software.*

Method button

*If security is enabled, only Managers and Administrators have access to the **Method** tab. Refer to "Security reference" on page 7-2 for more details.*

Click this button to edit and save test method files. The software moves through a sequence of screens where you:

1. choose a test method to edit.

2. make changes to the test parameters and either save those changes back to the original test method file (Save) or to a new test method file (Save As).

Use your test method to start a sample.

Refer to "Create or modify a test method" on page 2-1 for details on this procedure.

Report button

*The **Report** tab is only available if you purchased the optional Reports and Graphs Pack.*

*If security is enabled, only Managers and Administrators have access to the **Report** tab. Refer to "Security reference" on page 7-2 for more details.*

Click this button to edit and save report template files. The software moves through a sequence of screens where you:

1. choose a report template to edit
2. make changes to the template and either save those changes back to the original report template file (Save) or to a new report template file (Save As)

Use your report template to generate reports for a sample.

Refer to "Create or modify a report template" on page 2-3 for details on this procedure.

Admin button

Click this button to change the configuration of the testing system. This may include adding or removing hardware, enabling different software options or setting up the system security. There is a View System Information screen to view and print all the version information and system identification numbers for the testing system.

User button

This button is grayed if Security is not enabled.

Click this button to log out the current user and let a new user log in to the software. When you log out you do not exit the program.

Refer to "Setup Security" on page 3-3 to enable this feature.

Help button

Click this button to open the online help.

Exit button

Click this button to exit the program.

Console

The Console at the top of the screen is a separate part of the software and is different for different controllers. The 8800 Console has different control features from the 5500 Console, for example. The Console is always visible and always available from any screen within the software.

*Although the Console is visible for monitoring purposes on the **Home** Screen, do not change any settings in the Console until you open a test method, either for editing or for testing. Certain console parameters are stored in the test method, and these are reset to the values specified in the method when you open the method.*

Console for 5900, 5500, 5500A, IS02, 4400, 4300, 4200 and 3300 systems

The Console for all of these controllers looks the same but the features available within each of the Console dialog boxes vary.

In summary:

- 5900, 5500, 5500A and IS02 controllers support all features.

- 3300, 4400, 4300 and 4200 controllers do not support the Specimen Protect feature in the **Control Panel** dialog box. Consequently this area of the dialog box does not appear.

- 4400, 4300 and 4200 controllers do not support the features in the **Chart**, **Recorder**, and **Digital Lines** dialog boxes. Consequently, these tabs do not appear in the dialog box.

For information about the Console, press F1 to open the online help and double-click on the Console book in the Table of Contents.

Console for 5800, 8800, 8800Mini systems

The Console for these controllers is very different to that for the 5900, 5500, 4400, 4300, 4200 and 3300 controllers.

For information about the Console, press F1 to open the online help and double-click on the Console book in the Table of Contents.

Status bar

The status bar appears at the bottom of every screen and provides information about the status of the testing system.

Security

There are three security states.

Status	Description
Security off	Security is disabled.
No user	Security is enabled but no user is logged on.
User name	Security is enabled and displays the name of the user currently logged on.

Machine status

This area shows the status of the machine:

Status	Description
Live machine	The computer running the software is connected to a testing machine.
No machine	The computer is not connected to a testing machine and demonstration mode is not enabled.
Demo	The computer is not connected to a testing machine and demonstration mode is enabled.

In the **No machine** state, you can do everything in the software except run tests on specimens. In the **Demo** state, the system uses data files to simulate testing specimens. Refer to the "System Preferences" on page 3-6 for more information about demonstration mode.

Sample

This area provides information on the sample:

Status	Description
Sample: Closed	No sample is open.
Sample name	Indicates the sample that is open. An asterisk after the name indicates there are unsaved changes to the sample.

Refer to "How the system creates a sample" on page 7-5 for more information about methods and samples.

Method

This area provides information on the test method:

Status	Description
Method: Closed	No method file is open.
Method:	You are creating a new method file but have not named it.
	or
	You continue testing specimens in a sample. The system saves the test parameters with the sample so there is no link to the test method. The status bar indicates that no test method is open.
Method name	Indicates the method file that is open. An asterisk after the name indicates there are unsaved changes to the method.

Refer to "How the system creates a sample" on page 7-5 for more information about methods and samples.

Report

This area provides information on the report template:

Status	Description
Report: Closed	No report template file is open.
Report:	A new report template is open but is not named yet.
Report name	Indicates the report template that is open. An asterisk after the name indicates there are unsaved changes to the report.

Progress messages

When the system performs a task that involves a sample, method or report template file, a progress message appears in the appropriate status bar area. Typical messages include "Opening" and "Saving". The message "Generating" appears in the Report area when the system is generating a report.

Navigate between tabs

Depending on the button that you choose on the **Home** screen, various tabs appear and are available. The following sections describe which tabs are available within each tab.

Test tab

*If security is enabled, only Managers and Administrators have access to the **Method** tab and **Report** tab. Refer to "Security reference" on page 7-2 for more details.*

The **Test** button on the **Home** screen opens all four tabs (**Test**, **Method**, **Report**, **Admin**). To move between tabs just click on the tab name. You can move freely between tabs at any time, except when a test is running. When a test is running you cannot leave the **Test** tab.

Method tab

*If security is enabled, only Managers and Administrators have access to the **Method** tab. Refer to "Security reference" on page 7-2 for more details.*

The **Method** button on the **Home** screen opens three tabs (**Method**, **Report**, **Admin**). To move between tabs just click on the tab name. You can move freely between tabs at any time.

Report tab

*The **Report** tab is only available if you purchased the optional Reports and Graphs Pack.*

*If security is enabled, only Managers and Administrators have access to the **Report** tab. Refer to "Security reference" on page 7-2 for more details.*

The **Report** button on the **Home** screen opens two tabs (**Report**, **Admin**). To move between tabs just click on the tab name. You can move freely between tabs at any time.

Admin tab

*If security is enabled, only Administrators have complete access to the **Admin** tab. Operators and Managers have limited access to this tab. Refer to "Security reference" on page 7-2 for more details.*

The **Admin** button on the **Home** screen opens only the **Admin** tab. This tab is where you configure various components of the system, set the system preferences, manage the security features, and view the system information.

The **Admin** tab is available from all the other tabs.

Ways to get help

ToolTips

Move the mouse over a control on the screen. If there is a ToolTip available, it appears in a text box and provides a brief description of that control.

Questions and answers - The Tips pane

The Tips pane provides answers to a number of questions that you might ask on a particular screen. Click on a question and its answer appears below it. Click on the question again to hide the answer.

Online reference help

All screens in the software have a context-sensitive link to the online reference help file. Open the reference help by either pressing the F1 key or clicking the **?** button in the top right hand corner of the Tips pane. The reference help opens at a topic describing the current screen. Use the Table of Contents or any links within the topic to go to other topics in the help file.

In the same pane as the Table of Contents, there are several additional tabs:

• Index - look for topics based on keywords in the index

• Search - look for a word or phrase anywhere in the help system

• Favorites - add topics that you may visit frequently

Product documentation

Instron® offers a comprehensive range of documentation for its products. Depending on what you purchased, the documentation may include some or all of the following:

Operating Instructions	How to use the system components and controls, procedures for setting limits, calibration and other frequently performed operating tasks.
System Reference	A collection of manuals, providing detailed reference information about system installation, the load frame, controller (set up and configuration), transducer connection and calibration, and firmware commands.
Software Reference	How to set up and run tests using Instron® software applications, and screen reference information.
Online Help	Software products come complete with context sensitive help, which provides detailed information on how to use all software features.
Accessory Equipment Reference	How to set up and use Instron accessories such as grips, fixtures, extensometers, transducers, hydraulic power units, non-standard actuators, and environmental chambers.

The software includes many of these documents upon installation.

To find software related help:

1. Click on the Windows **Start** button.

2. Select **All Programs > Instron > Help > Bluehill Help** to find links to various PDF files.

All other manuals included with the system are dependent on the type of system purchased (e.g. operating instructions, accessory equipment manuals) and are printed manuals.

We welcome your feedback on any aspect of the product documentation. Please email info_dev@instron.com with your comments.

Document conventions

Instron® uses the following conventions in its documentation:

	Warning icons	Indicates the potential for personal injury or death.
	Caution	Indicates a potential hazard that may cause equipment damage or loss of data.
	Note	Indicates important information to better understand the testing system.
	Tip	Provides alternatives for performing a task.
Bold Print	**Software control**	Identifies a software control (either a screen title, section heading or a field) in which you can make a selection.
>	**Navigation**	Indicates navigation through multiple levels of menus or options.

Release notes

The release notes are available only in English.

To find release notes:

1. Click on the Windows **Start** button.

2. Select **All Programs > Instron > Help > Bluehill Release Notes**.

Documentation for programmers

These documents are available only in English.

To find programming documentation:

1. Click on the Windows **Start** button.

2. Select **All Programs > Instron > Help > Bluehill Help** to find links to the following documents:

   • Bluehill® API (Advanced Programming Interface) Programmer's Reference

   • Bluehill® Database Reference - describes the structure of the exported results database

Product support

Instron® Support Services offers comprehensive support of your testing system. To contact them via the website or obtain contact information, click on the Instron logo in the software or press F1 to open the online reference help and click on the Instron logo in the online reference help.

Chapter 2
How To

This section provides instructions for common tasks:

Change your password

1. Click **Admin** on the **Home** screen.

   If a sample or method file is open, click the **Admin** tab.

2. Click **My Settings** in the navigation bar.

3. Click **Change password...**.

4. Enter your existing password, your new password and verify the new password.

5. Click **OK** change your password.

Create or modify a test method

*If security is enabled, only Managers and Administrators have access to the **Method** tab. Refer to "Security reference" on page 7-2 for more details.*

1. Click **Method** on the **Home** screen.

   If a sample or method file is open, click the **Method** tab and proceed to Step 3.

2. Open a test method file. Refer to "Open a test method file" on page 4-3.

3. In the **Method** tab, click on each item in the navigation bar to modify the test method parameters. Refer to "Edit a test method" on page 4-5 for more details.

4. Click **Save As** to name your test method file.

   To overwrite the original method file, click **Save**.

   If security is enabled, the system saves your user name as the method author.

*If you have a sample open and modify the test parameters from the **Method** tab, only the **Save As** button is available.*

5. If necessary, click **Print** to print a copy of the method parameters.

What you have at the end:

A test method file in the location that you specified. You can use that test method to run tests on specimens.

Create or modify a prompted test method

*If security is enabled, only Managers and Administrators have access to the **Method** tab. Refer to "Security reference" on page 7-2 for more details.*

1. Click **Method** on the **Home** screen.

   If a sample or method file is open, click the **Method** tab and proceed to Step 3.

2. Open a test method file. Refer to "Open a test method file" on page 4-3.

3. In the **Method** tab, click on each item in the navigation bar from **General** to **Reports** to view and modify the test method parameters. Refer to "Edit a test method" on page 4-5 for more details.

4. Click **Test Prompts > Prompt Sequence** in the navigation bar. Check **Run as a Prompted Test** and choose which prompted test screens you want to display for the test sequence. Refer to "Test Prompts menu items" on page 4-68.

   As you check each box, an item appears in the navigation bar under **Test Prompts**.

5. Click on each item in the navigation bar under **Test Prompts** to set up the parameters for each step in the test sequence.

6. Click **Save As** to name the test method file.

   To overwrite the original method file, click **Save**.

If security is enabled, the system saves your user name as the method author.

*If you have a sample open and modify the test parameters from the **Method** tab, only the **Save As** button is available.*

7. If necessary, click **Print** to print a copy of the method parameters.

What you have at the end:

A test method file in the specified location that. Use the test method to run prompted tests on specimens.

Create or modify a report template

*The **Report** tab is only available if you purchased the optional Reports and Graphs Pack. If you do not have this option, then choose one of the standard report templates from the **Method** tab. Note that you cannot modify it. Refer to "Setup Document Outputs" on page 4-61.*

*If security is enabled, only managers and administrators have access to the **Report** tab. Refer to "Security reference" on page 7-2 for more details.*

1. Click **Report** on the **Home** screen.

   If a sample or method file is open, click the **Report** tab and proceed to Step 3.

2. Open a report template file. Refer to "Open a report template file" on page 6-5.

3. In the **Report** tab, click on each item in the navigation bar to modify the parameters in the report template. Refer to "Edit a report template" on page 6-3 for more details.

4. Click **Save As** to name the report template.

   To overwrite the original report template, click **Save**.

What you have at the end:

A report template file in the specified location.

Perform a test

You must select a test method file and create a sample to save the test data. The test method contains the test parameters that the system applies to each specimen in the sample. Example test methods are provided with the software.

To create a sample and perform tests:

1. Click **Test** on the **Home** screen.

2. Choose a test method file. Refer to "Create a new sample" on page 5-2 for more details. Click **Next**.

3. Enter a name and choose a location (or accept the ones generated for you) for the sample data file. Refer to "Name the new sample" on page 5-4 for more details. Click **Next**.

   The **Test** tab displays.

4. Run a test for each specimen in the sample. Refer to "Test workspace" on page 5-6 for more details.

5. Click **Finish Sample**. Refer to "Finish a sample" on page 5-28 for more details.

If security is enabled, the system saves your user name as the sample author.

What you have at the end:

- A sample in the specified location.

  The default location is:

Operating System	Default Location for Output Files
Windows XP	`C:\Documents and Settings\All Users\ Shared Documents\Instron\Bluehill\Output`
Windows Vista	`C:\Users\Public\Documents\Instron\ Bluehill\Output`
Windows 7	`C:\Users\Public\Documents\Instron\ Bluehill\Output`

  The sample contains the test parameters from the original test method file and the data collected during tests.

- The output that is specified in the test method. The output files are determined in the **Reports** section of the **Method** tab and can include reports, exported results, and exported raw data files. The system saves the output files in the same location as the sample file. Refer to "Reports menu items" on page 4-61.

What you can do with the saved sample:

The following features are available for saved samples.

Test more specimens in the sample

1. Open the saved sample using **Continue Sample**.

2. Add more specimens and continue testing.

3. Click **Finish Sample** to save the sample and generate a new set of document outputs.

Refer to "Continue testing a sample" on page 5-5.

Fix errors in parameter values

If there is an error in a parameter value:

1. Open the saved sample using **Continue Sample**.

2. Select the specimen and enter the correct value in the **Test Inputs** area.

3. Recalculate the results.

4. Click **Finish Sample** to save the sample and generate a new set of document outputs.

Refer to "Setup Test Prompts - Test Workspace Screen" on page 4-77 to set up the Test Inputs area.

Add more results

To add a result to the test data:

1. Open the saved sample using **Continue Sample**.

2. Select the **Method** tab and add the result to the results table. You may need to also add a calculation to the method.

3. Select the **Test** tab again.

4. Recalculate the results.

5. Click **Finish Sample** to save the sample and generate a new set of document outputs.

Refer to "Setup Calculations" on page 4-34.

Print the report

Click **Print** on the test workspace or go to the **Report** tab and click **Print**.

If the report is saved in PDF, MS Word or HTML format, you can print the saved report file without using the Bluehill® software. Refer to "Setup Document Outputs" on page 4-61.

Chapter 3
The Admin Tab

The **Admin** tab is where you configure various components of the system, set the system preferences, manage the security features, and view the system information. This section contains the following topics:

Overview of the Admin tab

Use the **Admin** tab to configure various components of the system, set the system preferences, manage the security features, and view the system information. Most of the system configuration occurs when you initially open the software. The configuration screens are available to add accessories to the system or change the system settings.

The **View the System Information** screen displays all the version information and system identification numbers for the testing system.
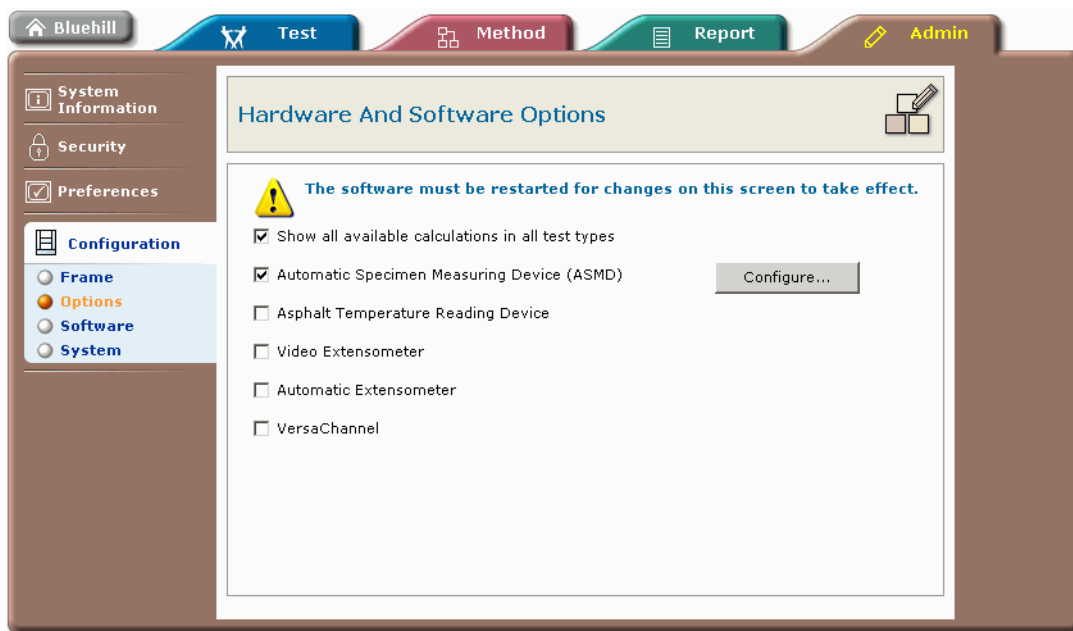
Figure 3-1.   Admin Tab

Security access

The **Admin** tab and most of its contents are always available. Some screens are only accessible to an administrator in the security system. Refer to "Security reference" on page 7-2 for more details about setting up security and what screens are available for each security level.

Navigate within the Admin tab

Click on an item in the navigation bar on the left side of the screen to display the appropriate contents for that selection.

The status bar at the bottom of the screen shows the status of the testing system and displays the files that are currently open.

View System Information

This screen displays all the information about the system and is a reference page if you need to contact Instron® customer service. To get to this screen, click on the **Admin** tab, followed by **System Information** in the navigation bar.

You cannot change any of the values or settings from this screen. To change the values shown, go to the **Preferences** or **Configuration** screens within the **Admin** tab.

In some configurations, some information does not display. For example, if you have not set up the email feature, the **Outgoing mail server (SMTP)** property does not display a value.

My Security Settings

This screen displays your user profile settings. You can also see your rights to delete specimens and to change specimen parameters after they have been tested.

Click **Change Password...** to change your password.

Most of this screen is for viewing only. To change your settings, ask your administrator to change your profile.

Setup Security

This screen is where an administrator can enable the security feature, create user profiles and set up privileges for each user.

Important - The Instron® user profile that is supplied with the software has administrator rights and can do anything in the software. After you set up all of the users, and at least one of them has administrator rights, you should log in as one of the new administrator users and delete the INSTRON user. If you do not, anyone can use INSTRON to log in with administrator rights.

The screen contents vary depending on the status of the security system (on or off) and your security rights. Refer to "Security reference" on page 7-2 for a summary on the security access rights.

To enable the security feature, log in as a user with administrator rights.

Enable the security feature

1. Click **Admin** on the **Home** screen. If a sample or method file is open, click the **Admin** tab.

2. Click **Security > Setup** in the navigation bar.

3. Select **Security on**.

    A **Log in** dialog box displays.

4. Log in as a user with administrator rights.

    If you have not set up any user profiles, use the Instron® user profile included with the system:

User:	INSTRON
Password:	INSTRON

    User names and passwords are case-sensitive.

    When you successfully log in as an administrator, all of the fields in the **Setup Security** screen display and you can create or modify user profiles.

Set the password expiration

If you want users to change their passwords regularly, set a password expiration that applies to all users.

1. Click **Admin** on the **Home** screen. If a sample or method file is open, click the **Admin** tab.

2. Click **Security > Setup** in the navigation bar.

3. Check **Password expiration**.

4. Enter the number of days before a password expires in the associated field.

Create a user profile

Refer to "Security reference" on page 7-2 for more information on the various profile settings.

1. Click **Admin** on the **Home** screen. If a sample or method file is open, click the **Admin** tab.

2. Click **Security > Setup** in the navigation bar.

3. Click **Add...**. The **Setup User** dialog displays.

4. Type in a user name.

5. Choose the security level.

6. Enter a password for the user.

7. Check one or both of the privileges to let the user have those rights.

8. Click **OK** to create the user.

Modify a user profile

1. Select the user name.

2. Click **Modify...**. The **Setup User** dialog displays the current settings for that user.

3. Make the changes to the user profile.

4. Click **OK** to save the changes.

When you modify a user profile, the password expiration for that user is reset. If the password expiration is set to 10 days and the user's password expires in 6 days, the password would be reset to 10 days from the time that you modified the user's profile.

Edit user privileges

When editing a user profile, you can set the privileges for that user. The different privileges include:

- delete specimens
- change tested specimens

Delete specimens

Check this box to allow the user to delete specimens from a sample. If this box is unchecked, the user cannot delete specimens from a sample.

Change tested specimens

Check this box to allow the user to change values for tested specimens. If this box is unchecked, the user cannot change these values after a specimen is tested.

Remove a user profile

1. Select the user name.

2. Click **Remove**.

Restrictions on modifying and deleting users

The system prevents you from accidentally deleting your profile or reducing your privileges. If you highlight your own user name, the **Delete** button is grayed. Similarly, if you highlight your user name and click **Modify...**, the **Level** field is grayed.

System Preferences

This screen lets you choose how you want the software to start and lets you choose to run the software in Demonstration Mode. Open this screen from the **Admin** tab by selecting **Preferences > System** in the navigation bar.

Start-up default

Many users will be content with the default choice for this setting, the **Home** screen. However, if this testing system is to be used exclusively for running tests, using one of only a few test methods, you may want to choose one of the other options. Even if you choose one of the other options, you can always get back to the **Home** screen at any time.

At the Home screen

This is the default choice. When the software starts, it opens at the **Home** screen and you must click one of the buttons on that screen to proceed.

Ready to test with the last-used test method

When the software starts, it opens the last test method that was used in the previous testing session and moves directly into the testing mode. The first interaction with the user is to prompt for a filename to store test data. When this is complete, you can start testing specimens.

Ready to test with a specific test method

When the software starts, it always opens the same test method, specified by you, and moves directly into the testing mode. The first interaction with the user is to prompt for a filename to store test data. When this is complete, you can start testing specimens.

Work in Demonstration mode

You do not need to check this box; Demonstration mode lets you simulate running tests on specimens when there is no frame connected to the software.

When you start the software, it detects any frame that is connected to the computer. If no frame is connected, the software runs in "standalone" mode. This lets you do everything except run tests on specimens.

If this box is checked and there is no frame connected to the computer, the software prompts you to choose a raw data file from which it creates demonstration test data. This data is then used whenever you click on the **Start Test** button, simulating the testing of a specimen.

This mode is used most frequently by Instron® sales personnel to demonstrate the capabilities of the software in the absence of a frame.

The test data files that you choose for Demonstration mode can be distinguished from other test data files by their filename extension, as follows:

Test type	Test data file extension	Equivalent demonstration data file extension
Asphalt	id_asphalt	demo_id_asphalt
Tension	id_tens	demo_id_tens
Compression	id_comp	demo_id_comp
Flexure	id_flex	demo_id_flex
Tension Creep Relaxation	id_trelax	demo_id_trelax
Compression Creep Relaxation	id_crelax	demo_id_crelax
Flexure Creep Relaxation	id_frelax	demo_id_frelax
Peel, Tear and Friction	id_ptf	demo_id_ptf
Tension Profile	id_tcyclic	demo_id_tcyclic
Compression Profile	id_ccyclic	demo_id_ccyclic
Metals	id_metal	demo_id_metal

When you run tests using these demonstration data files, you create test data files that are the same as those that would be created if you were running real tests.

Specify your company logo

If you selected **Logo** to display in the header or footer of your report template, you can identify your company logo in this section. To identify, or change, the graphic file in the **Picture file:** field, click **Change...** to open a dialog box from which you can browse to the graphic file. The default path is to My Pictures folder.

To display your company logo on the Home screen, select **Display on the Home screen**.

Export File Settings

This screen provides the settings for the results and raw data export file formats. The type of format is selected in the **Method** tab, under **Reports > Export Results** and **Reports > Export Raw Data**.

Access database settings

1. Click **Admin** on the **Home** screen. If a sample or method file is open, click the **Admin** tab.

2. Click **Preferences > Export files** in the navigation bar to display the **Export File Settings** screen.

3. Select the format and location to create the database.

Format

At present there is only one available database format, MS Access (.MDB).

Output path

Type the path directly in the field, or click **Browse...** to navigate to the location where you want to create the database.

Comma separated values settings

1. Click **Admin** on the **Home** screen. If a sample or method file is open, click the **Admin** tab.

2. Click **Preferences > Export files** in the navigation bar to display the **Export File Settings** screen.

3. Select **Enclose numbers with quotes** to include quotes around the numbers in the output files.

Email Preferences

To send a test report by email to one or more recipients, you must set up the email function on the **Email Preferences** screen. Open this screen from the **Admin** tab by clicking on **Preferences > Email** in the navigation bar.

If the Bluehill® security is enabled, you must be an administrator to access this page.

Set up the email message and recipients of the report from the **Setup Document Outputs** screen in the **Method** tab. This allows the system to automatically send the report to the designated recipients when you finish a sample.

The email function requires the following information:

Outgoing mail server (SMTP)	Specify the outgoing mail server. For example, if you are using Microsoft Outlook, this field should contain the name of the Microsoft Exchange Server for your email system.
Port	The server port number for the outgoing mail server.
User name	A designated user name on the mail server for the Bluehill® system.
Password	A password for the Bluehill® system.
Sending address	An email address for the Bluehill® system.

The above information enables your company's email server to accept and forward mail from the Bluehill® system.

Frame Configuration

This screen lets you set up your frame and its controller.

The first time you start the software, this screen appears as part of a wizard to let you choose the settings for your system. Subsequently, you open this screen from the **Admin** tab by clicking on **Configuration > Frame** in the navigation bar.

You only need to visit this screen if your system hardware changes.

Controller type

Different controller types have different capabilities. The console displayed at the top of the screen is different for different controller types. You must choose the controller type that matches your system.

*If you change the **Controller type** in this screen, all the settings in the **Hardware and Software Options** screen are reset to their default settings.*

GPIB address

This field appears when you choose certain controller types that use the GPIB to communicate with the frame. In most cases, the software selects the correct GPIB address for your controller. You should not change this setting unless advised to do so by a service engineer or technical support.

The default GPIB addresses for different controller types are as follows:

Controller Type	GPIB address
4200, 4300, 4400	4
5800, 8800, 8800Mini	3
ElectroPuls	1

Frame serial number

Enter the frame serial number here so that you have it readily visible to you if you ever need to contact technical support. The frame serial number is one of a set of numbers that are used by Instron® to determine what service contract or warranty may be in force for your system.

Refer to "System ID reference" on page 7-22 to locate the serial number on your frame.

Frame model

Choose the **Frame model** number that matches your frame. If your system uses a frame that is not a standard model, you will have an additional disk containing a file (custom.asc) for the configuration of that frame. If this is the case, you must select **Custom** from the

Frame model list and follow the instructions that appear prompting you to insert the disk containing the custom.asc file.

Interface type

This field appears when you choose certain controllers. Select the type of connection used to establish communication between the system computer and your frame. The options include Ethernet and PCI digilink. To determine which connection your system uses, refer to the installation section of your frame reference manual or contact the Instron® Service department.

The Ethernet connection requires a dedicated network card and a crossover Ethernet cable. If your system is connected to your office network, then the computer needs a second network card that is used solely to communicate with the frame.

To ensure continuous, and faster, communication between the computer and the Ethernet Frame Interface, you must manually set the IP address for the dedicated network card. Your IS department can assist you with setting this IP address.

The recommended settings for the Ethernet Frame Interface and the dedicated network card are:

	Default Settings for the Ethernet Frame Interface	Dedicated Network Card for the Computer
IP address:	169.254.1.1	169.254.1.2
Port:	48362	

MAC address

This field appears when you select Ethernet for the Frame Interface type. This type of connection requires an Ethernet Frame Interface, which has a unique MAC address. The software uses the MAC address to verify the Ethernet Frame Interface as part of the system. The number entered in this field must match the MAC address on the Ethernet Frame Interface in order to establish communication with the frame.

Hardware and Software Options

This screen lets you set up any hardware accessories that are part of your system. It also allows you to change the number and type of calculations that are available for different test types.

*If you change the **Controller type** in the **Frame Configuration** screen, all the settings in this screen are reset to their default settings.*

The first time you start the software, this screen appears as part of a wizard to let you choose the settings for your system. Subsequently, you open this screen from the **Admin** tab by clicking on **Configuration > Options** in the navigation bar.

You only need to visit this screen if you purchase additional accessories.

Show all available calculations in all test types

This box is normally unchecked, which means that only those calculations that are relevant are shown in the list of calculation libraries (refer to the Instron$^{®}$ Calculations Reference manual). For example, Average Value calculations are normally shown only in the Peel, Tear and Friction test type.

If you check this box, all the calculations for all the test types that you have purchased are made available for any test type that you use.

Automatic Specimen Measuring Device (ASMD)

Check this box if you have an Automatic Specimen Measuring Device connected to your system. You must then restart the software, come back to this screen, and click on the Configure... button to set up the hardware.

Automatic extensometer

Check this box if you have any type of automatic extensometer connected to your system. When you check the box an extra field appears to let you choose which type of extensometer you are using.

HRDE is the High Resolution Digital Extensometer.

Digital MA is the Digital Metals Automatic Extensometer.

Video extensometer

Check this box if you have any type of video extensometer connected to your system. When you check this box, a message appears asking you if you have a video configuration file. Some video extensometers are supplied with a configuration file. If you answer **Yes** to this, an **Open File** dialog displays to let you browse for the file.

When you answer all the prompts regarding the configuration file, an extra field appears to let you choose which type of extensometer you are using.

- Choose **Video** if you have an old (pre-2004) Standard Video Extensometer (also known as Type 3).

- Choose **AVE/SVE** if you have an Advanced Video Extensometer or the Standard Video Extensometer (post-2004).

The AVE and SVE have their own separate installation and the **AVE/SVE** choice does not appear in the list of options if you have not installed one of them.

VersaChannel

The VersaChannel checkbox appears only if you purchased the VersaChannel option.

Check the **VersaChannel** box if you want to configure additional channels for your testing system.

When you check the **VersaChannel** box the user interface changes as follows:

- an extra field (**Board type**) appears below the checkbox
- an extra item (**VersaChannel**) appears under **Configuration** in the navigation bar

At present only one board type is supported for VersaChannel, so the **Board type** list contains only one item.

When you have enabled VersaChannel in this screen you need to go to the **VersaChannel Configuration** screen to specify the number of channels and set them up.

Software Configuration

This screen only appears in the software if you purchased multiple software configurations.

Instron® supports different configurations of Bluehill® software; each configuration delivers specific features to support various customer needs. Examples of software configurations are Bluehill or Bluehill Lite.

If you have purchased multiple configurations of this software, this screen lets you reconfigure the software to any one configuration that you have purchased.

Only the configurations that you have purchased are available and thus are shown on this screen.

How does it work?

Open this screen from the **Admin** tab by clicking on **Configuration > Software** in the navigation bar.

This screen displays the current configuration that is operating. To change the configuration, select any one of the configurations listed on this screen and restart the software. The software closes and restarts again in the selected configuration.

Note that different configurations vary between the controllers, methods and features that are available. Method and samples created in one configuration may not be available in other configurations. If you need a specific method file that was created in another configuration, you may need to create a new method file based on the features available with your current configuration.

System Configuration

The first time you start the software, this screen appears as part of a wizard to let you choose the settings for your system. Subsequently, you open this screen from the **Admin** tab by clicking on **Configuration > System** in the navigation bar.

You do not need to visit this screen after the initial setup of your system. You only need to visit it if you purchased additional software options.

Key code

This field displays the key code that was entered during installation. In combination with the system ID number, this determines the software functions and features that you purchased. For example, it determines which test types you can use. If you purchase additional test types after the initial installation of the system, you may be provided with a new key code which you can enter here to give you access to the additional features that you purchased. In normal use, however, you should never need to change this number.

The original key code is supplied on the cover of the software CD case. If you lose this or any other key code that has been supplied, contact technical support.

System ID

This number is entered by an Instron® Service Engineer as part of the initial installation. Since this number works in conjunction with the key code, this field is read only and it cannot be changed. The system ID number can be found on the system frame and the software CD case.

Refer to "System ID reference" on page 7-22 to see where the system ID number is located on your frame.

Control number

This number is normally entered by an Instron® Service Engineer as part of the initial installation. If for any reason you erase this number and cannot recover it, contact technical support.

Agreement number

This number is normally entered by an Instron® Service Engineer as part of the initial installation. If for any reason you erase this number and cannot recover it, contact technical support.

VersaChannel configuration

This screen lets you set up additional channels for your testing system using the VersaChannel feature.

*This screen displays only when you enable VersaChannel in the **Hardware and Software Options** screen. The VersaChannel feature is a separate hardware and software option.*

When you create additional channels in this screen, a new button appears in the **Console** area of the software. This button opens a setup dialog box that lets you calibrate and balance each of the transducers connected to the additional channels. The dialog contains a drop down list with the names of each of your channels and you can work on each of them in turn in this setup dialog.

Board identifier

This value identifies the board that is installed in your computer. You can set it to a value between 1 and 10. In most cases the default value of 1 is the correct value.

The National Instruments DAQmx driver can be used with a number of different National Instruments boards, each with a different "index", or board identifier. If you are unsure of the correct value, you can run the NI MAX utility to determine the index of your board.

Transducer mode

You can set this to **Single-ended** or **Differential**, according to your needs.

Be sure to set this field before you set up any channels in the list below it. When you change your choice in this field, all the settings for the channels in the list are reset to their default values.

Number of channels to use

The maximum number of channels depends upon the option that you have purchased and your setting for **Transducer mode**, as follows:

- the 4-channel option provides a maximum of 4 channels single-ended, 2 channels differential.

- the 16-channel option provides a maximum of 16 channels single-ended, 8 channels differential.

You should set this number to the maximum number that you will need to use, as you can individually set the connection status of each transducer when you set it up in the **Extra Transducer Setup** dialog in the **Console** area of the software.

Channel list

The channel list reflects the number of channels that you have specified.

When you highlight a channel in the list, its settings appear to the right of the list.

Channel settings

The fields within this area let you set up the **Name**, **Type** and **Range** for each channel. The software assigns a unique identifier (independent of the name that you enter) to each of these channels and it is this identifier that is saved when the channel is used in any part of a test method.

You may want to include information about the channel settings in the **Sample Description** field so that you can be sure that any method or sample is compatible with the configuration of any testing system that runs it.

Name

The default name is the channel number. You can enter any name here, up to a maximum of 25 characters.

Type

There are three types; **Load**, **Strain** and **User**. If you choose **User**, an extra field appears that lets you specify units for the user transducer. The **Units** field is a text field and can contain up to 10 characters. If you choose **Load** or **Strain**, the units are those that you have set up for the system.

Input range

The default input range for a transducer is -10V to +10V. However, if your transducer operates over a smaller voltage range, the resolution for the transducer is degraded if you use the default range. For each transducer, therefore, you need to choose the appropriate range in this field.

Web Camera Configuration

This screen lets you add a web camera to your system configuration and set the compression filter for the selected web camera. The web camera video feature is only available if you have a valid key code that enables this feature.

How does it work?

The first time you start the software, this screen appears as part of a wizard to let you choose the settings for your system. Subsequently, you open this screen from the **Admin** tab by clicking on **Configuration > Web Camera** in the navigation bar.

You do not need to visit this screen after the initial setup of your system. You only need to visit it if you need to change the camera or change the filter setting.

Once the system is configured for a web camera, you must create, or change, a test method that enables the recording feature so the system can collect video data as part of the sample.

If you want to include the video display on the test workspace, you can customize the test workspace using the advanced layouts feature in the **Method** tab.

Video source

If this field is empty, then you must first install the drivers for the web camera onto the system computer. Refer to the web camera installation instructions and complete all installation instructions to ensure that the camera works properly with this software.

The web camera must also be connected to the system computer.

The **Video source** field lists only web cameras that are installed and connected to the system's computer. Note that the software only displays web camera drivers that are compliant to WDM (Windows Driver Model).

Compression filter

When saving video files, the compression filter lets you reduce the size of the video files. In this field, you can select either **No compression** or any one of the filters listed in this field.

When you use a test method with the Web camera enabled for recording, the video files are saved when you save the sample. The video files are saved using the compression filter that you select in this field.

Chapter 4
The Method Tab

The **Method** tab is the primary location for editing test parameters and creating new methods. Some parameters can be changed from the **Test** tab, but the **Method** tab is the only place with complete access to all test parameters.

This section describes how to edit a test method and provides detailed information on each screen found within the **Method** tab. It contains the following topics:

Overview of the Method tab

*If security is enabled, only managers and administrators have access to the **Method** tab. Refer to "Security reference" on page 7-2 for more details.*

The **Method** tab is the primary location for editing test parameters and creating new methods. This tab displays when you:

- open a method file to create or modify it. Refer to "Open a test method file" on page 4-3.

- open a sample or create a new sample. Click the **Method** tab to edit the method file that is linked to the sample.
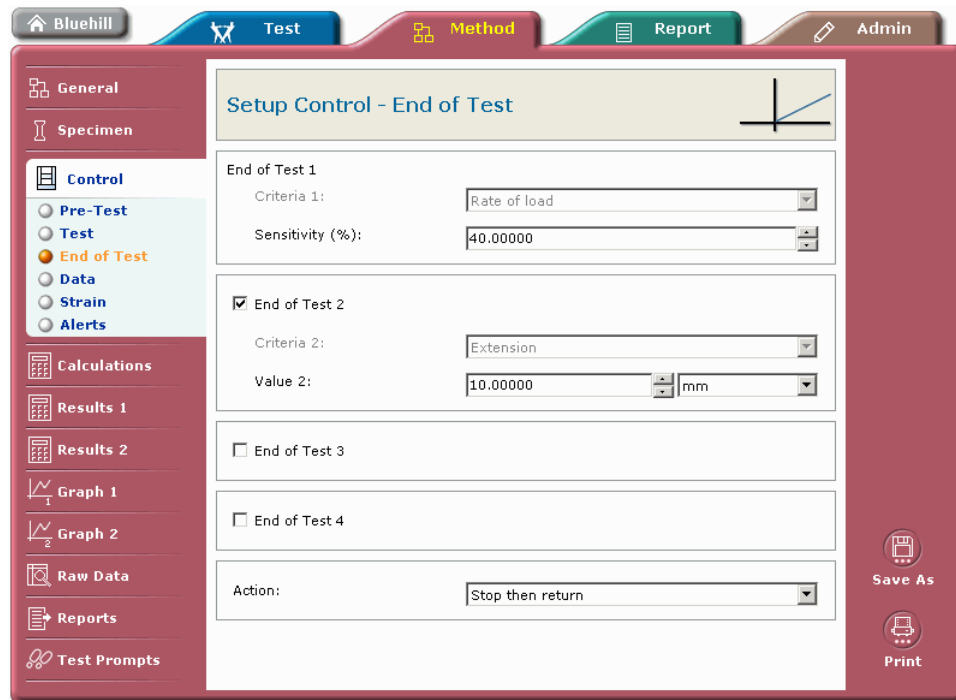
Figure 4-1.   Method Tab

Navigate within the Method tab

Click on an item in the navigation bar on the left side of the screen to display the appropriate contents for that selection.

Refer to "Edit a test method" on page 4-5 for additional information on the **Method** tab.

The status bar at the bottom of the screen shows the status of the testing system and displays the files that are currently open.

Tabs available from the Method tab

Test	[Only available when there is a sample open]. Click this tab to go to the test workspace. Any changes made to parameters in the **Method** tab are implemented.
Report	Click this tab to edit the report template that is linked to the current test method. To link to another report template, open a different report template and link it to the current test method.
Admin	Click this tab to change the system configuration. An administrator can also change the security settings.

Buttons available in the Method tab

Save & Close	[Not available when there is a sample open]. Click this button to save the current test method and open another one for editing. All the current test parameters are saved back to the same file. The original test method file is overwritten and you return to the **Open Method** screen to open another test method.
Save	[Not available when there is a sample open]. Click this button to save all the current test parameters back to the same file. The original test method file is overwritten. If you created a new test method, this button behaves as a **Save As** button. Give the file a new name because there is no original file to overwrite.
Save As	Click this button to open the **Save As** dialog and save the current test parameters to a new file name. Any original file is not overwritten.
Print	Click this button to print a copy of all the current test parameters.

Open a test method file

From the **Home** screen, click **Method**.

The screen consists of a **Most Recently Used** list, a **Preview** area and three buttons (**Open**, **Browse...** and **New...**) on the right side of the screen. You can either:

- create a new method.

- browse to open an existing method.

- select a method shown on the Most Recently Used list.

Create a new method file

1. Click **New...** to open the **Create a New Test Method** dialog box.

2. Select a test type and click **Create**.

   The system creates a new method and all the values are set to the system default values for the selected test type.

3. Proceed through the navigation bar and edit the method parameters required for your testing needs. Refer to "Edit a test method" on page 4-5.

Open an existing file

1. Click **Browse…** to open an **Open File** dialog box.

2. Find the file and click **Open**.

   The system opens the file and advances to the appropriate tab in the software.

   Click **Cancel** to close the dialog box.

If the file does not open, the system displays an open file error message. Refer to the online help for further assistance.

Using the Most Recently Used list

1. Click on the name. The file name and its path appear in the associated fields and a preview of the file displays in the **Preview** window.

2. Click **Open** to open the file and advance to the appropriate tab in the software.

Double-click a file name in the list to open it.

Managing the Most Recently Used list

The **Most Recently Used** list displays the most recently used file at the top of the list. To sort the files differently, click any of the other column headings.

Right-click on a file name in the **Most Recently Used** list to display a context menu with the following items:

Open file	Opens the selected file.
Reset order	Resets the order of files in the list to the default order, with the most recently used at the top.
Remove from MRU list	Removes the selected file from the list.
Clear MRU list	Removes all files from the list.

First time use

The first time you visit this screen, the **Most Recently Used** list is empty. If you click **Browse...** to display the **Open File** dialog box, the default location is also empty because you haven't yet created any test method files.

To open one of the Instron® method templates, click **Browse...** to find the default location for the Instron Examples folder. Use one of the method templates as a starting point to create your own method and save it with a new name.

Operating System	Default Location for Instron Examples Folder
Windows XP	`C:\Documents and Settings\All Users\ Shared Documents\Instron\Bluehill\Templates\ Instron Examples`
Windows Vista	`C:\Users\Public\Documents\Instron\ Bluehill\Templates\Instron Examples`
Windows 7	`C:\Users\Public\Documents\Instron\ Bluehill\Templates\Instron Examples`

Return to the Home screen

To return to the home screen, click .

Edit a test method

*If security is enabled, only managers and administrators have access to the **Method** tab. Refer to "Setup Security" on page 3-3 for more details*

The **Method** tab is the primary location for creating a test method and editing test parameters. You can change some parameters from the **Test** tab, but the **Method** tab is the only place where you have access to all test parameters.

To edit a test method:

1. "Open a test method file". If a sample is open, click on the **Method** tab.

2. Use the navigation bar to find the test parameters that you need to edit.

The remaining sections in this chapter describe each of the **Method** screens in greater detail.

Restrictions

If you edit test parameters while you have a sample open, there are restrictions on editing some parameters. After one specimen has been tested, you cannot change the following:

*   Geometry

*   All Control mode selections

*   All Channel selections

*   All Changeover criteria

*   All Start and End criteria

*   Extensometer removal criteria

If you are experimenting with different test parameters and want to test one specimen and then change one of these parameters for the next specimen, you can either finish the sample after testing each specimen or you can delete each specimen after it is tested. Only delete the specimen if you do not want to save the data from each specimen.

General menu items

The **General** menu on the navigation bar for the **Method** tab contains the following menu items:

*   Method

*   Sample

*   Basic Layout and Advanced Layout

Setup Method screen

This screen sets up the general parameters, including the system of units, for the method. You can also write a detailed description of the method that you are creating.

How does it work?

Open the **Setup Method** screen in by clicking on **General > Method** in the navigation bar.

System of units

This field sets the base system of units in which the testing system operates.

If you select a single set of units (**SI**, **Metric** or **US Customary**), all the unit fields throughout the software use only that system. You can still change the magnitude of the units within that system.

If you select **All**, then all units are available in every unit field.

Assign specimen parameters

In this field, you can choose how the system selects the default settings for added specimens. Typically, the system uses the default values from the method. These are the default parameter settings entered in the Method tab. This is the **Method default** option.

The **Last tested specimen** option applies the parameter settings from the last tested specimen. If you allow users to enter specific parameter information for a specimen in the Test Inputs area of the test workspace, you can select the **Last tested specimen** option. When the system adds a new specimen to a sample, it automatically enters the specimen parameters, including changes made under the Test Inputs area of the test workspace for the last tested specimen.

The **Last tested specimen** option is helpful if a specific characteristic or parameter of your specimen changes during the sample. For instance, if you need to test half your sample in a dry state while the second half is tested in a wet state. When you change the test input parameter from "dry" to "wet", you only need to make this change once rather than for every wet specimen.

Method description

This field lets you enter text to describe the parameters in the test method. Wherever you select a test method file, the method description displays in the preview area.

Click the [...] to customize this field. If, for example, you prefer the term **Procedure** rather than **Method**, you can change the prompt to **Procedure Description**.

Setup Sample Description and Notes screen

The information that you enter in the **Sample Description** field is stored in any sample that you create using this test method. Wherever you select the sample and can see a preview of it, the **Sample Description** displays at the top of the preview screen.

The three **Sample notes** give you the opportunity to enter comments about the sample.

How does it work?

You open the **Setup Sample Description and Notes** screen in the **Method** tab by clicking on **General > Sample** in the navigation bar.

You can customize any of these fields to your requirements by clicking on the [...] button adjacent to the field that you want to change. If, for example, you prefer the term **Batch** for a collection of specimens rather than **Sample**, you can change the prompt to **Batch Description**.

All of the fields in this screen apply to the entire sample, not to individual specimens within the sample. The **Sample description** and **Sample notes** do not appear in the **Available** list of parameters in the **Setup Test Prompts - Test Workspace** screen because the **Test Inputs** component of the test workspace only contains parameters that apply to individual specimens.

You cannot, therefore, add these fields to the **Test Inputs** component of the test workspace for an operator to enter information while testing. If you enable Security and want a person with only Operator rights to enter information in these fields while testing, you can use the **Setup Prompt Sequence** screen to create a prompted test.

Setup workspace layout

The Layout control lets you choose the components of the workspace and how they are laid out. Most users choose a layout from the Basic control but you can set up a custom layout using the Advanced control.

How does it work?

The control is accessible from a number of different screens:

- In the **Test** tab, right-click anywhere on the workspace area and choose **Layout...** from the context menu. The Layout control displays in the **Layout** dialog box with separate tabs for **Basic** and **Advanced**.

You can see how your chosen layout looks by clicking the **Apply** button. This applies your choice to the workspace beneath the dialog box without closing the dialog box. When you are satisfied with the layout, close the dialog box.

- In the **Method** tab, click on **General** in the navigation bar. The navigation control expands to show **Basic Layout** and **Advanced Layout** options.

If a sample is open, either because you are currently testing or are reviewing a sample, you can go back to the workspace to see the layout you selected.

If there is no sample open, because you are editing a test method, you must first save the test method and then use the method to create a sample before you can see the effect of the changes you have made.

Basic layout

The Basic control lets you choose by clicking one of the icons representing a layout. When you click on an icon it highlights to show that it is selected. If none of the icons are selected, text at the top of the screen indicates that an Advanced Layout has been set up and is being used.

Advanced layout

The Advanced control lets you split the screen how you want it and assign a component to each pane that you create. The components in most systems are a graph, a result table and an area for entering test parameters for individual specimens. Follow the on-screen instructions to create a layout.

Specimen menu items

The **Specimen** menu on the navigation bar for the **Method** tab contains the following menu items:

- Dimensions
- Number Inputs
- Text Inputs
- Choice Inputs
- Notes

Setup Default Specimen Dimensions screen

This screen lets you set up the geometry and enter specimen dimensions for the default specimen.

How does it work?

You open the **Setup Default Specimen Dimensions** screen in the **Method** tab by clicking on **Specimen - Dimensions** in the navigation bar.

Each of the **Specimen Dimension** fields has an associated ⌞…⌟ button. Click on this button to open the **Properties** dialog for the selected dimension. The **Properties** dialog provides fields where you can change the **Prompt** to describe the value that you want to enter and, if required, enter a default value. You also have the option to set bounds for any value, to prevent an operator from entering a value outside of a defined range. Refer to "How do Bounds on parameters work?" on page 7-8 for more details. The **Reset** button in the dialog resets the **Prompt** and **Decimal places** to their system default values and unchecks the **Enable bounds** box. It does not, however, change any values or units that you have set.

If you want your operator to enter different values of a particular dimension for each specimen, you must add that dimension to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. Refer to "Setup Test Prompts - Test Workspace Screen" on page 4-77 for more details.

If you want to run a prompted test, where the operator is prompted to enter values at a particular point in the test sequence, you can set up a prompted test. Refer to "Setup a prompted test sequence" on page 4-69 for more details.

Geometry

When you choose a geometry, an appropriate set of dimension fields appear for you to enter values. The geometry selection also influences which dimensions appear in any **Available** lists in other screens within the **Method** tab. These include the **Setup Test Prompts - Test Workspace** screen and the **Setup Results Table Columns** screen.

Valid geometry types and their associated dimensions for each test type are described in "Specimen dimensions for different geometries and test types" on page 7-9.

Geometry can be added to the list of fields in the Test Inputs component of the test workspace, using the Setup Test Prompts - Test Workspace screen. However, because the choice of geometry affects the display of appropriate dimensions, you cannot change the selection in the Geometry field in the Test Inputs component of the test workspace.

Dimensions

The dimensions that appear in this screen are controlled by your choice of **Geometry**.

Dimensions that you enter here are applied to the default specimen and, if there is a sample open when you are entering these values, are also applied to all untested specimens in the sample.

Fixture type (Flexure test types only)

You must select the type of bend fixture that you are using for your testing and you must enter a value for the support span of the bend fixture. This allows the system to perform calculations correctly.

If you choose a 3-point bend fixture, no additional information is required. However, if you choose a 4-point bend fixture, you must choose a value for the span ratio. If your 4-point bend fixture has a span ratio that is not in the list offered, you can choose **Custom** and enter a value for **Loading span**.

When using a 4-point bend fixture for flexural testing, you should use a deflectometer to measure the specimen deflection directly at the mid-span point on the specimen. You must set up the method to use output from the deflectometer as the Axial Strain Source. If you don't use a deflectometer, the software uses the crosshead extension at the point of contact of the fixture, which may be significantly different from the specimen deflection at mid-span.

Setup Default Number Inputs screen

This screen lets you customize number inputs for the default specimen. Refer to "What is the default specimen?" on page 7-7 for more information on the default specimen.

How does it work?

You open the **Setup Default Number Inputs** screen in the **Method** tab by clicking on **Specimen - Number Inputs** in the navigation bar.

Each of the **Custom number input** fields has an associated ![...] button. Click on this button to open the **Properties** dialog for the selected number input. The **Properties** dialog provides fields where you can change the **Prompt** to describe the value that you want to enter and, if required, enter a default value. You also have the option to set bounds for any value, to prevent an operator from entering a value outside of a defined range. Refer to "How do Bounds on parameters work?" on page 7-8 for more details. The **Reset** button in the dialog resets the **Prompt** and **Decimal places** to their system default values and unchecks the **Enable bounds** box. It does not, however, change any values or units that you have set.

If you want your operator to enter different values of a particular number input for each specimen, you must add that number input to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. Refer to "Setup Test Prompts - Test Workspace Screen" on page 4-77 for more details.

If you want to run a prompted test, where the operator is prompted to enter values at a particular point in the test sequence, you can set up a prompted test. Refer to "Setup a prompted test sequence" on page 4-69 for more details.

Setup Default Text Inputs screen

This screen lets you customize a specimen label and text inputs for the default specimen. Refer to "What is the default specimen?" on page 7-7 for more information on the default specimen.

How does it work?

You open the **Setup Default Text Inputs** screen in the **Method** tab by clicking on **Specimen - Text Inputs** in the navigation bar.

Specimen Label

The **Specimen label** is a special text input that you can use in the graph legend instead of the specimen number. When you set up the graph legend (refer to "Setup Advanced Graph Styles" on page 4-55) you can choose Specimen number or Specimen label.

If you want your operator to enter a different label for each specimen, you must add Specimen label to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. Refer to "Setup Test Prompts - Test Workspace Screen" on page 4-77 for more details.

If you want to run a prompted test, where the operator is prompted to enter values at a particular point in the test sequence, you can set up a prompted test. Refer to "Setup a prompted test sequence" on page 4-69 for more details.

Example using specimen label

You have three specimens from a production run, designated as LOT21at8am, LOT21at1pm, LOT21at6pm. If you set up the graph to use Specimen number, the curves would be labeled Specimen 1, Specimen 2 and Specimen 3 in the graph legend.

Alternatively:

1. Add Specimen label to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. This allows the operator to enter the specimen labels for each specimen.

2. Set the graph legend to use Specimen label, using the **Setup Graph - Advanced** screen.

3. For each specimen, enter the label in the Specimen label field in the **Test Inputs** component of the test workspace.

The specimen curves in the graph are now labeled LOT21at8am, LOT21at1pm, and LOT21at6pm.

Custom Text Inputs

Each of the **Custom text input** fields has an associated ⊡ button. Click on this button to open the **Properties** dialog for the selected text input. The **Properties** dialog provides fields where you can change the **Prompt** to describe the text that you want to enter and, if required, enter some default text.

If you want your operator to enter different text for each specimen, you must add that text input to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. Refer to "Setup Test Prompts - Test Workspace Screen" on page 4-77 for more details.

If you want to run a prompted test, where the operator is prompted to enter values at a particular point in the test sequence, you can set up a prompted test. Refer to "Setup a prompted test sequence" on page 4-69 for more details.

Setup Default Choice Inputs screen

This screen lets you customize choice inputs for the default specimen. Refer to "What is the default specimen?" on page 7-7 for more information on the default specimen.

How does it work?

You open the **Setup Default Choice Inputs** screen in the **Method** tab by clicking on **Specimen - Choice Inputs** in the navigation bar.

Each of the **Custom choice input** fields has an associated ⊡ button. Click on this button to open the **Properties** dialog for the selected choice input, where you create and configure the choices.

If you want your operator to make different choices for each specimen, you must add that choice input to the **Test Inputs** component of the test workspace, using the **Setup Test**

Prompts - Test Workspace screen. Refer to "Setup Test Prompts - Test Workspace Screen" on page 4-77 for more details.

If you want to run a prompted test, where the operator is prompted to make choices at a particular point in the test sequence, you can set up a prompted test. Refer to "Setup a prompted test sequence" on page 4-69 for more details.

Examples

You can use choice inputs in a number of ways, from a simple list of options to more complex applications where making a choice automatically sets the values of test parameters that you link to that choice. You use linked parameters to configure a choice input so that when the operator makes a choice the values of one or more test parameters are set (e.g specimen dimensions or test speed).

"Setting up a simple Choice Input (without linked parameters)" on page 4-14

"Setting up a Choice Input with linked parameters" on page 4-15

Setting up a simple Choice Input (without linked parameters)

If you have a fixed number of options for a particular parameter and you want the operator to be able to select one of these from a drop-down list instead of typing into a text field, you can set up a choice input for this. An example might be specimens cut in different directions (45 degrees., 90 degrees, 180 degrees) or an indicator of specimen condition (wet, dry).

1. Open the **Properties** dialog for the desired choice input by clicking on its associated button. When the dialog first opens, the **Prompt** field is highlighted, the **Default value** is set to **<None>** and there are no more items in the list because the **Choice List** table is empty.

2. Type the text that you want to appear as a prompt for the operator in the **Prompt** field. This text replaces the **Custom Choice Input n** default text. For one of the examples quoted above, you might type **Direction**.

3. To add a new choice to the list for this input, click the **Add** button. A new line appears in the **Choice List** table.

4. Click to highlight the new line in the **Choice List** table and type a name for the choice (e.g. **90 degrees**). When you press **<ENTER>** to accept the text, that item is added to the list of choices in the **Default value** field.

5. Continue adding choices (e.g. **180 degrees**) until all the possibilities are included.

6. If you do not want **<None>** to appear as a choice in the list, uncheck the **Allow <None> as a choice** box.

*In this application, you would probably want to leave the box checked. Not allowing **<None>** as a choice is more useful in the more advanced application of choice inputs, using linked parameters. Refer to "What does <None> mean?" on page 4-17 for more information.*

7. If it is allowed, the **<None>** choice always appears at the top of the list of choices. The choices that you set up appear next in the list in the order that they display here in the **Choice List** table. You can highlight any row in the **Choice List** table and use the **Move Up** and **Move Down** buttons to change its position in the list. To delete a choice, highlight it in the **Choice List** table and click the **Delete** button.

8. When you have set up all the choices that you need for this choice input, choose the item that you want to be the default for that choice input in the **Default value** field. You might want to leave the default at **<None>**, if it is allowed, so that you prompt the operator to visit the field and make a choice.

9. Click the **Done** button to close the **Properties** dialog. The drop-down list for this choice input now contains the choices that you set up in the **Properties** dialog.

You cannot add or edit choices or linked parameters for a choice input after the first specimen in a sample has been tested. You can only change the Prompt at this stage.

Setting up a Choice Input with linked parameters

If you have a set of test conditions that are almost identical except for one or two key parameters, you can handle those differences within a single test method using choice inputs. For example, you might need to test identical specimens at three different test speeds.

1. Open the **Properties** dialog for the desired choice input by clicking on its associated ![...] button. When the dialog first opens, the **Prompt** field is highlighted, the **Default value** is set to **<None>** and there are no more items in the list because the **Choice List** table is empty.

2. Type the text that you want to appear as a prompt for the operator in the **Prompt** field. This text replaces the **Custom Choice Input n** default text. In the example quoted above, you might type **Speed**.

3. Select the desired parameters for the choice input:

   a. Click the **Linked Values...** button to open the **Linked Values** dialog.

   b. The list of **Available Parameters** is organized in a hierarchy according to the parameter type. You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs. To add an item to the **Selected Parameters** list, click on its name (e.g. **Rate 1**) in the **Available Parameters** list and click the **Add** button.

   c. The linked parameters will appear in columns in the **Choice List** table in the same order that the parameters appear in the **Selected Parameters** list. If you want to

change the order, highlight an item in the **Selected** list and click on the **Move up** or **Move down** button to change its position in the list.

*You can click and drag parameters between the **Available** and **Selected** lists. You can also click and drag parameters to change their order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

    d. Click the **Done** button to close the **Linked Values** dialog and return to the **Properties** dialog. You can return to the **Linked Values** dialog at a later time to add or remove linked parameters.

4. To add a new choice to the list for this input, click the **Add** button. A new line appears in the **Choice List** table and any linked parameters are set to their default values.

5. Click to highlight the new line in the **Choice List** table and type a name for the choice. In the example quoted, you might type **High**. When you press **<ENTER>** to accept the text, that item is added to the list of choices in the **Default value** field.

6. Update the values as needed for all the linked parameters. Click to highlight an entire table cell or double-click to place the cursor at a point within the text in the table cell. In the example quoted, you would set the value of **Rate 1** to the value that corresponds to **High**.

7. Continue adding choices (e.g. **Low**) and setting values until all the possibilities are included.

8. If you do not want to allow **<None>** to appear as a choice in the list, uncheck the **Allow <None> as a choice** box. Refer to "What does <None> mean?" on page 4-17 below for more information about the <**None**> choice.

9. If it is allowed, the **<None>** choice always appears at the top of the list of choices. The choices that you set up appear next in the list in the order that they display here in the **Choice List** table. You can highlight any row in the **Choice List** table and use the **Move Up** and **Move Down** buttons to change its position in the list. To delete a choice, highlight it in the **Choice List** table and click the **Delete** button.

10. When you have set up all the choices that you need for this choice input, choose the item that you want to be the default for that choice input in the **Default value** field.

11. Click the **Done** button to close the **Properties** dialog. The drop-down list for this choice input now contains the choices that you set up in the **Properties** dialog.

You cannot add or edit choices or linked parameters for a choice input after the first specimen in a sample has been tested. You can only change the Prompt at this stage.

What does <None> mean?

When you set up a choice input and link values of certain parameters to it, those values are locked and can only be changed by selecting a different choice for that choice input.

For example, you have three choices for the choice input name **Color**, designated as **Red**, **Green**, and **Blue**, set up as follows:

Prompt	Width (mm)	Thickness (mm)	Rate 1 (mm/min)
Red	10	4	20
Green	12	4	20
Blue	15	6	25

If you do not allow **<None>** as a choice, the operator can only choose between these three options and cannot make any changes to the values of **Width**, **Thickness** or **Rate 1**.

If you allow **<None>** as a choice, the operator can choose **<None>** and the software does not change the values of the linked parameters. The values remain where they were but the operator may modify the linked values, either from the **Test Inputs** component of the test workspace, or the appropriate screen in the **Method** tab.

Restrictions on linked parameters

You can only add a parameter once to a single choice input. If you add **Width**, for example, to the linked values for **Custom Choice Input 1**, you will see that **Width** is no longer available to you when you choose linked values for **Custom Choice Input 2**.

You can include a choice input in the linked values for another choice input. If you do this, the table cell for the linked value becomes a drop-down list box to let you choose the value. This behavior is restricted to avoid problems with recursion, i.e. if you choose **Custom Choice Input 1** as a linked value for **Custom Choice Input 3** you cannot then choose **Custom Choice Input 3** as a linked value for **Custom Choice Input 1**.

Setup Default Specimen Notes screen

This screen lets you customize up to 3 notes for the default specimen. Refer to for more information on the default specimen.

How does it work?

You open the **Setup Default Specimen Notes** screen in the **Method** tab by clicking on **Specimen - Notes** in the navigation bar.

Each of the **Specimen note** fields has an associated ⊡ button. Click on this button to open the **Properties** dialog for the selected note. The **Properties** dialog provides fields where you can change the **Prompt** to describe the note that you want to enter and, if required, enter some default text.

If you want your operator to enter a different note for each specimen, you must add that note to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. Refer to for more details.

If you want to run a prompted test, where the operator is prompted to enter values at a particular point in the test sequence, you can set up a prompted test. Refer to for more details.

Control menu items

The **Control** menu on the navigation bar for the **Method** tab contains the following menu items:

- Pre-Test

- Test

- End of Test

- Data

- Strain

- Alerts

Setup Control - Pre-Test

Open the **Setup Control - Pre-Test** screen in the **Method** tab by clicking **Control > Pre-Test** in the navigation bar.

This screen sets up a preload segment for a test and, if the test type supports it, a precycling segment.

All test types have preload and auto balance capability. The following test types also support precycling:

- Tension
- Tension Profile
- Compression
- Compression Profile
- Metals
- Asphalt

How does Preload work?

Preload is most often used to remove any slack in a specimen before testing starts. The system ramps to achieve a value of load or stress that you specify as the preload. Data is never captured during preload.

Enable or Disable

When you enable preload, other fields appear to let you set up the preload parameters. When you uncheck the box to disable the function, the additional fields disappear. Disabling the function does not affect any values that you have entered in the additional fields.

When you enable preload, the test will begin with a ramp to a load or stress value that you specify.

Control mode

You can select a specific channel to control the crosshead/actuator movement during the preload segment of the test. The list of channels that you can choose from depends upon the controller that you are using. In some cases, Extension may be the only channel available.

Rate

Sets the rate at which the crosshead/actuator moves during the preload segment of a test.

Channel

The channel you select is the channel that is monitored during the preload segment of a test to determine when the preload condition has been met.

There are several factors that affect the number of channels available to you. Refer to "How does the system handle channels?" on page 8-2 for more information about the channels available.

Value

This field sets the load or stress value to which the testing system ramps in the preload segment of a test.

How does Auto Balance work?

The most common example of the use of auto balance is to balance an extensometer that is connected to the Axial Strain channel when a specified value of load has been achieved. You specify the load using the preload settings.

If you set up a preload and you enable **Auto balance**, the system balances the extensometer as soon as the preload value is achieved. When you start the test, the crosshead/actuator moves to achieve the preload value. Any extensometer connected to the channel designated as **Source for tensile, compressive** or **flexure strain** is then balanced before the next test segment begins. This lets you set a value of load where you want the extensometer to be balanced. If no extensometer is assigned (i.e. **Extension** is assigned to axial strain), strain is set to zero and the gauge length is corrected by adding the current value of extension. The corrected gauge length is thus equal to the sum of the original specimen gauge length and the crosshead/actuator travel from the beginning of the test to the point of auto balance. This lets you use the newly balanced tensile, compressive or flexure strain and tensile, compressive or flexure extension to set cycling limits relative to the preload position.

If you enable **Auto balance** without setting up any preload, the rebalance is carried out before starting a test.

The auto balance feature lets you balance a device connected to any channel in the testing system, not only the channel that has been designated as the **Source for tensile, compressive** or **flexure strain**.

Auto balance checkbox

When you check the **Auto balance** box, the screen expands to display two lists, **Available Channels** and **Selected Channels**. Depending upon the test type, either **Tensile Strain**, **Compressive Strain**, or **Flexure Strain** is automatically added to the **Selected** list as this is the most common way that auto balance is used.

Available and Selected lists

When you enable auto balance, either **Tensile Strain**, **Compressive Strain**, or **Flexure Strain** is automatically added to the **Selected** list. This sets the system up to balance an extensometer connected to that strain channel. This might be a clip-on extensometer, or a video or automatic extensometer.

If you have another device connected to another channel that needs to be balanced, you need to add that channel to the **Selected** list.

If you are using an automatic extensometer and you want the arms to attach at the start of the test, you must auto balance the extensometer prior to the start of the test. If you do not, the test will run but the arms will not attach automatically.

To auto balance the extensometer, you must add the channel to which it is connected to the ***Selected*** *list.*

The **Available** list consists of all the real channels in the system, with the exception of Extension.

Show All Parameters

This box is normally unchecked and the **Available Channels** list contains only those data channels that are valid for the current testing system. If you check this box, all channels are shown in the list, even though they may not be appropriate for the current test setup. Such channels are shown in italics. You can add any of these channels to the list of **Selected Channels**.

The **Show all parameters** checkbox is a global setting and is applied to all the lists of parameters and channels in all screens.

How does Precycling work?

An example of the use of precycling is in the testing of fabric. It is sometimes desirable to precondition the fabric by stretching and releasing it a few times by precycling between two values of extension, for example. Data is not normally captured during precycling, but you can enable data capture for precycling if you wish in the **Setup Control - Data** screen.

Warning

Hazard - Take care when setting different channels to the maximum and minimum cycle boundary points. Unexpected crosshead or actuator movement may occur, or the precycling segment may not run at all. For example, if you set one channel as a load value, and another as a strain value, it is possible that the minimum boundary could be set greater than the maximum, or even that they could cross over during a test as the material properties change.

Enable or Disable

When you check a box to enable precycling, other fields appear to let you set up the precycling parameters. When you uncheck the box to disable the function, the additional fields disappear. Disabling the function, however, does not affect any values that you have entered in the additional fields.

When you enable precycling, the system cycles between two boundary points that you specify.

Capture precycle data

If enabled, data is captured for display and storage in data files. Any calculations that you select do not operate on precycle data.

Cycles

Set the number of cycles that you want the system to perform in the precycling segment of the test.

Control mode

You can select a specific channel to control the crosshead/actuator movement during the precycling segment of the test. The list of channels that you can choose from depends upon the controller that you are using. In some cases, Extension may be the only channel available.

Rate

Sets the rate at which the crosshead/actuator moves during the precycling segment of a test.

Maximum and Minimum channels

The testing system can precycle between a maximum and a minimum boundary point. You can select a separate channel for each boundary.

There are several factors that affect the number of channels available for the boundary points. Refer to "How does the system handle channels?" on page 8-2 for more information about the channels available.

Maximum and Minimum values

These values set the maximum and minimum boundary points for precycling.

Setup Control - Test

Open the **Setup Control - Test** screen in the **Method** tab by clicking **Control > Test** in the navigation bar.

This screen sets up the main test segment for a test. The different requirements for each test type means that this screen looks very different depending on the test type you select.

The following table provides a summary of the functions available in each test type. For more information, click on a specific test type below.

Test Type	Functions
Asphalt Tension Compression Flexure	Up to 2 ramps
Peel, Tear and Friction	1 ramp
Tension, Creep, Relaxation Compression, Creep, Relaxation Flexure, Creep, Relaxation	1 ramp and 1 hold
Metals	Up to 3 ramps and 1 hysteresis
Tension Profile Compression Profile	Link to a file containing the test profile

General description

The minimum requirement (except for the Profile test types) is one ramp, so **Ramp 1** is always enabled. Other ramps, holds and hysteresis segments, if available, appear as checkboxes which you can enable and then set up as required for your tests.

When you check a box to enable a function, other fields appear to set up that function. When you uncheck a box to disable the function, the additional fields disappear. Disabling the function, however, does not affect any values previously entered in the additional fields.

Ellipsis buttons ⌶

Ellipsis buttons appear adjacent to the **Rate** fields only because **Rate** is the only test control parameter that you can add to the **Test Inputs** or prompt for in a prompted test.

Click on the ⌶ button to open the **Properties** dialog for the selected rate. This dialog provides fields where you can change the **Prompt** (you might prefer **Speed** to **Rate**, for example) and, if required, enter a default value. You also have the option to set bounds for the value, to prevent an operator from entering a value outside of a defined range. Refer to "How do Bounds on parameters work?" on page 7-8 for more details. The **Reset** button in the dialog resets the **Prompt** and **Decimal places** to their system default values and unchecks the **Enable bounds** box. It does not, however, change any values or units that you have set.

If you want your operator to enter different values of a particular rate for each specimen, you must add that rate to the **Test Inputs** component of the test workspace, using the **Setup Test Prompts - Test Workspace** screen. Alternatively, you could use the **Prompt**

Sequence to set up a prompted test, prompting the operator to enter values at particular points in the test sequence.

Setup Control - End of Test

Open the **Setup Control - End of Test** screen in the **Method** tab by clicking **Control > End of Test** in the navigation bar.

This screen sets up the End of Test criteria for a test and, if the test type requires it, an End of Hold criteria.

You can choose up to four separate end of test criteria. These criteria operate independently and the first one that is satisfied will stop the test.

End of Test 1

The criteria available for End of Test 1 are listed in the table below. **Rate of load**, **Load threshold**, and **Load with delay** are always available. **Stress drop** is only available with the Metals test method. These criteria provide different ways of defining a specimen break.

There are several factors that affect the number of channels available to you as end of test criteria. Refer to for more information about the channels available.

End of Test Criteria	Associated Fields
Rate of load	**Sensitivity (%)** The test ends when the load drops by the **Sensitivity** value within a 100ms time period. The sensitivity is measured as a percentage of the load at the beginning of the 100ms period. The load must first attain a value of 1% of the full-scale of the load cell before the detector becomes active.
Load threshold	**Load drops to** The test ends when the load falls to the **Load drops to** value. The load must first attain a value 1.5 times the **Load drops to** value before the detector becomes active.
Load with delay	**Load drops to** **Delay** The detector is inactive for the **Delay** period that you specify. After this time has elapsed, the test ends when the load falls to the **Load drops to** value. In this case there is no specific value that the load must attain before the detector becomes active.

End of Test Criteria	Associated Fields
Stress drop	**Activation stress** **Stress drops to** The detector is inactive until the test reaches the **Activation stress** point that you specify. After this point, the test ends when stress falls to the **Stress drops to** value.
% Peak Load	**Load drops by (%)** **Load threshold** The detector is inactive until the load specified in the **Load threshold** field has been exceeded. After that value is attained, the test ends when the detector finds the specified **Load drops by (%)** from peak load.
Number of PIP marks	**Value** The test ends when the specified number of PIP marks is detected. This would normally be used in a peel test that has been configured for interval testing.
Channel name	**Value** The detector searches for the specified **Value** of the chosen channel. The test ends when that value is attained.
Axial strain source becomes invalid	No associated fields The test ends if data from the device allocated to the axial strain source becomes invalid. This might happen if you are using a video extensometer and the extensometer ceases to see the marks on the specimen.
Digital lines	No associated fields The test ends when the digital line event condition, which is set in console, is met.

End of Test 2, 3 and 4

The criteria available for the additional End of Test conditions are listed in the table below. **Stress drop** is only available with the Metals test method.

There are several factors that affect the number of channels available to you as end of test criteria. Refer to "How does the system handle channels?" on page 8-2 for more information about the channels available.

End of Test Criteria	Associated Fields
Stress drop	**Activation stress** **Stress drops to** The detector is inactive until the test reaches the **Activation stress** point that you specify. After this point, the test ends when stress falls to the **Stress drops to** value.
Number of PIP marks	**Value** The test ends when the specified number of PIP marks is detected. This would normally be used in a peel test that has been configured for interval testing.
Channel name	**Value** The detector searches for the specified **Value** of the chosen channel. The test ends when that value is attained.
Axial strain source becomes invalid	No associated fields The test ends if data from the device allocated to the axial strain source becomes invalid. This might happen if you are using a video extensometer and the extensometer ceases to see the marks on the specimen.
Digital lines	No associated fields The test ends when the digital line event condition, which is set in console, is met.

End of Hold area (creep and relaxation test types only)

You set the condition for the end of the hold in a relaxation test as follows:

1. Select from a list of channels in the **Criteria** field.

2. Set a value for change in the chosen channel in the **Delta** field. The change in value is measured from the start of the hold.

For example, if you want to end the hold when the value of load changes by 50N from the start of the hold, set **Criteria** to **Load** and **Delta** to **50N**. Similarly, if you want the hold to last for 90 seconds, set **Criteria** to **Time** and **Duration** to **90 secs**.

There are several factors that affect the number of channels available to you. Refer to "How does the system handle channels?" on page 8-2 for more information about the channels available.

Interval Testing area (peel, tear and friction test type only)

The Peel, Tear and Friction test type has an additional feature that lets you divide a test on a single physical specimen into intervals and treat each of those intervals as a single specimen. This feature requires additional hardware, a Pipping device, that lets you mark each interval while the test is running.

When you check the **Divide each specimen into intervals** box, additional fields appear to control how the software handles the end of the first interval and the data collected after the last PIP mark. Refer to "Interval testing reference" on page 7-21 for more details.

You can use the number of PIP marks as your criterion for the end of the test. Each of the **End of Test** criteria lists include **Number of PIP marks** as an option.

How does the End of Test Action field work?

You choose an End of Test action that defines the behavior of the crosshead/actuator when either:

- the End of Hold criteria are satisfied (creep and relaxation test types only), or

- one of the End of Test criteria are satisfied,

whichever occurs first.

The End of Test actions are:

- **Stop** - the crosshead/actuator stops.

- **Return** - the crosshead/actuator stops and returns to the gauge length position (i.e. the point at which extension equals zero).

- **Stop, then return** - the crosshead/actuator stops. A message box appears prompting you to remove the specimen. When you have removed the specimen, clicking on the **OK** button in the message box returns the crosshead/actuator to the gauge length position. Alternatively, you can remove the specimen and return the crosshead/actuator to the gauge length position using the hardware Control Panel, dismissing the message box.

- **Specimen protect** - the crosshead/actuator stops. If you enabled Specimen protect before starting the test, the software re-enables it when the test ends. Specimen protect is only available on 5900, 5500, 5500A, IS02, 5800 and 8800 controllers.

Setup Control - Data

Open the **Setup Control - Data** screen in the **Method** tab by clicking **Control > Data** in the navigation bar.

This screen defines the frequency at which test data is captured from the testing machine and saved to a raw data file. Test data is acquired simultaneously from all available system channels at the intervals that you specify. You can select default or manual data capture.

Data collection controls are the same for all test types but the intervals that you can specify vary depending on the type of controller being used in the testing system. For example, a 5800 controller is capable of faster data capture than a 5500 controller.

Refer to "Setup Control - Pre-Test" on page 4-18 to find out about capturing data during the precycling phase of the test.

How does Default Data Capture work?

Default data capture sets up two channels which are used to control when the data is captured. The first channel is time with a 1 second interval. The second channel is load with an interval of 0.25% of the full-scale of the installed load cell. When you select default data capture, the channel information displays, but is grayed out to show that you cannot change the selected values. The third channel is disabled and grayed out.

For 3300, 4400, 4300 and 4200 controller types, default data capture is not available.

How does Manual Data Capture work?

Using manual data capture, and within the limits of the controller type that you are using, you can enable and set up to three channels to control the capture of system data. You set up each channel separately, and the system captures the data from all available system channels whenever any of the selected channel intervals is exceeded.

Enable or Disable Criteria 1, 2 and 3

When you enable a channel for control of data capture, the system monitors the channel and captures a complete set of system data whenever the channel value changes by the amount that you set as the interval for that channel. Disabling a channel does not affect the settings, but it causes the system to stop monitoring for the value set as the interval.

*For 3300, 4400, 4300 and 4200 controller types, only **Criteria 1** is available.*

Channel

There are several factors that affect the number of channels available to you to control when data is captured. Refer to "How does the system handle channels?" on page 8-2 for more information about the channels available.

*For 3300, 4400, 4300 and 4200 controller types, only **Time** is available.*

Interval

The data capture interval is the amount that a parameter needs to change for test data to be captured. For example, if you set a data capture interval of 1 N on the load channel, data from all available channels is captured each time the load changes by 1 N.

The capture of data depends not only upon the intervals specified but also on when the last set of data was logged. The system captures data at a point in the test when one of the intervals specified has been attained since the last set of data was logged.

The limits for data capture are different for each controller type:

Controller	Maximum Data Rate
5900 and 5500A	1kHz (1ms time interval) *
5500 and IS02	500Hz (2ms time interval)
5800 and 8800	5kHz (0.2ms time interval)
3300	100Hz (10ms time interval)
4400, 4300, 4200 **	20Hz (50ms time interval)

**The data rate for these controllers is fixed.

* Sytem performance is dependent upon data rate, number of channels and computer hardware. When capturing data at higher rates, avoid editing the graph or raw data viewer during a test as this can cause additional stress on the system.

Record with web camera

Place a check in this checkbox to enable the web camera for recording. You must check this box in order to record a test using a web camera that is connected to the system.

You must also set the video frame interval to establish the rate at which the web camera records a test. If the frame interval is set outside the camera's limits, a warning message displays when you start a test. The message indicates the frame interval range for the connected web camera.

Setup Control - Strain

Open the **Setup Control - Strain** screen in the **Method** tab by clicking **Control > Strain** in the navigation bar.

This screen sets up the sources for strain measurement in a test.

In a simple test you might connect an extensometer to the Strain 1 channel and assign Strain 1 to axial strain. The strain values are taken directly from the extensometer and Strain 1 can be considered a real channel. Similarly, if you are not using an extensometer, you might assign Extension to axial strain and the system will then derive values of strain from values of extension (a derived channel). Refer to "Types of channels" on page 8-5 for additional information on channels.

Alternatively, you can use the concept of a composite channel for axial strain. You might assign Strain 1 to axial strain but then choose to remove the extensometer at a point during the test. While the extensometer is attached, the system reads values of strain directly from the extensometer. After it is removed, the system derives values of strain from extension. The extension readings made after the removal of the extensometer are corrected and normalized using the Extensometer Removal Correction Algorithm. Refer to the Channel Reference chapter in the Calculations manual for more information.

Different test types support some or all of the facilities available.

The following test types support **Axial Strain**, **Transverse Strain** and **Extensometer removal**:

- Asphalt

- Tension

- Tension Creep Relaxation

- Compression

- Compression Creep Relaxation

- Metals

The following test types support **Axial Strain** and **Transverse Strain**:

- Tension Profile

- Compression Profile

The following test types support **Axial Strain** and **Extensometer removal**:

- Flexure

- Flexure Creep Relaxation

The Peel, Tear and Friction test type does not support any of these features, and this screen does not appear.

Axial Strain area

Source for Tensile, Compressive or Flexure Strain

This is where you select the source for axial strain measurement. The exact text in the **Source for...** field depends upon the test type that you are using.

In tests where you are not using an extensometer, you can assign the **Source for tensile, compressive** or **flexure strain** to **Extension**. Axial strain values are then calculated using measurements of crosshead extension or actuator position divided by the specimen gauge length.

If you have an extensometer connected, for example, to the Strain 1 channel, you would assign the **Source for tensile, compressive** or **flexure strain** to **Strain 1**. If you want to remove that extensometer before the test ends, check the **Remove extensometer during test** box. Refer to the appropriate section below for more details.

Tensile, compressive and flexure strain are types of composite channel; that is, a channel that can change the source of its information during a test. Refer to "How does the system handle channels?" on page 8-2 for more information about composite channels.

Remove Extensometer area

If you choose to assign to axial strain a channel which has an extensometer connected to it (**Strain 1**, for example) you can choose to remove the extensometer at a point during the test. Up to the point of removal, the system derives any values of tensile, compressive or flexure strain directly from extensometer readings. After the extensometer is removed, the testing system derives its values of tensile, compressive or flexure strain from crosshead extension or actuator position. The extension readings made after the removal of the extensometer are corrected and normalized using the Extensometer Removal Correction Algorithm. Refer to "How does the system handle channels?" on page 8-2 for more information.

Removal criteria

You can choose from a list of criteria to control when the extensometer is removed. **Load threshold** and **Offset Yield** are always available.

Removal Criteria	Associated Fields
Load threshold	**Load drops to** The removal point is reached when the load falls to the **Drop to** value. The load must first attain a value 1.5 times the value specified before the detector begins searching for the **Drop to** value.
Offset Yield	**Offset** The removal point is reached when the offset yield point that you specify is attained. The modulus for the offset yield is calculated using a least squares fit over the 10 most recently acquired data points. The first of these 10 data points is taken after 2 seconds of test time has elapsed and at least two data points have been collected.
% Peak Load	**Load drops by (%)** **Strain threshold** The detector is inactive until the strain specified in the **Strain threshold** field has been exceeded. After that value is attained, the removal point is reached when the system detects the specified **Load drops by (%)** from peak load.
Channel name	**Value** The detector searches for the specified **Value** of the chosen channel. The removal point is reached when that value is attained, regardless of whether the value is increasing or decreasing.

There are several factors that affect the number of channels available to you as extensometer removal criteria. Refer to "How does the system handle channels?" on page 8-2 for more information about the channels available.

Action during removal

There are three actions that you can choose:

- **Continue test** - the crosshead/actuator continues to move through the removal point that you specified. A message alerts you that the extensometer may be removed. The test continues while you remove the extensometer.

- **Pause test and continue data capture** - the crosshead/actuator pauses at the removal point that you specified. The system records data during the pause. A message prompts you to remove the extensometer. Once you have done this, click **OK**, and the test continues. To reduce the risk of personal injury or damage to the extensometer, the crosshead/actuator is held in extension/position control during the pause.

- **Pause test but suspend data capture** - the crosshead/actuator pauses at the removal point that you specified. The system does not record data during the pause. A

message prompts you to remove the extensometer. Once you have done this, click **OK**, and the test continues. To reduce the risk of personal injury or damage to the extensometer, the crosshead/actuator is held in extension/position control during the pause.

Freeze strain value at removal

Up to the point of extensometer removal, the system derives any values of tensile, compressive or flexure strain directly from extensometer readings.

If this box is unchecked, the testing system derives values of tensile, compressive or flexure strain after extensometer removal from crosshead extension or actuator position.

If this box is checked, the system freezes the strain value at the value obtained when the extensometer was removed.

Transverse Strain area

In addition to axial strain, you can set up sources for up to two transverse strain channels.

Source for Transverse Strain

For each transverse strain channel, you choose a source, either Strain 1 or Strain 2.

Source for Gauge Width:

This field lets you choose a specimen dimension from which to take the gauge width. The selected specimen dimension becomes the gauge width for the transverse extensometer. If the extensometer connected to the chosen source is attached across the specimen width, then you would choose **Width** in this field. If you do not want to use a specimen dimension, you should select **Manual**. In this case, you can enter your own value, which becomes the gauge width for the transverse extensometer. The value of gauge width is then used to calculate transverse extension from transverse strain.

Reverse Polarity

A transverse extensometer produces a positive signal as the extension decreases. An axial extensometer produces a negative signal as the extension decreases. If the extensometer assigned to the transverse strain source is an axial type, you must check the **Reverse polarity** box so that the negative signal received from the axial extensometer looks like a positive signal within the software.

Setup Control - Alerts

You open the **Setup Control - Alerts** screen in the **Method** tab by clicking **Control > Alerts** in the navigation bar.

This screen sets up an audible alert that sounds whenever the value of load, or a channel derived from load, reaches a chosen value.

Check the **Alert** box to enable the feature. Load is always available in the **Threshold channel** selection list. Some test types also offer derived channels (e.g. Compressive Load and Load/Width). You then enter a value for the chosen channel.

When the test is running, an audible "beep" sounds when the value of load passes through the chosen value. There are two different tones used; one for increasing load and another for decreasing load.

The system uses the "Exclamation" tone for increasing load and the "Critical Stop" tone for decreasing load. You can change the tones by changing the files allocated to these sounds in the Windows Sounds Control Panel.

Calculations menu items

The **Calculations** menu on the navigation bar for the **Method** tab contains the following menu items:

- Setup

- Rounding

Setup Calculations

This screen sets up the calculations to be performed on the test data.

Use the **Setup Calculations** screen to:

- Add calculations to the **Selected** list, which in turn adds their associated results to the **Available** list in the **Setup Results Table Columns** screen.

- Modify the parameters for calculations already in the **Selected** list, which in turn modifies them in the **Available** list in the **Setup Results Table Columns** screen.

- Remove calculations from the **Selected** list, which in turn removes their associated results from the **Available** list in the **Setup Results Table Columns** screen.

- Change the order of the calculations in the **Selected Calculations** list.

Refer to "Setup Results Table Columns" on page 4-43 for additional information.

To keep changes made to the **Selected Calculations** list, save either the test method or the sample.

Access and layout

To open the **Setup Calculations** screen:

1. Click on the **Method** tab.

2. Click **Calculations > Setup** in the navigation bar.

There are three areas to the screen; a list of **Available Calculations**, a list of **Selected Calculations**, and a parameters area to view and edit the parameters for a calculation as required.

The **Available Calculations** list contains calculation names as well as calculation groups, which might contain more than one calculation. Refer to for details on selecting a specific calculation within a group.

The title bar for the parameters area displays the default calculation name for the calculation highlighted in the **Selected Calculations** list. If you customize the name of the calculation in the Selected list, the title bar continues to show the default calculation name.

Parent and dependent calculations

The order of the calculations in the **Selected Calculations** list does not determine the order in which the calculations are performed nor does it reflect any dependencies between calculations. Dependencies between calculations are shown in the parameters area. Dependent calculations have a **Parent calculation** field shown as a parameter. The dependent calculation requires the result of its parent calculation in order to calculate its own result.

Dependent calculations display gray and italicized when there is no parent selected in the **Parent calculation** field. To resolve this dependency, either select a calculation in the **Parent calculation** field or remove the dependent calculation from the **Selected** list.

*The parent calculation must be in the **Selected** list for it to appear in the **Parent calculation** field.*

Parent calculations have a **Dependent calculations** field shown as a parameter. This field displays all the calculations that depend on it as a parent calculation. It cannot be edited. Changes to the parent/dependent relationship must be done via the dependent calculation, in the **Parent calculation** field.

User calculations can also have parent relationships. To change the parent/dependent relationship in a user calculation, edit the user calculation equation.

Add a calculation

The following procedure uses modulus as an example.

To add a calculation to the **Selected Calculations** list:

1. Scroll through the **Available Calculations** list and click on a calculation to select it (**Modulus**).

2. Click **Add** to move it to the **Selected Calculations** list.

3. Click **Modulus** in the **Selected Calculations** list to highlight it. The parameters area displays the common parameters for the modulus group of calculations.

4. In the **Type:** field, select the type of modulus calculation. Automatic is the default selection, but there are several different modulus calculations available.

5. Edit the parameters for the calculation. Refer to the Calculations Library chapter in the Instron® Calculations Reference manual for details about the parameters required for a particular calculation.

6. Repeat Step 1 through 5 for each calculation in the **Selected calculations** list.

Modify calculation parameters

To modify calculation parameters:

1. Select a calculation in the **Selected Calculations** list. The parameters for that calculation appear in the parameters area.

2. Modify the parameters as needed. Changes made to the **Description** does not update the name in the **Selected Calculations** list until you either highlight another calculation in the **Selected** list or press Enter.

3. Repeat Step 1 and 2 for each calculation that you want to modify.

If a parameter value is outside its valid range, an error message displays. The message includes the invalid value and the acceptable range. Click **OK** to return to the **Setup Calculations** screen. The focus is in the field but the value reverts back to the value prior to the change.

Any changes made to a calculation in the **Selected Calculations** list also appear in the Results and Statistics components under **Results 1** and **Results 2** in the navigation bar.

Remove calculations

To remove a calculation:

1. Select the calculation in the **Selected Calculations** list.

2. Click **Remove**.

3. Repeat Step 1 and 2 for each calculation that you want to remove.

If you remove a parent calculation, the display of any dependent calculation in the Selected list changes to a gray and italicized format. To resolve the dependency, either remove the dependent calculation along with the parent calculation or add the parent calculation back to the Selected list and then select it again in the **Parent Calculation** field for the dependent calculation.

Change the order of calculations in the list

To change the order of calculations:

1. Select the calculation in the **Selected Calculations** list.

2. Click **Up** or **Down** to change the order as needed.

Setup Rounding Rules

This screen lets you create specific rounding rules for displayed values. Test standards may have specific requirements about rounding values, so this screen lets you create a rounding format to satisfy such requirements.

You can create simple rounding rules in which all data values are rounded to the same rounding value, or create rounding rules with up to four ranges with different data criteria and rounding values.

For each range, including the primary range, you must set the rounding value by selecting both the fraction and the multiplier that determines the rounding value. When there are multiple ranges, you must also set the criteria that determines the range's boundaries so the system applies the correct rounding value.

If there are no ranges enabled, or the data value does not meet any of the range criteria, then the system uses the primary range's rounding value. The following are different scenarios that show how the ranges are used.

Scenario	Range Example	Results
When ranges are enabled, the system identifies the range with the largest criteria where the value meets the criteria and uses the rounding value for that range.	Range 2 >=1 Range 3 >=10 Range 4 >= 5	For value 12, the system uses Range 3. For value 7, the system uses Range 4.
If there are multiple ranges with the same criteria value, the system selects the range with the > operator rather than the >= operator.	Range 2 >= 10 Range 3 >10	For value 12, the system uses Range 3.
If there are multiple ranges with the same criteria value and criteria, the system selects the first range.	Range 2 >= 10 Range 3 >= 10	For value 12, the system uses Range 2.

Refer to "Rounding rule examples" on page 4-39 for specific examples.

Create a new rule

To create a new rounding rule:

1. Click **Add rule** and enter a name in the **Description** field.

   After entering a name in the **Description** field, it displays in the **Available Rules** list.

2. Select a fraction from the first drop-down field and then select a multiplier from the second drop-down field.

   The system multiplies these two numbers together to determine the rounding value and displays the result in the **Round value to:** field.

   If you only need one range, then proceed to Step 6.

3. If you require additional ranges for this rounding rule, then place a check next to each required range.

4. In the **Value criteria** fields for each enabled range, select the data value criteria for each range. These criteria set the limitations for each range.

5. For each enabled range, select a fraction from the first drop-down field and the multiplier from the second drop-down field to determine the rounding value.

6. To save these changes, save the test method. If you have a sample open, then also save the sample.

The new rounding rule is now available to select in any **Rounding Format** field.

Delete a rule

To delete a rule:

1. Select the rule from the **Available Rules** list.

2. Click **Delete rule**.

   If the rule is used in the test method, then a warning message displays advising that values using this rule will change to the default format, Decimal places.

3. Save the changes to the test method. If you have a sample open, then also save the sample.

Rounding rule examples

The software meets the rounding requirements described in the following standards:

- ASTM E29

- Chinese standard GB/T228-2002

As described in ASTM E29, when two choices are possible, as when the digits dropped are exactly a 5 or a 5 followed by zeros, the system rounds the value to the nearest even digit.

To create a rounding rule, you specify a fraction and a multiplier. Based on the fraction you select, the system determines the associated factor (see the table below) and uses the following process to round the data value.

Selected Fraction	Associated Factor
.1	10
.125	8
.2	5
.25	4
.5	2

The system:

1. multiplies the data value by the factor for the specified fraction.

2. rounds the result from step 1 to the specified multiplier.

3. divides the result from step 2 by the factor.

Simple rounding

Simple rounding requires only one range and all data values are rounded using the same primary range.

Example 1

Rounding value = .25   Fraction = .25
                         Multiplier = 1.0
                         Factor = 4

The system rounds data values as per the example below.

Data Value	Rounding Process		Rounded Value
1.2	Step 1:	1.2 * 4 = 4.8	1.25
	Step 2:	4.8 rounds to the nearest 1 = 5	
	Step 3:	5/4 = 1.25	
1.375	Step 1:	1.375 * 4 = 5.5	1.50
	Step 2:	5.5 rounds to the nearest 1 = 6	
	Step 3:	6/4 = 1.5	
1.625	Step 1:	1.625 * 4 = 6.5	1.50
	Step 2:	6.5 rounds to the nearest 1 = 6	
	Step 3:	6/4 = 1.5	
1.5	Step 1:	1.5 * 4 = 6.0	1.50
	Step 2:	6.0 rounds to the nearest 1 = 6	
	Step 3:	6/4 = 1.5	

Example 2

Rounding value = 50   Fraction = .5
                        Multiplier = 100
                        Factor = 2

The system rounds data values as per the example below.

Data Value	Rounding Process	Rounded Value
6025	Step 1: 6025 * 2 = 12050 Step 2: 12050 rounds to the nearest 100 = 12000 Step 3: 12000/2 = 6000	6000
6075	Step 1: 6075 * 2 = 12150 Step 2: 12150 rounds to the nearest 100 = 12200 Step 3: 12200/2 = 6100	6100
6050	Step 1: 6050 * 2 = 12100 Step 2: 12100 rounds to the nearest 100 = 12100 Step 3: 12100/2 = 6050	6050

Multiple range rounding

The chinese standard GB/T228-2002 requires multiple ranges in its rounding requirements as shown in the example below.

Example 1

Range	Rounding Interval
<= 200 N/mm^2	1 N/mm^2
> 200 N/mm^2 ~ 1000 N/mm^2	5 N/mm^2
> 1000 N/mm^2	10 N/mm^2

To create this rounding rule, make the following selections:

Range	Fraction	Multiplier	Value Criteria
1	0.1	10	Not applicable
2	0.5	10	> 200
3	0.1	100	> 1000

Based on the selections above, data values are rounded as shown in the table below.

Data Value	Rounding Process		Rounded Value
185.4	Step 1:	185.4 * 10 = 1854	185
	Step 2:	1854 rounds to the nearest 10 = 1850	
	Step 3:	1850/10 = 185	
185.6	Step 1:	185.6 * 10 = 1856	186
	Step 2:	1856 rounds to the nearest 10 = 1860	
	Step 3:	1860/10 = 186	
185.5	Step 1:	185.5 * 10 = 1855	186
	Step 2:	1855 rounds to the nearest 10 = 1860	
	Step 3:	1860/10 = 186	
186.5	Step 1:	186.5 * 10 = 1865	186
	Step 2:	1865 rounds to the nearest 10 = 1860	
	Step 3:	1860/10 = 186	
502.4	Step 1:	502.4 * 2 = 1004.8	500
	Step 2:	1004.8 rounds to the nearest 10 = 1000	
	Step 3:	1000/2 = 500	
502.5	Step 1:	502.5 * 2 = 1005	500
	Step 2:	1005 rounds to the nearest 10 = 1000	
	Step 3:	1000/2 = 500	
505	Step 1:	505 * 2 = 1010	500
	Step 2:	1005 rounds to the nearest 10 = 1000	
	Step 3:	1000/2 = 500	
507.5	Step 1:	507.5 * 2 = 1015	510
	Step 2:	1015 rounds to the nearest 10 = 1020	
	Step 3:	1020/2 = 510	
1014	Step 1:	1014 * 10 = 10140	1010
	Step 2:	10140 rounds to the nearest 100 = 10100	
	Step 3:	10100/10 = 1010	

Data Value	Rounding Process		Rounded Value
1015	Step 1:	1015 * 10 = 10150	1020
	Step 2:	10150 rounds to the nearest 100 = 10200	
	Step 3:	10200/10 = 1020	
1025	Step 1:	1025 * 10 = 10250	1020
	Step 2:	10250 rounds to the nearest 100 = 10200	
	Step 3:	10200/10 = 1020	

Results 1 and Results 2 menu items

The **Results 1** and **Results 2** menus on the navigation bar for the **Method** tab contain the following menu items:

- Columns

- Statistics

- Format

Setup Results Table Columns

This screen sets up the content for each of the two results tables, which appear on the test workspace. Each table has its own setup screen, **Table 1 Columns** and **Table 2 Columns**, and they operate in exactly the same way.

You can also set up calculations for your results under the **Calculations** menu item in the navigation bar. From the **Setup Calculations** screen, you can add, remove, and modify calculations to meet your specific needs. Refer to "Setup Calculations" on page 4-34 for additional information.

Access and layout

To open the **Setup Results Table - Columns** screen:

1. Click on the **Method** tab.

2. Click **Results 1 > Columns** or **Results 2 > Columns** in the navigation bar, as appropriate.

There are three areas to the screen; a list of **Available Results**, a list of **Selected Results**, and an area to view and change the column display for each of the **Selected Results**.

Available Results

The list of **Available Results** is organized in a hierarchy according to the parameter type from which they are derived. A result can be a calculated value or it can be a value of a parameter that you set up in the test method.

- **Calculation name** - each calculation forms its own hierarchy of results. Calculation names appear at the top of the list, in the order that was set up in the **Calculations Setup** dialog box. This is the order in which they will be calculated.

- **General, Text Inputs** and **Number Inputs** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Test** parameters made available depend upon the test type and control options that you set up in the **Control - Test** screen.

- **Strain** parameters made available depend upon the test type and options that you set up in the **Control - Strain** screen. For example, there are no strain parameters for a Peel, Tear and Friction test type.

You can expand and collapse the hierarchy by clicking on the "+" and "-" signs.

Show All Parameters

This box is normally unchecked and the **Available** list contains only those parameters that are appropriate for your chosen specimen geometry, test fixtures, test type and control options. If you check this box, all parameters are shown in the list, even though they may not be appropriate for the current test setup. Such parameters are shown in italics. You can add any of these parameters to the **Selected** list.

The **Results Table** component of the test workspace will have a column allocated to that result. If the parameter is invalid for a particular specimen, the table cell for that result is blank.

The **Show all parameters** checkbox is a global setting and is applied to all the lists of parameters and channels in all screens.

Selected Results

To add an item to the **Selected Results** list, click on its name in the **Available Results** list and click the **Add** button.

The result columns appear in the table in the same order that the results appear in the **Selected Results** list. If you want to change the order, highlight an item in the **Selected** list and click on the **Move up** or **Move down** button to change its position in the list.

*You can click and drag parameters between the **Available** and **Selected** lists. You can also click and drag parameters to change their order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

When you click on a result in the **Selected Results** list, the attributes for that result column appear below the list. Any changes that you make to these attributes affect only the currently-selected result column. In general, the following fields appear for any numeric value in the result table:

- **Heading** - this text matches the name of the result that you have selected but you can change it to anything you like. Although the text wraps to fit, you may want to abbreviate the description to fit in a particular column width.

- **Units** - this choice matches the units that you have set for the chosen parameter but you can change to different units for a particular result, if you like.

- **Rounding format** - the default choice for this field is **Decimal places**, but you can also choose **Significant figures** or a customized format associated with the test method. Depending on the choice that you make here, an additional field may appear to let you set the appropriate value.

  - **Decimal places** - set this value to the number of decimal places that you want for this result.

  - **Significant figures** - set this value to the number of significant figures that you want for this result. For example, if you set this value to 5 then a value of 103.5623 displays as 103.56.

  - Customized formats created for the test method. You can create rounding formats to meet specific requirements. In the **Method** tab, click on **Calculations**, **Rounding** to create a customized rounding rule. All available rules shown on the **Setup Rounding Rules** screen display in this **Rounding format** field and can be applied to the selected result.

- **Apply format to all statistics** - Applies the column format that you selected for the results to all the statistics for those results.

  There are two statistics, standard deviation and coefficient of variation, where you can set the number of decimal places. The other statistics automatically default to the result's format. If you want these two statistics to use the same format as the result, check this box. These two statistics will then display in the same format that you have chosen for that result. If you uncheck this box, the formats for these two statistics revert to the settings selected in the **Setup Results Table Statistics** screen.

- **Acceptance Range** - you may want to set up an acceptance range to indicate if a calculated result falls outside a particular range of values that are acceptable for you. You define the range in the **Upper** and **Lower** fields then you enable the feature by checking one or both of the **Apply to each specimen** or **Apply to sample mean and median** boxes. Any value that falls outside the range defined is indicated in the **Results Table** in the test workspace by a red arrow adjacent to the value. If the value is too high, the arrow points upwards, if it is too low, the arrow points downwards.

- **Reset** button - clicking on this button resets the **Heading** and **Decimal places** to their system default values and unchecks the boxes within the **Acceptance Range** area. It does not, however, change any values that you have set for the **Acceptance Range** or the **Units** that you have set.

Settings that can be changed in the test workspace

You cannot change the content of the **Available Results** or **Selected Results** lists.

You can change the order of the columns in the table. You can also change the attributes of a selected result column (heading, units, decimal places, acceptance range).

*If Security is enabled, and the operator does not have rights to go to the **Method** tab, the ability to change the attributes of a result column is not available in the test workspace.*

Refer to "Results and statistics table screen component" on page 5-19 for more information about making changes from the test workspace.

Setup Results Table Statistics

This screen is where you set up the statistics for each of the two results tables, which appear on the test workspace. Each table has its own setup screen, **Table 1 Statistics** and **Table 2 Statistics**, and they operate in exactly the same way.

Access and layout

To open the **Setup Results Table - Statistics** screen:

1. Click on the **Method** tab.

2. Click **Results 1 > Statistics** or **Results 2 > Statistics** in the navigation bar, as appropriate.

There are three areas to the screen; a list of **Available Statistics**, a list of **Selected Statistics**, and an area where you can view and change the way the statistic displays in all tables.

*When you change the **Name** or **Decimal places** for a particular statistic, that change is applied to both statistics tables.*

Available Statistics

The list of **Available Statistics** is organized in a hierarchy.

- **General** contains the more commonly used statistics.

- **Mean + Standard Deviation** contains statistics composed of mean plus up to six standard deviations.

- **Mean - Standard Deviation** contains statistics composed of mean minus up to six standard deviations.

You can expand and collapse the hierarchy by clicking on the "+" and "-" signs.

Selected Statistics

To add an item to the **Selected Statistics** list, click on its name in the **Available Statistics** list and click the **Add** button.

The statistics appear in the table in the same order that the statistics appear in the **Selected Statistics** list. If you want to change the order, highlight an item in the **Selected** list and click on the **Move up** or **Move down** button to change its position in the list.

*You can click and drag parameters between the **Available** and **Selected** lists. You can also click and drag parameters to change their order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

When you click on a result in the **Selected Statistics** list, the attributes for that statistics column appear below the list. Any changes that you make to these attributes affect only the currently-selected statistics column. In general, the following are the attributes that appear for statistics and you can set them as required:

- **Heading** - this text matches the name of the result that you have selected but you can change it to anything you like. Although the text wraps to fit, you may want to abbreviate the description to fit in a particular column width.

- **Rounding format** - the default choice for this field is **Decimal places**, but you can also choose **Significant figures** or a customized format associated with the test method. Depending on the choice that you make here, an additional field may appear to let you set the appropriate value. T

- **Decimal places** - set this value to the number of decimal places that you want for this statistic.

- **Significant figures** - set this value to the number of significant figures that you want for this statistic. For example, if you set this value to 5 then a value of 103.5623 displays as 103.56.

- Customized formats created for the test method. You can create rounding formats to meet specific requirements. In the **Method** tab, click on **Calculations**, **Rounding** to create a customized rounding rule. All available rules shown on the **Setup Rounding Rules** screen display in this **Rounding format** field and can be applied to the selected statistic.

- **Reset** button - clicking on this button resets the **Heading** and **Rounding format** to their system default values.

Settings that can be changed in the test workspace

You cannot change the content of the **Selected Statistics** list.

You can change the attributes of a selected statistic (heading, decimal places).

Refer to "Results and statistics table screen component" on page 5-19 for more information about making changes from the test workspace.

Setup Results Table Format

This screen is where you set up the appearance for each of the two results tables, which appear on the test workspace. Each table has its own setup screen, **Table 1 Format** and **Table 2 Format**, and they operate in exactly the same way.

Access and layout

To open the **Setup Results Table - Format** screen:

1. Click on the **Method** tab.

2. Click **Results 1 > Format** or **Results 2 > Format** in the navigation bar, as appropriate.

Ideally, you should have already set up content for the **Columns** and **Statistics**, then the example table in the center of the screen displays the choices you have made. The calculated values in the table are not real, they are for illustration purposes only.

Choose a table style

Select a style for the table in the **Table styles:** field.

As you click on each one of the table styles in the list, the example table changes to show the selected style.

Choose font formats

To format the fonts:

1. In the **Table element:** list box, select **Column Headings**.

2. To select a font, click the Open Font Dialog button to the right of the list box.

3. Format the font as desired using the remaining format buttons.

4. Repeat Step 1 through 3 for the **Body** format.

Choose viewing options

A checkbox lets you choose to display or hide the results for excluded specimens in the tables.

In the section **Show in test workspace**, you can choose what information you want to show in the tables:

• Results and statistics

• Results only

• Statistics only

The setting for excluded specimens is global. If you choose to show excluded specimens in one results table the setting also applies to the other results table and to any graph that you set up.

Formatting that can be changed in the test workspace

You can manually change each column width and all of the viewing options are available. You can also choose to show or hide excluded specimens. Two additional controls that are only available in the test workspace let you reset all the columns back to the default width or automatically size each column according to its content.

You cannot change the table style or any of the formatting for the table headings or body.

Refer to "Results and statistics table screen component" on page 5-19 for more information about making changes from the test workspace.

Graph 1 and Graph 2 menu items

The **Graph 1** and **Graph 2** menus on the navigation bar for the **Method** tab contain the following menu items:

- Type

- X-Data

- Y-Data

- Advanced

Setup Graph Type

This screen lets you choose the type of graph that you want to display in the test workspace. If you have purchased the optional Reports and Graphs Pack, you can display two graphs. Each graph has its own set of setup screens, **Graph 1** and **Graph 2**.

How does it work?

You can open the **Setup Graph Type** screen from two different locations in the software:

- In the **Method** tab, click **Graph > Type** in the navigation bar.

- In the **Test** tab, right-click in the **Graph** area of the workspace to open the **Properties** dialog. If necessary, click on the **Type** tab in the dialog.

In the screen that appears within the **Method** tab, there are two areas; a setup area at the top and a preview at the bottom. As you make changes in the setup area, the preview updates to show the changes that you have made.

If you have not purchased the optional Reports and Graphs Pack, the Multi-specimen graph is the only graph type available to you.

Setup for the multi-specimen graph type

If you choose this graph type, several fields appear for you to set up.

Graph title

The default title of the graph

Specimen %n of %m

Graph 1 and Graph 2 menu items

indicates the range of specimen numbers in each graph. %n is the first curve to be plotted in any graph and %m is the last curve to be plotted. Therefore, as each curve is drawn, %n remains constant and %m increments each time a curve is drawn until the number of curves per graph is reached. A new graph then displays with new values of %n and %m.

You can enter different text for the graph title. You can use the %n and %m identifiers in your title, if you wish.

Curves per graph

This controls the number of curves that are drawn before the graph in the test workspace clears. If the number is 4, the graph clears before testing specimen number 5.

When setting the number of curves per graph, you need to balance the need to see each curve clearly against the number of graphs that might be produced if there are a large number of specimens in your sample. If you choose to include the graph in any report that you produce, multiple graphs will be drawn in the report if needed to display all the curves. For example, if you have 25 specimens and have chosen 4 curves per graph, a total of 7 graphs will be drawn in the report; 6 graphs containing 4 curves in each, and one graph containing one curve.

Offset each curve by

To reduce the amount of curve overlap, the software can offset the origin of each curve. The default setting, **Auto**, offsets each curve along the x-axis by an amount determined by the software. Other options are:

No overlap	Offsets each curve along the x-axis so that each curve begins where the previous curve ends.
3D	Offsets each curve along both the x-axis and the y-axis.
None	No curves are offset.

Show excluded specimens

This setting is global and controls whether any excluded specimens appear in the graph and results table. If you choose to show them, any excluded specimens are shown in both the graph and the results table. The curve of an excluded specimen is not distinguished visually from any other curves in the graph. However, it is indicated in the results table and the specimen selector by a red cross adjacent to the specimen number.

Enable data point selector

Check this box to enable the display of the data point selector in the **Graph** component of the test workspace. This control lets you click on a point on the graph and display the coordinates of that point. Once a point is marked, you can use the arrow keys on the

keyboard to move up and down the curve, one data point at a time if necessary, to find a specific data point. If you have the **Raw Data Table** component as part of your workspace, the software highlights the row in the table that corresponds to the selected data point. If you also have the **Web Camera** component as part of your workspace, the software displays the closest video frame that corresponds to the selected data point.

Setup for the Double Y-axis graph type

If you choose this graph type, there can only be one specimen per graph. The default title of the graph is the specimen number, but you can enter a different title, if you wish.

This option is only available if you have the optional Reports and Graphs Pack.

Setup for the Multi-channel graph type

If you choose this graph type, there can only be one specimen per graph. The default title of the graph is the specimen number, but you can enter a different title, if you wish.

This option is only available if you have the optional Reports and Graphs Pack.

Setup Graph X-data

This screen lets you set up the basic parameters for the x-axis of your graph. If you want to set up more than the basic axis definition and scaling, go to the **Setup Advanced Graph Styles** screen where you can change the axis title and select custom colors and symbols for the curves in the graph.

How does it work?

You can open the **Setup Graph X-data** screen from two different locations in the software:

- In the **Method** tab, click **Graph > X-data** in the navigation bar.

- In the **Test** tab, right-click in the **Graph** area of the workspace to open the **Properties** dialog. If necessary, click on the **X-data** tab in the dialog.

In the screen that appears within the **Method** tab, there are two areas; a setup area at the top and a preview at the bottom. As you make changes in the setup area, the preview updates to show the changes that you have made.

Graph 1 and Graph 2 menu items

X-axis definition

Choose the channel that you want displayed on the x-axis. You can also set the units for the x-axis.

X-axis scaling

Choose the type of scaling that you want for the x-axis.

Automatic scaling works by adjusting the axis as the first specimen is tested to show the entire curve for that axis. On a multi-specimen graph, the axis is adjusted as each specimen is tested. If all axes are set to automatic scaling, the software adjusts the axes so that the entire curve for all specimens is visible. Automatic scaling is the default choice.

If you do not want to see the entire curve, perhaps because you want to see detail in a particular portion of the curve, you can set the scaling to **Manual**. When you select **Manual**, two extra fields display to let you set the maximum and minimum values for the x-axis.

Profile segments (Tension and Compression TestProfiler methods only)

If you are working with a TestProfiler method, your test is divided into segments. You can choose which segments to include in the graph. The default choice is to include all segments.

To select one or more specific segments, click on the first segment that you want to include and, while holding down the CTRL key on the keyboard, click on any other segments to select them. To select a number of segments that appear together in the list, click on the first segment and, while holding down the SHIFT key on the keyboard, click on the last segment to select the entire block. Click the **Select All** button to select all the segments.

Setup Graph Y-data

This screen lets you set up the basic parameters for the y-axis of your graph. If you want to set up more than the basic axis definition and scaling, go to the **Setup Advanced Graph Styles** screen where you can change the axis title and select custom colors and symbols for the curves in the graph.

How does it work?

You can open the **Setup Graph Y-data** screen from two different locations in the software:

- In the **Method** tab, click **Graph > Y-data** in the navigation bar.

- In the **Test** tab, right-click in the **Graph** area of the workspace to open the **Properties** dialog. If necessary, click on the **Y-data** tab in the dialog.

In the screen that appears within the **Method** tab, there are two areas; a setup area at the top and a preview at the bottom. As you make changes in the setup area, the preview updates to show the changes that you have made.

Setup Y1 Axis

Y1-axis definition

Choose the channel that you want displayed on the y-axis. You can also set the units for the y-axis.

If you have chosen the Multi-channel graph type, you can plot more than one channel on the y-axis. A list of channels displays and you check the ones that you want to include. You cannot set the units for the y-axis for this graph type because each channel has its own units. You should select the units for each channel so that the curves for each channel are of the same order of magnitude.

Y1-axis scaling

Choose the type of scaling that you want for the y-axis.

Automatic scaling works by adjusting the axis as the first specimen is tested to show the entire curve for that axis. On a multi-specimen graph, the axis is adjusted as each specimen is tested. If all axes are set to automatic scaling, the software adjusts the axes so that the entire curve for all specimens is visible. Automatic scaling is the default choice.

If you have chosen the Multi-channel graph type, only one specimen appears on each graph and the maximum on the y-axis is determined by the highest value required to plot all of the channels that you have chosen.

If you do not want to see the entire curve, perhaps because you want to see detail in a particular portion of the curve, you can set the scaling to **Manual**. When you select **Manual**, two extra fields display to let you set the maximum and minimum values for the y1-axis.

If you have chosen the Multi-channel graph type, the values of minimum and maximum are without units as each channel has its own units. The values apply to each channel in the units for that channel. For example, if you have chosen two channels for the y-axis (Load in newtons, and Time in seconds) and have set the maximum value to 500, then Load is plotted on an axis with a maximum of 500N and Time is plotted on an axis with a maximum of 500 seconds.

Graph 1 and Graph 2 menu items

Setup Y2 Axis (Double Y-axis graph type)

This option is only available if you have the optional Reports and Graphs Pack.

Y2-axis definition

Choose the channel that you want displayed on the second y-axis. You can also set the units for the second y-axis.

Y2-axis scaling

Choose the type of scaling that you want for the second y-axis.

Automatic scaling works by adjusting the axis as the specimen is tested to show the entire curve for that axis. If all axes are set to automatic scaling, the software adjusts the axes so that the entire curve is visible. Automatic scaling is the default choice.

If you do not want to see the entire curve, perhaps because you want to see detail in a particular portion of the curve, you can set the scaling to **Manual**. When you select **Manual**, two extra fields display to let you set the maximum and minimum values for the y2-axis.

Setup Advanced Graph Styles

This screen lets you change many of the styles and settings for your graph, in addition to the basic choices of axes definitions and scaling.

How does it work?

You can open the **Setup Graph Advanced Styles** screen from two different locations in the software:

- In the **Method** tab, click **Graph > Advanced** in the navigation bar.

- In the **Test** tab, right-click in the **Graph** area of the workspace to open the **Properties** dialog. If necessary, click on the **Advanced** tab in the dialog.

In the screen that appears within the **Method** tab, there are two areas; a setup area at the top and a preview at the bottom. As you make changes in the setup area, the preview updates to show the changes that you have made.

How to use the list

When you highlight an item in the list on the left, all the properties available to you for that item display on the right. To change a color or a font, click on the appropriate **Edit...** button to open a setup dialog.

The following table shows the graph parameters that you can edit in this screen:

List item	What you can change
Graph Appearance	Color of background Color of axes and labels Font for graph title Font for axis titles Font for axis labels
Grid lines	Show or hide grid lines on the graph Grid line style Grid line color
X-axis	Title of the x-axis Use a logarithmic scale Reverse the axis scaling
Y-axis	Title of the y-axis Use a logarithmic scale Reverse the axis scaling
Legend settings	Show or hide the legend Legend label type (**Specimen number** or **Specimen label** for the Multi-specimen graph type, **Channel** for other graph types) Legend title (default matches the legend label type) Legend location with respect to the graph (e.g. **East** is directly to the right of the graph) Legend orientation (**vertical** or **horizontal**)
Legend appearance	Legend border style (or you can remove the border by choosing **None**) Legend border width Legend background color Legend label font
Marker styles	Symbol shape, size and color (or remove markers by choosing **None**, see Tip below). Markers appear on the graph if you have chosen the **Indicate on graph** option when setting up certain calculations. You can customize the shape, size and color of those markers in this screen. An example of a calculation that uses markers would be a Preset point.

List item	What you can change
Construction line styles	Line style and color (or remove construction lines by choosing **None**, see Tip below). Construction lines appear on the graph if you have chosen the **Indicate on graph** option when setting up certain calculations. You can customize the line style and color of those construction lines in this screen. An example of a calculation that uses construction lines would be a modulus calculation. The **Use the plot line color** box is checked by default. This sets the construction line to the same color as the plot that it appears on. If you uncheck this box, all construction lines will use the color that you have set up in this screen, that is, they will all appear in the same color.
PIP lines	Show or hide the PIP lines. Line style and color. The **Use the plot line color** box is checked by default. This sets the PIP line to the same color as the plot that it appears on. If you uncheck this box, all PIP lines will use the color that you have set up in this screen, that is, they will all appear in the same color.
Plot 1, 2, 3 and so on up to the number of curves per graph	Line style, width and color. Symbol shape, size and color.

*If you want to view the graph without markers and construction lines, it is quicker to open this screen from the test workspace and set the construction line style and marker symbol shape to **None** than to go to the **Method** tab and disable **Indicate on graph** for each calculation in the calculation setup.*

Raw Data menu items

The **Raw Data** menu on the navigation bar for the **Method** tab contains the following menu items:

- Columns
- Format

Setup Raw Data Table Columns

This screen lets you choose and setup the content of the raw data table, which appears on the test workspace.

The functionality described here is accessible only if you have the optional Reports and Graphs Pack.

How does it work?

You open the **Setup Raw Data Table Columns** screen in the **Method** tab by clicking on **Raw Data > Columns** in the navigation bar.

There are three areas to the screen; a list of **Available Channels**, a list of **Selected Channels**, and an area where you can view and change the way the column is displayed for each of the **Selected Channels**.

Available Channels

The list of **Available Channels** is organized in alphabetical order.

Show All Parameters

This box is normally unchecked and the **Available Channels** list contains only those data channels that are valid for the current testing system. If you check this box, all channels are shown in the list, even though they may not be appropriate for the current test setup. Such channels are shown in italics. You can add any of these channels to the list of **Selected Channels**.

The **Raw Data Table** component of the test workspace will have a column allocated to that channel. If the channel is invalid for a particular specimen, the table column for that channel is blank.

The **Show all parameters** checkbox is a global setting and is applied to all the lists of parameters and channels in all screens.

Selected Channels

To add an item to the **Selected Channels** list, click on its name in the **Available Channels** list and click the **Add** button.

The data columns appear in the table in the same order that the channel names appear in the **Selected Channels** list. If you want to change the order, highlight an item in the **Selected** list and click on the **Move up** or **Move down** button to change its position in the list.

*You can click and drag items between the **Available** and **Selected** lists. You can also click and drag items to change their order in the **Selected** list.*

*Double-click on an item in the **Available** list to add it to the **Selected** list.*

When you click on a channel in the **Selected Channels** list, the attributes for that data column appear below the list. Any changes that you make to these attributes affect only the

currently-selected data column. In general, the following fields appear for any numeric value in the raw data table:

- **Heading** - this text matches the name of the channel that you have selected but you can change it to anything you like. Although the text wraps to fit, you may want to abbreviate the description to fit in a particular column width.

- **Units** - this choice matches the units that you have set for the chosen parameter but you can change to different units for a particular result, if you like.

- **Rounding format** - the default choice for this field is **Decimal places**, but you can also choose **Significant figures** or a customized format associated with the test method. Depending on the choice that you make here, an additional field may appear to let you set the appropriate value:

  - **Decimal places** - set this value to the number of decimal places that you want for this channel.

  - **Significant figures** - set this value to the number of significant figures that you want for this channel. For example, if you set this value to 5 then a value of 103.5623 displays as 103.56.

  - Customized formats created for the test method. You can create rounding formats to meet specific requirements. In the **Method** tab, click on **Calculations**, **Rounding** to create a customized rounding rule. All available rules shown on the **Setup Rounding Rules** screen display in this **Rounding format** field and can be applied to the selected channel.

- **Reset button** - clicking on this button resets the **Heading** and **Decimal places** to their system default values. It does not change the **Units** that you have set.

Can any of these settings be changed in the test workspace?

You cannot change the content of the **Selected Channels** list.

You can change the order of the columns in the table. You can also change the attributes of a selected data column (heading, units, decimal places).

If Security is enabled, and the operator does not have rights to go to the **Method** *tab, the ability to change the attributes of a data column is not available in the test workspace.*

Refer to "Raw data table screen component" on page 5-21 for more information about making changes from the test workspace.

Setup Raw Data Table Format

This screen lets you set up the appearance of the raw data table, which appears on the test workspace.

The functionality described here is accessible to you only if you have purchased the optional Reports and Graphs Pack.

How does it work?

You open the **Setup Raw Data Table Format** screen in the **Method** tab by clicking on **Raw Data > Format** in the navigation bar.

Ideally, you should have already set up content for the **Columns**, then the example table in the center of the screen displays the choices you have made. The values in the table are not real, they are for illustration purposes only.

Choose a style for the table

As you click on each one of the **Table styles** in the list, the example table changes to show the style that you have chosen.

Choose formats for the column headings and the body of the table

When you select **Column Headings** in the **Table element** list box, you can use the buttons to the right of the list box to set the font characteristics and justification options. When you select **Body**, the justification buttons are not available.

Choose viewing options

A checkbox lets you choose to display or hide the data for excluded specimens.

The setting for excluded specimens is global. If you choose to show excluded specimens in the raw data table the setting also applies to the results tables and to any graph that you set up.

What aspects of formatting can be changed in the test workspace?

You can manually change each column width and you can choose to show or hide excluded specimens. Two additional controls that are only available in the test workspace let you reset all the columns back to the default width or automatically size each column according to its content.

You cannot change the table style or any of the formatting for the table headings or body.

Refer to "Raw data table screen component" on page 5-21 for more information about making changes from the test workspace.

Reports menu items

The **Reports** menu on the navigation bar for the **Method** tab contains the following menu items:

- Documents
- Export Results
- Export Raw Data
- Defaults Table

The selections made on these screens determine the output files that the system generates when you finish a sample.

Setup Document Outputs

This screen lets you choose what types of output you want to produce from your testing. Output files include the results, raw data and report files for your sample. When you finish a sample, the system generates the output that you select on this screen. The system saves the output files in the same location as the sample data file.

To edit the report file settings:

1. "Open a test method file". If a sample is open, then click on the **Method** tab.

2. Click **Reports > Documents** in the navigation bar.

   The **Setup Document Outputs** screen displays.

3. Select a report template in the **Template** field. Click **Change...** to select a different template.

4. To save the report file, select **Save the document** and select a format in the **Document format** field.

5. To email the report to others, select **Email the document** and enter the information in the associated fields. Refer to "Email the report" on page 4-62.

6. To print the report, select **Print the document**.

7. To print the graphs from the workspace independently from the report, select the graph under **Print Graphs**.

8. To define a default path for the test method, select **Specify Output Path** and enter a path to the directory where you want to save both the sample and its associated output files. Click **Browse...** to find the directory.

Select a report template

The **Report template** field contains the file name of the report template that is currently associated with the test method. If you have the optional Reports and Graphs Pack, you can create and edit your own report templates in the **Report** tab.

If you do not have the optional Reports and Graphs pack, a preview of the report contents is available when you click **Change...**. The **Open File** dialog box displays. Select **Show Preview** to see a description of the report and a list of the elements included in the report template.

To see how the report looks using a particular template, select the template in the **Template** field and click **Print** in the lower right corner to open the **Print** dialog box. Click **OK** in the **Print** dialog box to open a window that displays a preview of the report. You can then choose to **Print** or **Cancel** from the preview window.

Save the report

Saving the report in a separate file lets you view the report from the file directory rather than opening the Bluehill® software.

To save a report to a file, select **Save the document** and select a format in the **Document format** field.

PDF (the default)	Portable Document Format (readable using Adobe Acrobat reader)
MS Word	Microsoft Word
HTML	Hypertext Markup Language (used in Web pages)

If you do not select **Save the document**, the system does not generate a report file when you finish a sample.The system saves the information with the sample, so you can open the sample to view the report, if necessary.

Email the report

To have the system email the report when finishing a sample:

1. Select a document format.

To email the document, do not choose HTML as the document format.

2. Select **Save the document**.

3. Select **Email the document**.

4. Enter the title in the **Email title** field.

5. Enter email addresses in the **Email to** field.

6. Enter a message in the **Email message** field.

*To specify the email recipients, title and a message at the end of testing rather than in the test method, set up the test method as a prompted test and add these items to the **At Finish** screen. When Bluehill® security is enabled, an operator can email the report when using the prompted test format. Refer to the "Setup Test Prompts - Overview" on page 9-1 for more information.*

To send email directly from Bluehill, the email function must be set up on the **Admin** tab. Refer to "Email Preferences" on page 3-9.

Print graphs

These controls let you print copies of the graph independently of the report when you finish the sample. To have the system print copies of the graph, select the graph under **Print Graphs**. The number of graphs printed is the same as the number of graphs displayed in the workspace and depends upon the number of specimens in the sample and the number of curves per graph.

Change output path

When you finish a sample, the system creates the specified output files and saves them to the location you specified in step 2 of the Create a New Sample process. To specify a default path for the test method, select **Specify output path** and enter a path in the **Output path** field. Whenever this test method is used, the default path entered here displays in step 2 of the Create a New Sample process.

When you run tests and create files to output (sample files, report files, ASCII files, for example), you choose the location for those files in the **Name the New Sample** screen, step 2 of the Create a New Sample process. The system makes a suggestion for the location based on the last location that you chose or, if you are using the software for the first time, the default location that you chose at installation. You can change the location in that screen.

If you check the **Specify output path** box, you can choose a path (in the **Output path** field) for all the output files created for a sample. and save it with the test method. Whenever you choose that method in step 1 of the Create a New Sample process, the default path for the sample file (and thus all the other output files) in step 2 is the path that is specified here.

This feature is useful when a number of people use the testing system, each one having their own test methods and their own locations for any output.

Setup Results Export

Most of the functionality described here is only available if you have the optional Reports and Graphs Pack. If you do not have this option, only the Classic format is available.

The selections made on this screen determines the content and format for the results output file that the system generates for a finished sample. When this feature is enabled, you can specify the format for the results output file and include additional default information. If you do not enable this feature, then the system does not generate a results output file. The system saves the results with the sample, so you can always open the sample to view this information.

The system exports the results file to the same location as the sample.

To select the export settings for the results output file:

1. "Open a test method file". If a sample is open, click on the **Method** tab.

2. Click **Reports > Export Results** in the navigation bar.

    The **Setup Results Export** screen displays.

3. Select **Export results** to enable this feature.

4. Select a format in the **Format** field.

    If you select **Classic (.RLT)**, there are no more fields on the screen. Refer to "Export results format and content".

5. In the **Content** field, select the type of results you want to export.

6. Select the default information that you want to include in the results output file. Refer to "Include default information for the sample".

Export results format and content

The content of the exported results is determined by the selections made in the **Results** section of the **Method** tab.

The **Comma Separated Values (.CSV)** or **Database** formats have additional settings. Refer to "Export File Settings" on page 3-8 to edit these settings.

The **Classic (.RLT)** format stores the results in a file format that is identical to that used in Merlin software. There are some minor differences between the content of the new Bluehill® .RLT files and the old Merlin .RLT files. These are described in detail in the "RLT file reference" on page 7-13.

Include default information for the sample

This area of the screen appears for the **Comma Separated Values (.CSV)** or **Database** formats. Each parameter shown in the **Selected** list, and its associated default value, are exported to the header of the results export file. This feature lets you show parameters in the results export file that cannot be added to the results table, or show parameters from the test method that do not change from specimen to specimen.

The content of the list, and the process, is the same as for setting up a Defaults Table.

Setup Raw Data Export

Most of the functionality described here is only available if you have the optional Reports and Graphs Pack. If you do not have this option, only the Classic format is available.

The selections made on this screen determines the format for the raw data output file that the system generates for a finished sample. When this feature is enabled, you can specify the format for the raw data output file. If you do not enable this feature, then the system does not generate a raw data output file. The system saves the raw data with the sample, so you can always open the sample to view this information.

The system exports the raw data file to the same location as the sample.

To select the export settings for the raw data output file:

1. "Open a test method file". If a sample is open, click on the **Method** tab.

2. Click **Reports > Export Raw Data** in the navigation bar.

   The **Setup Raw Data Export** screen displays.

3. Select **Export raw data** to enable this feature.

4. Select a format in the **Format** field.

   If you select **Classic (.RAW)**, there are no more fields on the screen. Refer to "Export raw data format and content".

5. Select additional specimen results to include in the raw data output file, if required. Refer to "Include additional specimen results".

Export raw data format and content

The content of the exported raw data file is determined by the selections made in the **Raw Data** section of the **Method** tab.

The **Classic (.RAW)** format is exported to the same location as the sample. If you select the **Comma Separated Values (.CSV)** format, then the system generates a separate raw data export file for each specimen in the sample and exports these files to a subdirectory within that same location. The system names the files using the following format:

```
<samplename>_RawData
```

Refer to "Change output path" on page 4-63 for more information on designating an output directory.

The **Comma Separated Values (.CSV)** format has additional settings. Refer to "Export File Settings" on page 3-8 to edit these settings.

Include additional specimen results

This area of the screen appears for the **Comma Separated Values (.CSV)** format. The value for each result shown in the **Selected** list is exported to the header of the raw data export file for each individual specimen. The content of the lists and the way you use them is the same as for setting up the Results Table Columns. Refer to "Setup Results Table Columns" on page 4-43.

The content of the **Available** list is the same as the **Available** list in the **Setup Results Columns** screen. The list of **Selected Results** for this export, however, is completely independent of the list of **Selected Results** that makes up the Results table.

Setup Defaults Table

This screen lets you construct a table containing parameters from the test method that do not change from specimen to specimen. The default table shows these parameters and the default value that is designated in the test method. It provides an efficient way of including these parameters in the report while showing the value only once. The defaults table must be included in the report content for it to show in the report. Refer to "Setup Report Template - Body" on page 6-8.

For example, if you run all tests at the same rate, you can add **Rate** to the defaults table so that it displays only once in the report rather than have a column in the results table that contains the same rate for every specimen.

You can also add parameters to the defaults table that cannot be added to the results table. Such parameters include End of Test Criteria or Extensometer Removal Criteria. The defaults table can show these criteria in the report.

To add parameters to the defaults table:

1. "Open a test method file". If a sample is open, click on the **Method** tab.

2. Click **Reports > Defaults Table** in the navigation bar.

   The **Setup Defaults Table** screen displays. The parameters shown in the **Selected** list display in the defaults table, and in the report, in the same order that they appear in the **Selected** list.

3. To add an item to the **Selected** list, select it in the **Available** list and click **Add**.

4. To change the order of the **Selected** list, select an item and click **Move up** or **Move down**.

*You can click and drag parameters between the **Available** and **Selected** lists. You can also click and drag parameters to change their order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Available Parameters

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **General, Text Inputs, Number Inputs, Notes,** and **Documents** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Preload** and **Precycling** parameters made available depend upon the test type and control options that you set up in the **Control - Pre-Test** screen.

- **Test** parameters made available depend upon the test type and control options that you set up in the **Control - Test** screen.

- **End of Test** and **End of Hold** parameters made available depend upon the test type and control options that you set up in the **Control - End of Test** screen.

- **Data** parameters made available depend upon the test type and control options that you set up in the **Control - Data** screen.

- **Strain** and **Extensometer Removal** parameters made available depend upon the test type and options that you set up in the **Control - Strain** screen.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Show All Parameters

This box is normally unchecked and the **Available** list contains only those parameters that are appropriate for your chosen specimen geometry, test fixtures, test type and control options. If you check this box, all parameters are shown in the list, even though they may not be appropriate for the current test setup. Such parameters are shown in italics. You can add any of these parameters to the **Selected** list.

The **Defaults Table** will have a row allocated to that parameter. If the parameter is invalid for a particular sample, it will not appear in the report.

The **Show all parameters** checkbox is a global setting and is applied to all the lists of parameters and channels in all screens.

Show Category Names

This box is normally checked and when a parameter is added to the **Selected** list, its name appears preceded by the category to which it belongs. If you uncheck the box, only the parameter name appears in the **Selected** list. For example,

```
Dimension: Geometry
```

becomes

```
Geometry
```

if the box is unchecked. The parameter names appear in the Defaults table exactly as they appear in the **Selected** list.

The system includes the category name to ensure that each parameter name is unique. For example, there is a **Criteria** field in the **Setup Control - End of Test** screen and a **Criteria** field for extensometer removal in the **Setup Control - Strain** screen. The criteria field names are not editable so the only way to distinguish them is to add the category name to the parameter name.

Test Prompts menu items

The **Test Prompts** menu on the navigation bar for the **Method** tab contains the following menu items:

- Prompt Sequence
- Test Workspace

Setup a prompted test sequence

The prompted test is a sequence of test steps, rather like a wizard, that overlays the test workspace during testing. The **Setup Prompted Test Sequence** screen lets you set up the number of steps in the wizard. The **Test Prompts** screens let you set up the content of each screen within the wizard. The prompted test provides a logical linear progression of screens, directing the operator to enter certain parameters at certain points in a test sequence.

If a test method is set up as a prompted test, that method will always run as a prompted test. When a Preview of that test method appears in the **Open Method** screen, the system identifies it as a prompted method by the 🐾 icon.

How does it work?

Open the **Setup Prompted Test Sequence** screen in the **Method** tab by clicking on **Test Prompts > Prompt Sequence** in the navigation bar.

Run as a prompted test

This checkbox is the master switch for the prompted test. When you check this box, more fields and checkboxes appear to select the screens that will make up the prompted test sequence.

Number of specimens in sample

The prompted test lets you set a number of specimens for a sample and then prompts the operator when that number have been tested. As the testing progresses, the caption at the top of the screen shows the operator the number of the current specimen, for example **Specimen 2 of 10**. After the last specimen is tested, the system prompts the operator either to finish the sample or continue testing beyond the number of specimens originally specified. The prompt to finish the sample appears only once. If the operator chooses to continue testing, the sample continues until the operator finishes by clicking the **Finish** button in the test workspace.

You cannot disable this feature. If you do not want to set a number of specimens in advance of testing, there are three options:

1. Leave the default setting of 10 and instruct your operator to continue testing when prompted. After the prompt, the caption continues to show the specimen number, but not the total number of specimens in the sample, e.g. **Specimen 11**.

2. Set the **Number of specimens in sample** to a number higher than the largest number of specimens that you test in one sample. The caption shows both the specimen number and the total number that you have set, e.g. **Specimen 11 of 99**.

3. If you don't know in advance what the number will be, but the operator will know before starting to test the sample, add the **Number of specimens in sample** parameter to the list of **Selected Parameters** in the **Before Start** screen.

Prompt and Show Checkboxes

Each **Prompt** checkbox corresponds to one screen in the series of screens that make up the prompted test sequence. When you check a box, a corresponding item appears in the navigation bar, under **Test Prompts**, where you can set up the parameters that you want to add to that screen in the test sequence. Full details of how to add and set up these screens are in the topics describing each screen.

Each **Show** checkbox corresponds to a point in the test sequence where you might want the software to pause to let the operator look at the graph or results table in the test workspace.

Refer to "Setup a prompted test - Examples" on page 9-5 for example scenarios and test sequences using the prompted test.

Setup Test Prompts - Before Start

*This screen is available only when you check the **Run as a prompted test** and the **Prompt before start** boxes in the **Setup Prompted Test Sequence** screen. When you check these boxes, **Before Start** appears in the navigation bar under **Test Prompts**. Click on **Before Start** to display this screen and set up this step in your prompt sequence.*

Prompt before start is one of the steps available in the prompted test sequence and the **Setup Test Prompts - Before Start** screen lets you set up the parameters that are available for this step and provide instructions for the operator.

Prompt before start

Add any text that you want to appear on the screen to prompt the operator.

Lists of parameters

This is where you choose the parameters that you want the operator to enter before starting to test any specimens. You choose parameters from the **Available** list and add them to the **Selected** list.

What type of parameters are available?

Parameters that are sample-related, such as **Sample Description** and **Sample Notes**, are available. They are also available in the **At Finish** screen, if you prefer to have the operator

enter them at the end of testing. They are not available in any other screens because they relate to the entire sample.

The **Number of specimens in sample** parameter is available only in this screen.

If you have parameters that apply to specimens, but remain constant for every specimen, you can add them to the **Selected** list here. This means that the operator only needs to enter the value once, at the beginning of the sample. If there is any chance that the value might vary, however, you should add the parameter to the **Before Specimen** screen so that the operator can enter a value for each specimen.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **General, Notes, Text Inputs** and **Number Inputs** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Test** and **Strain** parameters made available depend upon the test type and control options that you set up in the **Setup Control - Test** screen.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

To allow an operator to view the value of a parameter, but not change it:

1. Click on a parameter in the **Selected** list.

2. Check **View only**.

The parameter name and value display in the prompted screen, but the operator cannot change the value.

Setup Test Prompts - Before Specimen

*This screen is available only when you check the **Run as a prompted test** and the **Prompt before specimen** boxes in the **Setup Prompted Test Sequence** screen. When you check these boxes, **Before Specimen** appears in the navigation bar under **Test Prompts**. Click on **Before Specimen** to display this screen and set up this step in your prompt sequence.*

The **Prompt before specimen** is one of the steps available in the prompted test sequence and the **Setup Test Prompts - Before Specimen** screen lets you set up the parameters that are available for this step and provide instructions for the operator.

Prompt before specimen

Add any text that you want to appear on the screen to prompt the operator.

What type of parameters are available?

Parameters that are related to individual specimens, such as any **Dimensions** and **Specimen Notes**, are available.

Parameters that you should add to the **Selected** list in this screen are those where the value is different for each specimen in the sample.

If you have parameters that apply to individual specimens, but remain constant for every specimen, you should add them to the **Before Start** screen so that the operator only needs to enter the value once, at the beginning of the sample.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **Notes, Text Inputs** and **Number Inputs** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Test** and **Strain** parameters made available depend upon the test type and control options that you set up in the **Setup Control - Test** screen.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

To allow an operator to view the value of a parameter, but not change it:

1. Click on a parameter in the **Selected** list.

2. Check **View only**.

The parameter name and value display in the prompted screen, but the operator cannot change the value.

Setup Test Prompts - Before Test

*This screen is available only when you check the **Run as a prompted test** and the **Prompt before test** boxes in the **Setup Prompted Test Sequence** screen. When you check these boxes, **Before Test** appears in the navigation bar under **Test Prompts**. Click on **Before Test** to display this screen and set up this step in your prompt sequence.*

The **Prompt before test** is one of the steps available in the prompted test sequence and the **Setup Test Prompts - Before Test** screen lets you set up the parameters that are available for this step and provide instructions for the operator.

This screen is the only screen in the prompted test sequence where you can start a test.

Prompt before test

Add any text that you want to appear on the screen to guide the operator. You might want to include a reminder to attach an extensometer or a safety-related message to keep clear of the machine before pressing the Start Test button.

What type of parameters are available?

Parameters that are related to individual specimens, such as any **Dimensions** and **Specimen Notes**, are available.

The same parameters are available for both the **Before Specimen** and **Before Test** screens in the test sequence. This gives you the option to allow the operator to enter parameters and start a test from the same screen, or allow the operator to enter parameters on the **Before Specimen** screen and then only display instructions for the operator on the **Before Test** screen.

Parameters that you should add to the **Selected** list in this screen are those where the value is different for each specimen in the sample.

If you have parameters that apply to individual specimens, but remain constant for every specimen, you should add them to the **Before Start** screen so that the operator only needs to enter the value once, at the beginning of the sample.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **Notes, Text Inputs** and **Number Inputs** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Test** and **Strain** parameters made available depend upon the test type and control options that you set up in the **Setup Control - Test** screen.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

To allow an operator to view the value of a parameter, but not change it:

1. Click on a parameter in the **Selected** list.

2. Check **View only**.

The parameter name and value display in the prompted screen, but the operator cannot change the value.

Setup Test Prompts - Before Calculations

*This screen is available only when you check the **Run as a prompted test** and the **Prompt before calculations** boxes in the **Setup Prompted Test Sequence** screen. When you check these boxes, **Before Calculations** appears in the navigation bar under **Test Prompts**. Click on **Before Calculations** to display this screen and set up this step in your prompt sequence.*

The **Prompt before calculations** is one of the steps available in the prompted test sequence and the **Setup Test Prompts - Before Calculations** screen lets you set up the parameters that are available for this step and provide instructions for the operator.

Prompt before calculations

Add any text that you want to appear on the screen to guide the operator.

What type of parameters are available?

Parameters that are related to individual specimens are available. Dimension parameters, however, now include final dimensions because when this screen appears as part of the testing sequence, the specimen will have been tested.

This is the first screen where you can add the option for the operator to exclude the current specimen from the statistics. The **Exclude** option (within the **General** category) is also available in the **After Specimen** screen.

If you need to have the operator enter final dimensions for individual specimens, prior to any calculations being performed, you should add them to the **Selected** list in this screen.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **General, Notes, Text Inputs** and **Number Inputs** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Test** and **Strain** parameters are not available because when this screen appears as part of the testing sequence, the specimen will have been tested.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

To allow an operator to view the value of a parameter, but not change it:

1. Click on a parameter in the **Selected** list.

2. Check **View only**.

The parameter name and value display in the prompted screen, but the operator cannot change the value.

Setup Test Prompts - Test Workspace Screen

The **Setup Test Prompts - Test Workspace** screen lets you choose a set of data entry fields for parameters that appear in the **Test Inputs** component of the workspace for each specimen during testing. You can then enter values for each of these parameters as you are running tests on specimens. You can use this feature to enter specimen parameters at any time, perhaps entering specimen dimensions for specimen numbers 2 through 10 while the test on specimen number 1 is running.

Why would I use it?

If you need to enter different values of a parameter for different specimens, you must add that parameter to the list of **Test Inputs**.

For example, the default value of width might be 12mm, but individual specimens may vary slightly from this. You would add **Width** to the list of **Selected Parameters** in the **Setup Test Prompts - Test Workspace** screen and enter 12mm for the default value. For each specimen that you test, the value 12mm shows up in the **Test Inputs** component of the workspace but you can enter a different value if necessary. In addition, you can restrict changes so that they are available only in a particular part of the test sequence. For example, you might want to be able to change the specimen width before that specimen is tested, but not allow it to be changed after testing.

You can use this feature as a way of entering parameters for different specimens without having to go to the fully prompted test. Refer to "Example of how to use Test Prompts in the freeform test" on page 9-4.

How does it work?

You open the **Setup Test Prompts - Test Workspace** screen in the **Method** tab by clicking on **Test Prompts - Test Workspace** in the navigation bar.

There are two areas to the screen; a list of **Available Parameters** and a list of **Selected Parameters**.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **General** parameters are always available.

- **Dimension** parameters made available depend upon specimen geometry and test fixtures that you set up in the **Specimen Dimensions** screen.

- **Control** parameters made available depend upon the test type and control options that you set up in the **Control** screens.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

If you want to set up restrictions so that changes can be made only in a particular part of the test sequence, use the following procedure:

1. Click on a parameter in the **Selected** list to highlight it.

2. Check one of the boxes (**Untested, Testing, Tested**) to prohibit changes when the specimen is in that state.

It is possible that one or more of the boxes may already be checked and grayed out. This means that you can never change the value of that parameter in that specimen state. For example, you cannot change specimen dimensions during testing and you cannot change the rate after a test has been run.

Setup Test Prompts - After Specimen

*This screen is available only when you check the **Run as a prompted test** and the **Prompt after specimen** boxes in the **Setup Prompted Test Sequence** screen. When you check these boxes, **After Specimen** appears in the navigation bar under **Test Prompts**. Click on **After Specimen** to display this screen and set up this step in your prompt sequence.*

The **Prompt after specimen** is one of the steps available in the prompted test sequence and the **Setup Test Prompts - After Specimen** screen lets you set up the parameters that are available for this step and provide instructions for the operator.

Prompt after specimen

Add any text that you want to appear on the screen to prompt the operator.

What type of parameters are available?

Parameters that are related to individual specimens but do not have any effect on test control or calculations are available. When this screen appears as part of the testing sequence, the specimen will have been tested and any results will have been calculated so the list of **Available** parameters is limited. **Specimen Notes** and **Text Inputs** are available. You can also add the option for the operator to exclude the current specimen from the statistics. The **Exclude** option (within the **General** category) is also available in the **Before Calculations** screen.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type.

- **General, Notes** and **Text Inputs** parameters are always available.

- **Dimension** parameters are not available because when this screen appears as part of the testing sequence, the specimen will have been tested and any results will have been calculated.

- **Test** and **Strain** parameters are not available because when this screen appears as part of the testing sequence, the specimen will have been tested.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

To allow an operator to view the value of a parameter, but not change it:

1. Click on a parameter in the **Selected** list.

2. Check **View only**.

The parameter name and value display in the prompted screen, but the operator cannot change the value.

Setup Test Prompts - At Finish

*This screen is available only when you check the **Run as a prompted test** and the **Prompt at finish** boxes in the **Setup Prompted Test Sequence** screen. When you check these boxes, **At Finish** appears in the navigation bar under **Test Prompts**. Click on **At Finish** to display this screen and set up this step in your prompt sequence.*

The **Prompt at finish** is one of the steps available in the prompted test sequence and the **Setup Test Prompts - At Finish** screen lets you set up the parameters that are available for this step and provide instructions for the operator.

Prompt at finish

Add any text that you want to appear on the screen to prompt the operator.

What type of parameters are available?

When this screen appears as part of the testing sequence, all specimens will have been tested and any results will have been calculated. Consequently the list of **Available** parameters is limited to those that are sample-related, that is **Sample Description** and **Sample Notes**. These parameters are also available in the **Before Start** screen, if you prefer to have the operator enter them at the start of testing. They are not available in any other screens because they relate to the entire sample.

How to use the lists

The list of **Available Parameters** is organized in a hierarchy according to the parameter type. **General** is now the only category available.

You can expand and collapse the hierarchy by clicking on the "**+**" and "**-**" signs.

Add a parameter

For each parameter that is to appear as an input on this screen:

1. Click on the parameter in the **Available** list.

2. Click **Add**.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Change the order of parameters

The parameters appear on the workspace screen in the order that they appear in the **Selected** list. To change the order:

1. Click on a parameter in the **Selected** list.

2. Click **Move Up** or **Move Down** to move the item in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Apply view only status

To allow an operator to view the value of a parameter, but not change it:

1. Click on a parameter in the **Selected** list.

2. Check **View only**.

The parameter name and value display in the prompted screen, but the operator cannot change the value.

Save File As dialog box

The **Save File As** dialog box displays when you click the **Save As** button to save a file under a new file name. This may be a test method file, a report template file or a sample.

The file type field in the dialog box is fixed because you cannot change the type of file.

Where do I go from here?

If you are saving a test method file within the **Method** tab or a report template file within the **Report** tab, you return to the screen where you clicked the **Save As** button.

If you are naming a new sample in the **Test** tab, using the **New Sample** option, you move to the test workspace where you can begin testing and adding data to your new sample.

If you are saving a sample from the **Test** tab, you return to the test workspace.

Why didn't it work?

If the file name you have specified already exists, the system prompts you and asks if you want to overwrite the existing file.

Chapter 5
The Test Tab

The **Test** tab contains the test workspace from which an operator can enter test inputs and run tests. The layout of the test workspace varies depending upon whether you are working with freeform tests or prompted tests. This section describes the various components that are available under the **Test** tab and contains the following topics:

Overview of the Test tab

The **Test** tab is where you perform tests and view the resulting test data. The **Test** tab has two layouts: the test workspace and prompt workspace. The test workspace displays one screen that can be customized to display specific components. The prompt workspace overlays the test workspace with a series of screens that guide the user through a series of steps, as defined by the test method, to enter inputs and perform a test.

The **Test** tab displays when you either start a new sample or open an existing sample to continue testing.

The status bar at the bottom of the screen shows the status of the testing system and displays the files that are currently open.

The test workspace display

There is a Specimen Selector on the left side of the screen.

There are two sets of buttons on the right side of the screen: the test control buttons and the file buttons. Use the test control buttons to send commands to the frame, such as start and stop a test. Use the file buttons to finish and save a sample, or print a report.

You can divide the central portion of the screen into multiple panes, containing one or more components. Refer to "Test workspace" on page 5-6 for more information.

The prompt workspace display

When using the prompt sequence to perform a prompted test, the prompt workspace overlays the test workspace. Refer to "Prompt workspace" on page 5-9 for more information.

There are two sets of buttons on the right side of the screen: the test control buttons and the file buttons. Use the test control buttons to send commands to the frame, such as start and stop a test. Depending on where you are in the test sequence, the test control buttons may be disabled. Use the file buttons to finish and save a sample, or print a report.

Create a new sample

The first step to create a sample is to select a test method that contains the settings and parameters for your tests.

1. From the **Home** screen, click **Test**.

2. If necessary, click **New Sample** in the navigation bar.

3. Select a test method. You can either:

    •   browse to select an existing method.

    •   select a method shown on the Most Recently Used list.

Select a test method file

1. Click **Browse…** to open a standard **Open File** dialog box.

2. Find the file and click **Open**.

    When you open the selected method file, the software advances to the next step in which you name the new sample.

If the file does not open, the system displays an open file error message. Refer to the online help for further assistance.

Using the Most Recently Used list

1. Click on the name. The file name and its path appear in the associated fields and a preview of the file displays in the **Preview** window.

2. Click **Next** to open the file.

    The software advances to the next step in which you name the new sample.

Double-click a file name in the list to open it.

Managing the Most Recently Used list

The **Most Recently Used** list displays the most recently used file at the top of the list. To sort the files differently, click on any of the other column headings.

Right-click on a file name in the **Most Recently Used** list to display a context menu with the following items:

Open file	Opens the selected file.
Reset order	Resets the order of files in the list to the default order, with the most recently used at the top.

Remove from MRU list	Removes the selected file from the list.
Clear MRU list	Removes all files from the list.

Return to the Home screen

To return to the home screen, click .

Name the new sample

The second step in creating a new sample is to name the sample and identify where both the sample file and output files are saved.

To name a sample file:

1. In the **Sample filename** field, enter a name for the sample file or accept the name generated by the system.

   The system produces a suggested name for the sample file, based on the most recently used sample file name. If there are no sample files created, the system uses "TestSample" as the default name. The system appends a number to the file name to ensure a unique name.

2. In the **Output folder** field, verify the location to save the output files. To change the location, refer to "Change the output files directory" below.

3. Click **Next** to advance to the **Test** tab.

To return to the previous screen, click **Back**.

Change the output files directory

1. Click **Browse…** on the right side of the screen.

   The **Save Sample File As** dialog displays.

2. Browse to find the directory to save the output files and, if desired, enter a different file name.

3. Click **Save**.

   The system creates the sample file and advances to the **Test** tab.

Return to the Home screen

To return to the home screen, click .

Continue testing a sample

Even after you finish a sample, you can add more specimens to it using the continue testing feature.

1. From the **Home** screen, click **Test**.

2. If necessary, click **Continue Sample** in the navigation bar.

   The **Continue Testing a Sample** screen displays.

3. Select the sample that you want to continue testing. You can either:

   • browse to open a sample.

   • select a sample shown on the Most Recently Used list.

__Merlin Users__ - Continue a Sample combines elements of Resume and Replay in Merlin software.

Continue a Sample lets you see old test data, including individual curves, and print out more copies of the test report - similar to Replay.

Continue a Sample also lets you test more specimens, adding them to the existing sample - similar to Resume.

Open a sample

1. Click **Browse…** to open a standard **Open File** dialog box.

2. Find the file and click **Open**.

   Click **Cancel** to close the dialog box without opening the file.

If the file does not open, the system displays an open file error message. Refer to the online help for further assistance.

When you open the selected sample, the software advances to the test workspace and you can begin testing specimens.

Using the Most Recently Used list

1. Click on the name. The file name and its path appear in the associated fields and a preview of the file displays in the **Preview** window.

2. Click **Open**.

Double-click a file name in the list to open it.

When you open the selected sample, the software advances to the test workspace and you can begin testing specimens.

Managing the Most Recently Used list

The **Most Recently Used** list displays the most recently used file at the top of the list. To sort the files differently, click on any of the other column headings.

Right-click on a file name in the **Most Recently Used** list to display a context menu with the following items:

Open file	Opens the selected file.
Reset order	Resets the order of files in the list to the default order, with the most recently used at the top.
Remove from MRU list	Removes the selected file from the list.
Clear MRU list	Removes all files from the list.

Test workspace

The test workspace displays for freeform tests. For a prompted test, this screen is replaced by the prompt workspace. Refer to "Prompt workspace" on page 5-9 for more information.

You can divide the central portion of the screen into multiple panes, containing one or more screen components. "Context menus" on page 5-7 provides references to more detailed information on each screen component. To change the layout, refer to "Setup workspace layout" on page 4-8.

There are two sets of buttons on the right side of the screen: the test control buttons and the file buttons. Use the test control buttons to send commands to the frame, such as start and stop a test. Use the file buttons to finish and save a sample, or print a report.

When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen. Refer to "Select a specimen" on page 5-11 for more information.

Figure 5-1 shows the test workspace with the following components: Specimen Selector, Graph, Test Inputs and Results.
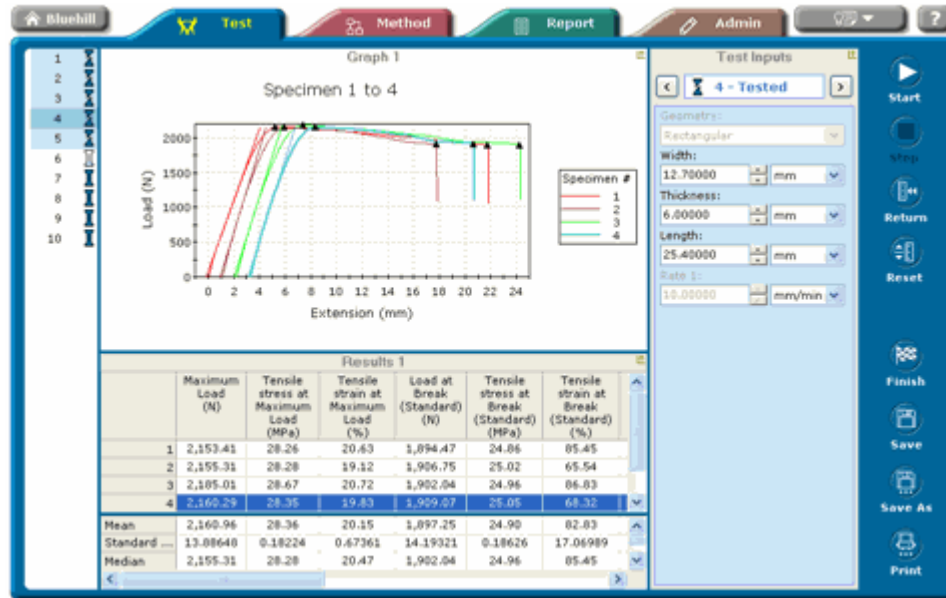
Figure 5-1.   Test Workspace

Context menus

Right-click in the workspace to display a context menu. Some of the items in the context menu are specific to a particular screen component, but most items are common to all screen components. Information for all context menu items can be found in the following topics:

- "Common context menu items" on page 5-11

- "Graph screen component" on page 5-16

- "Results and statistics table screen component" on page 5-19

- "Test inputs screen component" on page 5-20

- "Raw data table screen component" on page 5-21 (available only if you have the optional Reports and Graphs pack).

- "Web camera screen component" on page 5-23 (available only if you have this optional feature)

Test control buttons

These buttons are always available, regardless of the content on the rest of the screen.

Button name	Function
Start Test	Starts the test. Click this button to activate the frame. The test is in progress. [In a prompted test, this button is only available in the Before Test state].
Stop Test	Stops the test and stops collecting data.
Return to Gauge Length	Returns the crosshead or actuator to the gauge length position (i.e. the point where extension equals zero). If you click this button while a test is running, it stops the test and stops collecting data before returning to the gauge length position.
Reset Gauge Length	Resets gauge length to the current position of the crosshead or actuator. [This button is unavailable when a test is running].

File buttons

Button name	Function
Finish Sample	Saves the data for the sample file and finishes the sample. The test method defines how the system finishes the sample. Refer to "Finish a sample" on page 5-28 for more details. If you are using the prompt workspace and your test sequence includes the **At Finish** screen, then this screen displays.
Save Sample	Saves the data for the sample. Does not finish the sample. The workspace still displays and you can continue testing more specimens. In the reanalyze workspace, you can continue reviewing the data, but cannot test additional specimens.
Save Sample **As**	Opens the **Save File As** dialog to save the data to a different name. Does not finish the sample. The workspace still displays and you can continue testing more specimens under the new sample name. In the reanalyze workspace, you can continue reviewing the data, but cannot test additional specimens.
Print Report	Sends the report to a printer. Click **OK** in the **Print** dialog to open a separate window with a preview of the report.

In prompted tests, the system automatically finishes the sample when the designated number of specimens are tested. The test method may also specify that the system automatically print a report.

Prompt workspace

The prompt workspace displays for a prompted test. For a freeform test, this screen is replaced by the test workspace. Refer to "Test workspace" on page 5-6 for more information.

The screen below shows a typical prompt workspace at the **Before Specimen** point in the test sequence. If you set up the test to **Show workspace after test** or **Show workspace before calculations**, then the test workspace displays at those points in the test sequence. This lets you review the graph and results before clicking **Next** to move on to the next point in the test sequence. The test workspace also displays while a test is running.

The test buttons and the file buttons are available in the prompt workspace. Refer to "Test control buttons" on page 5-8 and "File buttons" on page 5-8 for details on these functions.

Figure 5-2.   Prompt Workspace

Select a specimen

You can select a specimen from any one of the screen components as follows:

- In the **Specimen Selector** component, click on a specimen number. The system highlights that specimen number. Right-click on a specimen number to open a context menu with various options available.

- In the **Test Inputs** component, click **>** to move to the next specimen. Click **<** to move to the previous specimen.

- In the **Results Table** component, click on the table row for a specimen number. The system highlights the table row. Right-click on a specimen number to open a context menu. You can only select tested specimens from this component.

- In the **Raw Data Viewer** component, click **>** to move to the next specimen. Click **<** to move to the previous specimen. You can only select tested specimens from this component.

No matter which component you use to select a specimen, all the other components in the workspace synchronize to show the selected specimen, as follows:

- the **Specimen Selector** highlights the specimen number.

- the **Test Inputs** area shows the parameters for that specimen.

- if it has been tested, the **Results Table** highlights the row for the selected specimen. If the selected specimen is not tested, then the table does not change and no row in the table is highlighted.

- if it has been tested, the **Graph** highlights the curve for the selected specimen. If the selected specimen is not tested, then the graph does not change and no curve is highlighted.

- if it has been tested, the **Raw Data Viewer** shows the raw data for the selected specimen. If the selected specimen is not tested, then the raw data component does not change and displays the raw data for the previously selected specimen.

- if it has been tested, the **Web Camera** view loads the video associated with the selected specimen. If the selected specimen is not tested, then there is a live display view.

Common context menu items

Right-click in the workspace to display the context menu. Some of the items in the context menu are specific to a particular screen component, but most items are common to all screen

components. This topic describes the common items. Details for the items in specific context menus can be found in the topics for the individual screen components.

Choose a screen layout

Select **Layout...** to display the **Test View Property Page**. Select one of the basic layouts or click on the **Advanced** tab to customize the workspace.

Refer to "Setup workspace layout" on page 4-8.

Add a specimen

Select **Add Specimen** to add a specimen to the sample. The new specimen appears at the end of the list and becomes the selected specimen. The parameters for that specimen are assigned default values.

If the currently-selected specimen is the last specimen in the sample, the > button in the Test Inputs component changes to a + button. Click + to add a specimen to the sample. This performs the same function as choosing Add Specimen from the context menu.

Delete a specimen

The Delete Specimen item is grayed if a test is in progress, or if security is enabled and you do not have rights to delete specimens.

1. Select the specimen to delete.
2. Right-click in the workspace to display the context menu.
3. Select **Delete Specimen**. This action permanently deletes the specimen and cannot be reversed so you must confirm this action.

When you delete a specimen, all the numbers of the specimens after the deleted one are decremented by one.

Undo the last test

The Undo Test item is grayed if security is enabled and you do not have rights to delete specimens.

This menu item is available for a prompted test in which the test workspace displays after testing or after calculating the results.

It is only available for the last tested specimen in the Post-Test state (as shown by the ⏳ icon).

1. Select the last tested specimen.

2. Right-click in the workspace to display the context menu.

3. Select **Undo Test**. This action permanently deletes the test data and results for that specimen and cannot be reversed.

Undo Test differs from **Delete Specimen** as follows:

- **Undo Test** only deletes test data and calculated results for a specimen. It does not delete any parameters that you entered in earlier prompted test screens, such as dimensions and specimen notes.

- **Delete Specimen** deletes all the information about a specimen, including any parameters that you entered in earlier prompted test screens.

An example of when to use **Undo Test** would be when you enter all the parameters for a specimen and click the **Start Test** button and realize too late that you forgot to install the specimen in the testing machine. This feature lets you remove the test without losing any specimen parameters that you previously entered.

Exclude a specimen (from the statistics)

1. Select the tested specimen to exclude.

2. Right-click in the workspace to display the context menu.

3. Select **Exclude Specimen**.

   The icon for the selected specimen changes to signify that the specimen is excluded. The statistics automatically update. If **Show Excluded Specimens** is disabled, the curve for that specimen disappears from the graph and the results for that specimen disappear from the results table.

Include a specimen (in the statistics)

This menu item lets you change the status of an excluded specimen so that it is once again included in the sample.

1. Select the excluded specimen to include.

2. Right-click in the workspace to display the context menu.

3. Select **Include Specimen**.

The icon for the selected specimen changes to signify that the specimen is now included. The statistics automatically update. If **Show Excluded Specimens** is disabled, the curve for that specimen reappears in the graph and the results for that specimen reappear in the results table.

*If there is more than one specimen excluded, select **Include All** to include all of them in one step.*

Show excluded specimens

The default condition is for **Show Excluded Specimens** to be enabled. To disable this feature, click **Show Excluded Specimens** to remove the checkmark. When you disable this function, the results for excluded specimens disappear from the results table. Curves for excluded specimens disappear from the graph. To re-enable **Show Excluded Specimens**, click the menu item again and the hidden rows containing excluded specimens reappear in the results table and the curves for excluded specimens reappear in the graph.

Edit cursor-selected points

*The **Edit Cursor-Selected Points...** item is unavailable in the following circumstances:*

- *None of the results require cursor-selected points*
- *The currently-selected specimen is untested*
- *The currently-selected specimen is being tested*
- *Security is enabled and you do not have rights to change tested specimens*

1. Right-click in the workspace to display the context menu.

2. If it is available, select **Edit Cursor-Selected Points...**.

   The **Edit Cursor-Selected Points** dialog appears for the currently-selected specimen. Refer to "Edit cursor-selected points" on page 5-26 for details about this dialog.

Enable data point selector

The default condition for the **Data Point Selector** is to be disabled. To enable this feature, click **Enable Data Point Selector**.

Use the Data Point Selector feature to select individual data points of a tested specimen and display:

- the coordinates on the graph. Refer to "Graph screen component" on page 5-16.

- the associated raw data. Refer to "Raw data table screen component" on page 5-21.

- the closest associated video frame. Refer to "Web camera screen component" on page 5-23.

Refer to "Data point selector" on page 5-25 for more detailed information.

Recalculate the results

*The **Recalculate All** item is unavailable if a test is in progress.*

If you change a value of a parameter for a tested specimen, or add a result to the table, or change any calculation parameters, you must recalculate the results to update all the values and graph markers.

1. Right-click in the workspace to display the context menu.

2. Select **Recalculate All**.

    The system recalculates all the results and statistics values in the results table and updates any graph markers.

Specimen selector screen component

This is one of the components of the workspace. It always appears and is independent of the layout setting. Each specimen in the sample is represented by an icon in this component and the icon changes to indicate the status of the specimen (untested, tested, excluded).

The **Specimen Selector** component links to the other components in the workspace as described in "Select a specimen" on page 5-11. When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen.

Specimen status indicators

The **Specimen Selector** shows the status of specimens as follows:

Icon	Specimen State
	Untested
	Untested (Next specimen to be tested)
	Testing (Being tested now - a test is running)
	Post-Test (Tested but system is processing data or waiting for more input; final dimensions, for example, or cursor-selected points on the graph)
	Tested
	In the Tested state, but Excluded from statistics

If the list of specimens is too long for the screen space, a scroll bar appears to scroll up and down the list. Use the **Up Arrow** and **Down Arrow** keys to move between specimens one at a time or the **Page Up** and **Page Down** keys to move up and down the list in blocks.

Context menu items

Right-click in the workspace to display a context menu. Only the common items appear in the **Specimen Selector** screen component. Refer to "Common context menu items" on page 5-11 for more details.

Graph screen component

This is a component of the workspace. The runtime graph appears in the appropriate location within the workspace, as defined by the screen layout.

Define the workspace layout from either the **Method** tab or the workspace. From the **Method** tab, select **General > Basic Layout** or **Advanced Layout** on the navigation bar. From the workspace, right-click on the workspace to display the context menu and choose **Layout...**. Refer to "Setup workspace layout" on page 4-8 for more details.

The standard layouts include one **Graph**. To set up two graphs, use one of the dual graph enhanced layouts or use an advanced layout and assign one screen area to each graph.

The **Graph** component links to the other components in the workspace as described in "Select a specimen" on page 5-11. When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen.

Working with the graph

Zooming and scaling

Click and drag over an area on the graph to zoom in on that area. The graph redraws to show only the selected area. The axes are changed to manual scaling with values defined by the selected area. Use **Unzoom** in the context menu to reverse through a number of zooming operations.

Graph properties

Double-click on one of the following items in the **Graph** area to display the **Properties** dialog:

Item	Location in Properties dialog
Graph title	**Type** tab, Graph title highlighted.
X-axis	**X-data** tab, X-axis channel highlighted.
X-axis title	**Advanced** tab, X-axis title highlighted.
Y-axis	**Y-data** tab, Y-axis channel highlighted.
Y-axis title	**Advanced** tab, Y-axis title highlighted.
Legend	**Advanced** tab, Legend settings selected.

Context menu items

Right-click in the workspace to display a context menu. Some of the items in the context menu are specific to a particular screen component, but most items are common to all components and they are described in "Common context menu items" on page 5-11.

The following table describes those menu items that are specific to the Graph component.

Menu Item	Function
Autoscale	Click this item to set both axes to automatic scaling and undo all of the zoom operations that you have performed.
Unzoom	This item is grayed if you have not performed any previous zoom operation or if you have visited the **Properties** dialog for the graph.
	If you click on **Unzoom**, the system restores the previous set of manual scaling values. By clicking **Unzoom** repeatedly, you can back track through a number of zoom operations that you have performed.
Show Grid	The default condition is for **Show Grid** to be enabled, indicated by a checkmark in front of it. If you click on **Show Grid**, the checkmark disappears and the grid lines disappear. To re-enable **Show Grid**, click the menu item again. The checkmark and the grid lines reappear.
Show Legend	The default condition is for **Show Legend** to be enabled, indicated by a checkmark in front of it in the menu. If you click on **Show Legend**, the checkmark disappears and the legend disappears. To re-enable **Show Legend**, click the menu item again. The checkmark and the legend reappear.
Print Graph...	Select **Print Graph...** to open a standard **Print** dialog box from which you can print the graph.
Copy Graph	Select **Copy Graph** to copy the graph to the clipboard so you can use the standard Paste command to paste it into any other software application.
Properties...	Select **Properties...** to open the **Properties** dialog box. The tabs in this dialog contain the same controls as the screens of the same name in the **Graph** area within the **Method** tab.
	Refer to the following topics for more information:
	• "Setup Graph Type" on page 4-50
	• "Setup Graph X-data" on page 4-52
	• "Setup Graph Y-data" on page 4-53
	• "Setup Advanced Graph Styles" on page 4-55

Using the data point selector

If this control is enabled, then use the data point selector to highlight an individual data point on a curve. To enable this control from the workspace, right-click on the workspace to display the context menu and choose **Enable Data Point Selector**.

When the cursor moves over the graph area, the cursor changes from an arrow to crosshairs as it approaches a data point on a curve. The coordinates of the data point display in a tooltip. Click to select the data point.

When you select a data point, the system highlights the corresponding row in the **Raw Data Table** screen component (if available), and displays the closest corresponding video frame in the **Web Camera** component (if available).

To fine-tune your selection, use the arrow keys to move up and down from the currently-selected point. The up and down arrow keys move in increments of 10% of the data points. The left and right arrow keys move one data point at a time.

Results and statistics table screen component

This is one of the components of the workspace. The table appears in the appropriate location within the workspace, as defined by the screen layout.

Define the workspace layout from either the **Method** tab or the workspace. From the **Method** tab, select **General > Basic Layout** or **Advanced Layout** on the navigation bar. From the workspace, right-click on the workspace to display the context menu and choose **Layout...**. Refer to "Setup workspace layout" on page 4-8 for more details.

The basic layouts include one **Results and Statistics** table. To set up two tables, use an advanced layout and assign one screen area to each table.

The **Results and Statistics** table links to the other components in the workspace as described in "Select a specimen" on page 5-11. When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen.

Context menu items

Right-click in the workspace to display a context menu. Some of the items in the context menu are specific to a particular screen component, but most items are common to all components and they are described in "Common context menu items" on page 5-11.

The following table describes those menu items that are specific to the Results Table component.

Menu Item	Function
Auto Size Column Widths	Select this item to set the column widths so that the heading text fits on one line. The units are on the second line. If the text cannot fit on one line and the column width is at its maximum, the text wraps. **Auto Size** also examines the number of decimal places for each result and sets the column widths accordingly. If you size the columns manually by dragging the column divider, the heading text wraps automatically.
Reset Columns to Default Width	Select this item to reset all the columns to the original default width.
Column Properties...	Right-click in a column in the **Results and Statistics** table and select **Column Properties...** from the context menu. (If you right-click outside a column, this item is grayed). The **Properties** dialog displays for the result in that column. The attributes are the same attributes that are set in the **Setup Results Table Columns** screen within the **Method** tab. Refer to "Setup Results Table Columns" on page 4-43. If Security is enabled, only managers and administrators have access to the **Method** tab and this menu item.
View Results and Statistics View Results only View Statistics only	Select the appropriate menu item. A checkmark indicates the current choice.
Copy Table	Select **Copy Table** to copy the table to the clipboard. It becomes available to paste into any other software application. The view settings and show excluded specimens settings are maintained in the copied table.
Print Table...	Select **Print Table...** to print the table. The view settings and show excluded specimens settings are maintained in the printed table.

Test inputs screen component

This is one of the components of the workspace. It appears in the appropriate location within the workspace, as defined by the screen layout.

Define the workspace layout from either the **Method** tab or the workspace. From the **Method** tab, select **General > Basic Layout** or **Advanced Layout** on the navigation bar. From the workspace, right-click on the workspace to display the context menu and choose **Layout...**. Refer to "Setup workspace layout" on page 4-8 for more details.

The **Test Inputs** component links to the other components in the workspace as described in "Select a specimen" on page 5-11. When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen.

Use this component to enter parameter values for individual specimens. The fields that appear in this area are chosen in the **Setup Test Prompts - Test Workspace** screen of the **Method** tab. When you first create the sample, the values for each specimen are set to the default values from the test method. You can move between specimens and enter values for any specimen before it is tested, while it is being tested, or after it has been tested. The most common parameters for this screen are specimen dimensions.

Use this feature when tests take a long time to run. Start testing the first specimen and, while that test is running, enter specimen dimensions for all the remaining specimens.

Context menu items

Right-click in the workspace to display a context menu. Only the common items appear in the **Test Inputs** screen component. Refer to "Common context menu items" on page 5-11 for more details.

Restrictions on inputs

There are restrictions on entering parameter values in the **Test Inputs** screen:

- Dimensions cannot be entered while a specimen is being tested.

- Control parameters cannot be changed after a specimen is tested.

- If security is enabled, and depending upon your rights within that, you may be prevented from changing any values on tested specimens.

Raw data table screen component

This feature is available only if you have the optional Reports and Graphs Pack.

This is one of the components of the workspace. The table appears in the appropriate location within the workspace, as defined by the screen layout.

Define the workspace layout from either the **Method** tab or the workspace. From the **Method** tab, select **General > Basic Layout** or **Advanced Layout** on the navigation bar. From the workspace, right-click on the workspace to display the context menu and choose **Layout...**. Refer to "Setup workspace layout" on page 4-8 for more details.

The **Raw Data** table links to the other components in the workspace as described in "Select a specimen" on page 5-11. When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen.

Context menu items

Right-click in the workspace to display a context menu. Some of the items in the context menu are specific to a particular screen component, but most items are common to all components and they are described in "Common context menu items" on page 5-11.

The following table describes those menu items that are specific to the Raw Data Table component.

Menu Item	Function
Auto Size Column Widths	Select this item to set the column widths so that the heading text fits on one line. The units are on the second line. If the text cannot fit on one line and the column width is at its maximum, the text wraps. **Auto Size** also examines the number of decimal places for each channel and sets the column widths accordingly. If you size the columns manually by dragging the column divider, the heading text wraps automatically.
Reset Columns to Default Width	Select this item to reset all the columns to the original default width.
Column Properties...	Right-click in a column in the **Raw Data** table and select **Column Properties...** from the context menu. (If you right-click outside a column, this item is grayed). The **Properties** dialog displays for the channel in that column. The attributes are the same attributes that you set in the **Setup Raw Data Table Columns** screen within the **Method** tab. Refer to "Setup Raw Data Table Columns" on page 4-57.
	If Security is enabled, only managers and administrators have access to the **Method** tab and this menu item.
Copy Table	Select **Copy Table** to copy the table to the clipboard. It becomes available to paste into any other software application. The view settings and show excluded specimens settings are maintained in the copied table.
Copy Selected Cells	Click and drag the cursor over the cells, open the context menu and select **Copy Selected Cells**. The selected cells are copied to the clipboard and are available to paste into any other software application.

Using the data point selector

If this control is enabled, then use the data point selector to highlight an individual data point on a curve. To enable this control from the workspace, right-click on the workspace to display the context menu and choose **Enable Data Point Selector**.

When you select a data point in the raw data table, the system highlights the corresponding data point on the specimen's curve, shown in the **Graph** component, and displays the closest corresponding video frame in the **Web Camera** component (if available).

Web camera screen component

The web camera is only available if you have the optional Web Camera feature.

This is one of the components of the workspace. The web camera view appears in the appropriate location within the workspace, as defined by the screen layout.

Define the workspace layout from either the **Method** tab or the workspace. From the **Method** tab, select **General > Basic Layout** or **Advanced Layout** on the navigation bar. From the workspace, right-click on the workspace to display the context menu and choose **Layout...**. Refer to "Setup workspace layout" on page 4-8 for more details.

The **Web Camera** component links to the other components in the workspace as described in "Select a specimen" on page 5-11. When you highlight a specimen in any one component, all the other components synchronize to show the selected specimen.

In order for a web camera to work with Bluehill®, you must configure the web camera in Bluehill® and enable the recording function so that the system records video as it records the specimen data. When using a web camera, the system performs a series of checks before starting a test:

- Is the web camera recording feature enabled?

- Is a camera connected to the system and can the system communicate with it?

- Can the camera perform at the specified frame interval rate?

If any of the above checks fail, then a message displays indicating the error. If the recording feature is enabled, you cannot start a test until you correct the error. If the recording feature is disabled, you can start a test but with no video recording.

Display

The display in the **Web Camera** component differs depending on different scenarios. The following table summarizes the web camera status:

Scenario	Web Camera Display
The selected specimen is untested.	Displays a live view with no media player controls.
Test in progress on a specimen.	Displays a live stream of the video recording. The system starts recording when data capture begins. If you enabled Capture Precycle Data, then the precycling segment of the test is recorded.
Test ends.	Recording stops and the display reverts back to a live view when the system advances to the next untested specimen.
Select a tested specimen with Data Point Selector disabled.	The system loads the video for the specimen and displays the media player controls so you can interact with the video.
Select a tested specimen with Data Point Selector enabled.	The system loads the video for the specimen and displays the video frame that is closest to the selected data point. The media player controls display so you can interact with the video.
The selected specimen is excluded and the Show Excluded Specimens is enabled.	Nothing displays.
No camera is connected to the system computer.	Nothing displays.
Video file is missing.	Nothing displays and an error message appears. Refer to "Test data files" on page 7-11 for information on how the system saves video files.

Context menu items

Right-click in the workspace to display a context menu. Some of the items in the context menu are specific to a particular screen component, but most items are common to all components and they are described in "Common context menu items" on page 5-11.

The context menu also has a **Properties** option that opens the Properties dialog associated with the software for the web camera. This dialog is not associated with the Bluehill® software.

Using the data point selector

If you enabled this control in the **Setup Graph Type** screen in the **Method** tab, or in the context menu in the workspace, you can use the data point selector to track the data points while viewing the video. When you play the video for a tested specimen, the specimen's curve displays in the **Graph** component and highlights the data point on the curve that is closest to each video frame. Likewise, the **Raw Data** table highlights the data for the closest data point.

When you pause the video, the closest data point to the selected video frame remains highlighted in the **Graph** component and in the **Raw Data** table.

Data point selector

The Data Point Selector feature finds individual data points of a tested specimen. You can select a specific data point from any one of the three screen components: Graph, Raw Data Viewer and Web Camera.

Raw Data Viewer and Web Camera are optional features. The Raw Data Viewer is only available if you have the Reports and Graphs Pack. The web camera is only available if you have the optional Web Camera feature.

The default condition for the **Data Point Selector** is to be disabled. Enable this feature from either the **Method** tab or from the workspace:

- From the **Method** tab, select **Graph > Type** on the navigation bar and check **Enable data point selector**. When this change is made from the **Method** tab, it can be saved as part of the test method for future use.

- From the workspace, right-click in the workspace to display the context menu and check **Enable data point selector**. When this change is made from the workspace, it is only available for the currently opened sample. It does not change the test method.

When Data Point Selector is enabled, select any data point on a tested specimen and all three screen components coordinate to display as follows:

- The Graph screen highlights the data point on the specimen's curve.

- The Raw Data Viewer displays the data for that specimen with the selected data point highlighted.

- The Web Camera displays the closest video frame associated with the selected data point.

The system remembers previously selected data points in the sample. This information is stored only while the sample is open. After closing the sample, even if it is saved, the system does not remember the selected data points. The next time you open the sample, the data point selector is enabled but any previously selected data points must be selected again.

Edit cursor-selected points

This feature lets you select a point on the graph to use as an input to a calculation. For example, to graphically select a point to define specimen break, include Break (Cursor) in the test method calculations. After each test finishes, a dialog box opens to view the graph and mark the data point that the software uses in the break calculation.

For some calculations, it may be necessary to select Cursor as the channel.

Open the dialog

If a calculation in the results table requires a cursor-selected point, the **Edit Cursor-Selected Points** dialog opens automatically after a specimen is tested.

*To change one of these data points, select the specimen and then right-click on the specimen to select **Edit Cursor-Selected Points...** from the context menu. The dialog opens to select a different point.*

*If the currently-selected specimen is untested, the **Edit Cursor-Selected Points...** menu item is unavailable.*

Select a data point

The specimen number and the calculation name display at the top of the dialog, with additional text indicating the required data points. The graph for the specimen displays with a data point selector slider control below it.

1. Click on the curve to select a point. The software selects the data point closest to the position and places a marker on the graph. The x- and y-coordinates of the selected data point display above the graph and the slider control moves to the position of the selected point relative to the entire data set.

Double-click on a data point in the graph to select it. If the points are too close together, use the zoom feature. Refer to "Working with the graph".

2. To fine-tune the selection, use the arrow keys to move up and down within the data set from the currently-selected point.

The up and down arrow keys move in increments of 10% of the data points. The left and right arrow keys move in increments of 1% of the data points. When you press one of these keys, the system updates the slider control, the marker on the graph, and the coordinates of the data point. You can also use the slider control to move between points in the data set.

3. Click **Next** to move on to the next required cursor point (if necessary).

    Click **Previous** to move back to the previous cursor point.

    The **Clear** button removes the current cursor point.

4. When the required points are selected, click **Finish** to update the results with the new cursor point values and close the **Edit Cursor-Selected Points** dialog.

Click **Finish** to close the dialog at any time. If there are any missing cursor points, the system does not calculate those results and they do not appear in the results table.

Working with the graph

Some of the Graph screen component features are also available in the **Edit Cursor-Selected Points** dialog:

- Click and drag to zoom the graph.

- Right-click in the graph to display the context menu:

    Autoscale

    Unzoom

    Copy Graph

    Properties... (consists only of the X-data and Y-data tabs)

For details on these functions, refer to "Graph screen component" on page 5-16.

Calculations that use cursor-selected points

The calculations that require selected points on the graph are shown below.

Base Library	Break (Cursor)
	Preset Point
General Library	Slack Correction (Youngs)
	Slack Correction (Channel Value)
	Young's Modulus
	Chord Modulus
	Segment Modulus
	Secant Modulus
	Tangent Modulus
	Poisson's Ratio (Chord)
	Poisson's Ratio (Least Squares Fit)
	Young's Slope
	Chord Slope
	Segment Slope
	Secant Slope
	Tangent Slope
Creep/Relaxation Library	Hold Preset Point
Metals Library	Yield Point Extension (Cursor)
	n-Value (Manual)
	n-Value (Manual - Automatic Validation)
Peel, Tear and Friction Library	First Peak
	Average Value

Refer to the Calculations Reference manual for more detailed information on these calculations.

Finish a sample

A sample is a collection of specimens. You finish a sample when all the specimens are tested and you want to generate the output that is specified in the test method. This output is defined in the **Reports** section within the **Method** tab. Refer to "Reports menu items" on page 4-61.

Finish a sample in a freeform test

The test workspace displays for a freeform test. To finish a sample:

1. Click **Finish**.

   The system saves the sample, generates the output files indicated in the test method, saves the output files to the specified directory, and closes the sample.

   A dialog appears asking to start a new sample. This dialog provides a shortcut to start a new sample using the same test parameters from the previous sample rather than specifying a test method file again.

2. Click **Yes** to retain the test parameters and open a new sample. The system advances directly to the second step in the **Create a New Sample** process to name the sample.

   Click **No** to clear the test parameters from memory. If any changes were made to the test parameters in the **Method** tab, the system prompts you to save them to the test method file. The system then moves to the first step in the **Create a New Sample** process to select a test method.

Finish a sample in a prompted test

The prompt workspace displays for a prompted test. In a prompted test, the test method specifies the number of specimens in the sample. When that number of specimens is tested, a message appears prompting you to finish the sample. The message contains a **Finish** button that behaves the same way as the **Finish** button in the freeform test. To continue testing, click **Continue Testing**.

*If you select **Continue Testing**, you are not prompted again to finish the sample. Click the **Finish** button when testing is done.*

Save changes to test method dialog

*The system saves all your changes with the sample when you click **Finish**. Your changes will always be included with the sample. If you use the Continue Sample feature to restart testing on the sample, your changes will be there.*

This dialog appears when changes were made to the test parameters from the **Method** tab and you finish the sample before saving the test method file. This dialog asks if you want to save the changes to the test method file:

- Click **No** to close the method file without saving the changes. The test method maintains the original test parameters.

- Click **Yes** to save the changes. A **Save As** dialog appears to save the test method with a new file name or with its original file name.

Start another new sample dialog

This dialog appears after finishing a sample. It provides a shortcut to start a new sample using the same test parameters from the previous sample rather than specifying a test method file again.

What happens if I click No?

The system clears the test parameters out of memory. To start a new sample now, you must choose a test method file to load the test parameters.

What happens if I click Yes?

The system retains the test parameters in memory. The system starts a new sample and advances to the second step in the new sample process to name the new sample.

I didn't want to finish the sample, what can I do?

At this point, the sample is closed but the system saved all the information. To continue testing in the sample:

1. Click **No** in this dialog.

*If the **Save Changes to Test Method** dialog opens, select Yes or No to save the changes to the test method. Refer to "Save changes to test method dialog" on page 5-29.*

The system opens the **Continue Testing a Sample** screen.

2. Double-click on the sample name at the top of the **Most Recently Used** list to open the sample. You can now resume testing.

Chapter 6
The Report Tab

The **Report** tab is where you design report templates. This section includes the following topics:

Overview of the Report tab

> *The **Report** tab is only available if you purchased the optional Reports and Graphs Pack. If you do not have this option, then choose one of the standard report templates from the **Method** tab. Note that you cannot modify it. Refer to "Setup Document Outputs" on page 4-61.*
>
> *If security is enabled, only managers and administrators have access to the **Report** tab. Refer to "Security reference" on page 7-2 for more details.*

The **Report** tab is where you design report templates to include necessary information in a customized format. This tab displays when you:

- open a report template to create or modify it. Refer to "Open a report template file" on page 6-5.

- open a method file or create a new method. Click the **Report** tab to edit the report template file that is linked to the method file.

- open a sample or create a new sample. Click the **Report** tab to edit the report template file that is linked to the method file for the sample.
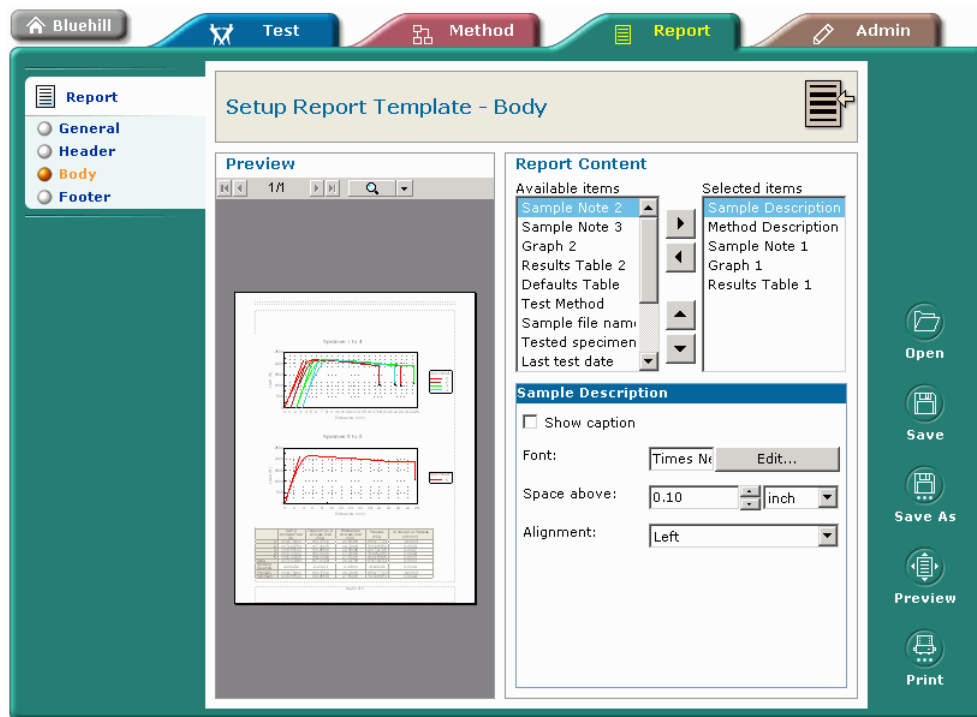
Figure 6-1.   Report Tab

Navigate within the Report tab

Click on an item in the navigation bar on the left side of the screen to display the appropriate contents for that selection.

The button that you select on the **Home** screen determines what tabs are available to you. Refer to "Navigate between tabs" on page 1-7 to see which tabs are available.

The status bar at the bottom of the screen shows the status of the testing system and displays the files that are currently open.

Buttons available in the Report tab

Open	[Only available when there is a test method open]. Opens a different report template file from the one currently linked to the open method. If you changed the settings, you are prompted to save the file. After responding to the prompt, the **Open Report Template** screen displays. When you open a new report template, the link from the **Method** tab updates to use the new template. See "Select a report template" on page 4-62.
Save & Close	[Not available when there is a test method open]. Saves the current report template and you can open another one. This action overwrites the original report template and you return to the **Open Report Template** screen where you can open another report template.
Save	Saves all the current settings to the file that you opened or that was linked to the current test method. This action overwrites the original report template. If you create a new report template, this button behaves as a **Save As** button.
Save As	Saves the current settings to a new file name.
Preview	Opens a full page view of the report. If you have a sample open with test data available, the preview includes the test data.
Print	Prints the report. If there is a test method open, the report uses the parameters from the test method. If there is a sample open, and test data is available, the report uses the data. If neither a sample or a test method is open, the report contains placeholders for elements in the template and some tables may contain blank cells.

Edit a report template

Select each item in the navigation bar to modify the associated parameters. The **Report** screens are described in the following sections:

- "Setup Report Template - General" on page 6-7
- "Setup Report Template - Header" on page 6-7
- "Setup Report Template - Body" on page 6-8
- "Setup Report Template - Footer" on page 6-13

Standard report templates

The standard report templates included with the software are:

Name	Content and Format
Report - All Items (Default Report Template)	Sample Description and Method Description Defaults Table Sample notes 1 through 3 Graph 1 (Best Fit unchecked, width 100%, height 35%)) Results Table 1 (Best Fit unchecked, Results Table produced at the same size as it is displayed on the screen and wraps if necessary).
Report - All Items - Landscape	Same content as Report - All Items, but in landscape format
Report - All Items - Results Best Fit	Same content as Report - All Items, but the Results Table is set to Best Fit. This means that the Results Table is reduced in size so that it fits across the page; it does not wrap.
Report - All Items - Separate Graph	Same content as Report - All Items, but with the Graph placed last in the list and with Best Fit checked.
Report - All Items - less Sample Notes	Same content as Report - All Items, but without the Sample Notes.
Report - All Items - less Sample Notes & Best Fit Results	Same content as Report - All Items, but without the Sample Notes. Also the Results Table is set to Best Fit. This means that the Results Table is reduced in size so that it fits across the page; it does not wrap.
Report - Reduced - Header, Defaults Table, Results	Contains only: Sample Description Defaults Table Results Table 1
Report - Reduced - Header, Defaults Table, Graph, Results	Contains only: Sample Description Defaults Table Graph Results Table 1

How report templates work

Report template files are linked to test method files. The test method stores a link to a report template, which the software opens at the same time as the test method file.

If you open a report template in the **Report** tab when a method file is open, that template becomes linked to the test method file. Alternatively, from the **Method** tab, you can change the report template link in the **Setup Document Outputs** screen and this opens the appropriate report template file in the **Report** tab. Save the test method to save the new link.

Open a report template file

From the **Home** screen, click **Report**.

The screen consists of a **Most Recently Used** list, a **Preview** area and three buttons (**Open**, **Browse...** and **New...**) on the right side of the screen. You can either:

- create a new report.

- browse to open an existing report.

- select a report shown on the Most Recently Used list.

Create a new file

To create a new report template, click **New...**. The system creates a new, blank report template to edit.

Open an existing file

1. Click **Browse…** to open an **Open File** dialog box.

2. Find the file and click **Open**.

   The system opens the file and advances to the appropriate tab in the software.

   Click **Cancel** to close the dialog box.

If the file does not open, the system displays an open file error message. Refer to the online help for further assistance.

Using the Most Recently Used list

1. Click on the name. The file name and its path appear in the associated fields and a preview of the file displays in the **Preview** window.

2. Click **Open** to open the file and advance to the appropriate tab in the software.

Double-click a file name in the list to open it.

Managing the Most Recently Used list

The **Most Recently Used** list displays the most recently used file at the top of the list. To sort the files differently, click any of the other column headings.

Right-click on a file name in the **Most Recently Used** list to display a context menu with the following items:

Open file	Opens the selected file.
Reset order	Resets the order of files in the list to the default order, with the most recently used at the top.
Remove from MRU list	Removes the selected file from the list.
Clear MRU list	Removes all files from the list.

First time use

To open an Instron® standard report template, click **Browse...** to find the default location for the Templates folder. Use one of the standard templates as a starting point to create your own report format and save it with a new name.

Operating System	Default Location for Templates Folder
Windows XP	`C:\Documents and Settings\All Users\` `Shared Documents\Instron\Bluehill\Templates`
Windows Vista	`C:\Users\Public\Documents\Instron\` `Bluehill\Templates`
Windows 7	`C:\Users\Public\Documents\Instron\` `Bluehill\Templates`

Return to the Home screen

To return to the home screen, click ⌂ Bluehill .

Setup Report Template - General

This screen sets up the basic framework for the report template, including page orientation and page margins. To find this screen, open the **Report** tab and click **Report > General** in the navigation bar.

*Set the paper size for the report in the **Print Setup** dialog that displays for the **Print** button.*

Page settings

Enter a description of the report template in the **Description** field. This appears in the preview of the report template in the **Open a Report Template** screen. It does not appear in the report.

Select portrait or landscape format for the page orientation. The page orientation setting overrides the printer setting.

Set a default font for the report. The software uses this font throughout the report, except for those report elements that have their own font control.

Preview

The preview area displays the changes made to the template. If a sample is open and test data is available, the preview shows real data. If there is no data available, the preview displays a placeholder representing each element of the report.

To see a full page view of the report, click **Preview** on the bottom right of the screen. To return to the underlying screen, close the preview window.

Setup Report Template - Header

This screen sets up the content of the header, which appears at the top of each page. To find this screen, open the **Report** tab and click **Report > Header** in the navigation bar.

*Set the paper size for the report in the **Print Setup** dialog that displays for the **Print** button.*

Header settings

This area contains choices for items to appear on the left, in the center, and on the right of the header.

Text items

Text items include pre-formatted selections such as page number, user name, and the date and time of the last test. To enter customized text, select **User defined text** and enter text in the **Text** field.

Picture and Company Logo

The **Picture** item is available only if you have the Reports and Graphs Pack. Use this item to include a company logo or other picture. Click **Browse...** to find and select the picture you want to display.

Use the **Company logo** item to display the graphic identified on the **System Preferences** screen under the **Admin** tab. This enables users without the Reports and Graphs Pack to include a company logo on reports.

Preview

The preview area displays the changes made to the template. If a sample is open and test data is available, the preview shows real data. If there is no data available, the preview displays a placeholder representing each element of the report.

To see a full page view of the report, click **Preview** on the bottom right of the screen. To return to the underlying screen, close the preview window.

Setup Report Template - Body

This screen sets up the content of a report. To find this screen, open the **Report** tab and click **Report > Body** in the navigation bar.

The screen is divided into three areas; a preview area, a selection area, and an area to edit the settings for each of the selected items.

*Set the paper size for the report in the **Print Setup** dialog that displays for the **Print** button.*

Report content

The list of available items contains all the items for a report template.

To add an item to the **Selected** list, select it in the **Available** list and click **Add**.

The items appear in the report template in the same order that they appear in the **Selected** list. To change the order, highlight an item in the **Selected** list and click **Move up** or **Move down** to change its position in the list.

*Alternatively, click and drag parameters between the **Available** and **Selected** lists, or to change the order in the **Selected** list.*

*Double-click on a parameter in the **Available** list to add it to the **Selected** list.*

Click on an item in the **Selected** list to display its associated properties below the list. The following sections list the items and their properties.

Sample parameters and method description

These items include the method description, sample description and any of the three sample notes. Set up these parameters in the **Method** tab by selecting **General > Method** and **General >Sample** in the navigation bar.

The **Show caption** is checked by default and the caption appears above the parameter text in the report.

*If you changed any of these parameter names in the **Method** tab, then the new name appears in the **Available** list. For example, if you changed **Method Description** to **Procedure Description** in the test method, then **Procedure Description** appears.*

The properties for these items are:

Property	Description
Font	The font is the default font setting in the **Setup Report Template - General** screen. Click **Edit...** to change the font.

Property	Description
Space above	Set the space between this item and the item above it in the report.
Alignment	Choose Left, Center or Right alignment.

Graph 1, Graph 2, Results Table 1 and Results Table 2

The formatting for these items is taken from the settings in the **Method** tab for Graph format and Results table format.

The properties for these items are:

Property	Description
Caption	Enter text for a caption above the graph or results table. The font is the default font setting in the **Setup Report Template - General** screen.
Space above	Set the space between this item and the item above it in the report.
Best Fit	The default choice is **Best-fit**. This takes the item and sizes it to fit within the margins of the page.
	If you uncheck **Best-fit** for a graph, two fields display to set the width and height of the graph manually.
	If you uncheck **Best-fit** for a results table, the results table displays in its original size. If the columns do not fit within the page width, the table wraps so that all columns are visible. If all the table rows do not fit on one page, the table splits and the column headings repeat on each page.

Tested Specimens, Last test date, Sample File Name, Sample Author

Sample author is the person that last saved the sample. Refer to "Author and user parameters" on page 7-4 for more information.

Tested specimens is the number of specimens actually tested in the sample. This is different from the parameter **Number of specimens in sample**, which is defined in a prompted test to trigger the prompt for the operator to finish the sample.

Enter text in the **Caption** field to have a caption next to the parameter value. The default caption is the name of the parameter followed by a colon. For example, the default for **Tested Specimens** where the value is 5 is:

```
Tested specimens: 5
```

To change the caption so that the value is embedded in a sentence, use the %value% format. For example, type the following in the caption:

The sample contains %value% specimens.

The software inserts the correct number in place of the %value% text.

The properties for these items are:

Property	Description
Font	The font is the default font setting in the **Setup Report Template - General** screen. Click **Edit...** to change the font.
Space above	Set the space between this item and the item above it in the report.
Alignment	Choose Left, Center or Right alignment.

Defaults Table

Set up the content of the Defaults Table in the **Method** tab. Refer to .

The properties for this item are:

Property	Description
Caption	Enter text for a caption to appear above this item.
Font	The font is the default font setting in the **Setup Report Template - General** screen. Click **Edit...** to change the font.
Space above	Set the space between this item and the item above it in the report.

Text and Note

Use **Text** to add a short comment to the report such as adding a company name or including a standard statement. Use **Note** to add a longer comment to the report. Use these items only for text that remains the same for all samples.

Enter text in the **User defined text** field.

The properties for these items are:

Property	Description
Font	The font is the default font setting in the **Setup Report Template - General** screen. Click **Edit...** to change the font.
Space above	Set the space between this item and the item above it in the report.
Alignment	Choose Left, Center or Right alignment.

Picture

Use this item to add a company logo to the report.

The properties for this item are:

Property	Description
Caption	Enter text for a caption to appear above this item. The font is the default font setting in the **Setup Report Template - General** screen.
Space above	Set the space between this item and the item above it in the report.
Size	The default choice is **Original**. The picture displays at its original size. Choose **Best fit** to fit the picture within the defined margins of the page. Choose **Manual** to manually set the width and height of the picture. To maintain the same aspect ratio as the original picture, check **Maintain aspect ratio**.
Alignment	Choose Left, Center or Right alignment.
Picture file	Identify the picture you want to display. Click **Browse...** to search for it.

Test Method

This item includes every test method parameter in the report. The content is the same as printing the test method from the **Method** tab.

The properties for this item are:

Property	Description
Caption	Enter text for a caption to appear above this item.
Font	The font is the default font setting in the **Setup Report Template - General** screen. Click **Edit...** to change the font.
Space above	Set the space between this item and the item above it in the report.

Preview

The preview area displays the changes made to the template. If a sample is open and test data is available, the preview shows real data. If there is no data available, the preview displays a placeholder representing each element of the report.

To see a full page view of the report, click **Preview** on the bottom right of the screen. To return to the underlying screen, close the preview window.

Setup Report Template - Footer

This screen sets up the content of the footer, which appears at the bottom of each page. To find this screen, open the **Report** tab and click **Report > Footer** in the navigation bar.

*Set the paper size for the report in the **Print Setup** dialog that displays for the **Print** button.*

Footer settings

This area contains choices for items to appear on the left, in the center, and on the right of the footer.

Text items

Text items include pre-formatted selections such as page number, user name, and the date and time of the last test. To enter customized text, select **User defined text** and enter text in the **Text** field.

Picture and Company Logo

The **Picture** item is available only if you have the Reports and Graphs Pack. Use this item to include a company logo or other picture. Click **Browse...** to find and select the picture you want to display.

Use the **Company logo** item to display the graphic identified on the **System Preferences** screen under the **Admin** tab. This enables users without the Reports and Graphs Pack to include a company logo on reports.

Preview

The preview area displays the changes made to the template. If a sample is open and test data is available, the preview shows real data. If there is no data available, the preview displays a placeholder representing each element of the report.

To see a full page view of the report, click **Preview** on the bottom right of the screen. To return to the underlying screen, close the preview window.

Chapter 7
Reference

This section provides greater detail about certain aspects of the software that enables you to better utilize the features of the software. This section contains the following topics:

Security reference

Security levels

The following table shows the three levels of security and the accessibility for each level:

	Administrator	Manager	Operator
Test tab	Yes	Yes	Yes
Method tab	Yes	Yes	No
Report tab	Yes	Yes	No
Admin tab	Yes	Limited access including: View information My Security Settings System Preferences	Limited access including: View information My Security Settings System Preferences
Reanalyze tab	Yes	Yes	Yes

*The **Report** tab is only available if you purchased the optional Reports and Graphs Pack.*

Administrator

An administrator has complete access to all screens in the software. From the **Admin** tab, only an administrator can manage the security user profiles, set the export file settings, email preferences, and configure components of the system.

Manager

A manager can do everything that an administrator can do in the **Test, Method, Reanalyze** and **Report** tabs but only has the rights as an operator in the **Admin** tab.

Operator

On the **Admin** tab, an operator cannot access the **Setup Security**, **Export File Settings**, **Email Preferences**, or any of the **Configuration** screens.

An operator cannot access the **Report** tab. This means that the operator cannot edit or create new report templates, or change the report template specified by the method while testing.

An operator has access to the **Test** tab, but not to the **Method** tab. This means that the operator cannot edit or create new test methods. An operator can change test parameters that are accessible from the test workspace. These changes cannot be saved to a test method but will be saved with the sample.

For example, if an operator changes the screen layout in the test workspace to show only the Graph and Test Inputs, the system saves the change in the sample but not the test method. If anyone opens the sample using the **Continue Sample** option, the layout shows the amended layout including only the Graph and Test Inputs. If anyone starts a new sample using the same test method that the operator used, the layout will show the original layout.

User privileges

Individuals with the same security level can have different privileges. The different privileges include:

- delete specimens

- change tested specimens

Delete specimens

This is not the same as excluding specimens. Excluding a specimen only removes the specimen from the statistics and the user can include the specimen again if necessary. If a specimen is deleted, its data is erased from the test data file and it cannot be recovered. Specimens in the sample are renumbered and there is no evidence of the deleted specimen. This may not be desirable if you need to comply with certain standards, so this feature lets you prevent users from deleting specimens.

Change tested specimens

The **Change tested specimens** security feature lets you limit the number of users that can change the specimen parameters after a specimen is tested. When this box is checked, the user can change the dimensions shown in the Test Inputs area after a specimen is tested and recalculate the results.

Alternatively, if you want to protect the system from obvious bad entries, such as entering 250mm instead of 25mm, you can assign bounds to these parameters that prevent operators from entering values outside the specified range.

Password criteria

A valid password must:

- be at least 5 characters in length

- contain only alphanumeric characters (as determined by the Windows locale setting)

Passwords are case-sensitive.

Author and user parameters

When there are several users with access to an Instron® system, Bluehill® provides the following parameters to identify the various users, and the last person to save changes to a method or sample:

Method author	Person who last saved the method. When you save a test method, your username is stored as the Method author and displays in the **Preview** when you open that method.
Sample author	Person who last saved the sample. When you finish a sample and save the data file, your username is stored as the Sample author and displays in the **Preview** when you continue a sample.
User	Person who is currently logged into the software. The name of the user displays in the status bar at the bottom of the screen.

The system uses these parameters only when security is enabled.

Reports

You can include the above parameters in reports that you create. To include these parameters in a report:

Method author	Select this parameter under the **Method** tab by clicking **Reports – Defaults Table** in the navigation bar. Method author is listed under the **General** parameter type under **Available Parameters**. Refer to note below.
Sample author	Select this parameter under the **Report** tab by clicking **Report – Body** in the navigation bar. Sample author is listed under **Available Parameters**.
User	This parameter can be added to a report in either the header or footer. Under the **Report** tab, click **Report – Header** (or **Report – Footer**) in the navigation bar. You can select User to display on the left, in the center, or on the right of the report.

*To have information from the Defaults Table display in a report, you must add the **Defaults Table** item to the **Report Content**. Under the **Report** tab, click **Report – Body** and select **Default Table** from the **Available items**.*

Enhanced test control

Overview

Normally, the testing system uses the Extension channel to control the crosshead/actuator movement. The optional Enhanced Test Control software module allows you to specify a different system channel, such as Load or Strain to control the crosshead/actuator movement. During a test, the system uses one of the three source transducers, depending upon the channel you have specified, to control the crosshead/actuator movement. The advantage of this feature is that the system can apply a force, strain, or stress, etc. at a constant rate. Enhanced Test Control is also available for the Pretest functions, Preload and Precycling.

Using enhanced control

To use the enhanced control feature, the module must be installed on your system and enabled by the configuration program. Once active, the **Setup Control - Test** screen appears as **Setup Enhanced Control - Test** and there are additional control channels in the **Control Mode** list.

When you select a derived or composite channel and start a test, the Load Frame icon changes to reflect the real channel source transducer that channel uses. For example, the system derives stress from load divided by the specimen's cross-sectional area. Therefore, if you specify stress as a control mode, the load frame icon changes to a load cell during a test.

Restrictions on enhanced control

1. Enhanced Test Control does not operate with the Peel, Tear and Friction test type.

2. You cannot remove an extensometer from a specimen while the system is using the extensometer as the control mode source transducer.

3. Video Strain is not available as a test control mode channel for any test type. However, if you have a video extensometer, Video Strain is available as a data source.

How the system creates a sample

The testing process can be described in three steps:

1. Choose a test method.

The test method contains all the test parameters that the system needs to run your tests and produce test results. The system copies the test parameters, stores them in memory, and uses that copy to run the tests. At this point there is no link to the test method.

2. Run the tests.

The system uses the test parameters copied from the test method to run tests on your specimens. The system collects and stores test data in temporary files as each specimen is tested.

3. Save the sample or finish the sample.

When you save a sample, the system saves the following information as part of the sample:

- All of the test parameters

- Raw data from the tests

- Calculated results

- If security is enabled, your username is saved as the sample author

When you finish a sample, the system saves all the above items and also generates the output indicated in the test method.

The sample file contains all the information necessary to reconstruct that sample.

What does this mean?

When you save a sample, the system saves the test parameters with the sample data. If, at a later date, you want to review that sample, or add some more specimens to it, you only need to open the sample. You do not need the original test method file.

What about prompts to save changes?

If you make changes to test parameters while you are testing and then close the sample, the system displays separate prompts for you to save the changes to both the sample and also to the test parameters. If you want to keep these changes as part of the sample, you must save the sample. The changes will be saved in the sample file.

However, you only need to save the test parameters if you want to save the changes to a test method for future samples. If you click **Yes**, a **Save As** dialog opens where you can create a new name for the test method, or overwrite the current method. This is not essential to saving the parameters with the sample.

What is the default specimen?

Default specimen versus individual specimens

Values of parameters for the Default Specimen are the values that are saved in a test method file.

Let's look at specimen width and thickness as example parameters. In our example test method, the values of width and thickness are set to 25mm and 5mm, respectively. These are the values for the Default Specimen. However, Width and Thickness also appear in the list of **Selected Parameters** in the **Setup Test Prompts - Test Workspace** screen.

If you now choose that method to start testing a new sample, width and thickness appear in the **Test Inputs** area of the test workspace for each specimen in the sample. By default, the values of width and thickness are set to 25mm and 5mm, but you can change those values for individual specimens. When the sample is saved at the end of testing, the values of width and thickness for each individual specimen are saved with the data and the width and thickness for the default specimen are saved as well. If you were to use the **Continue Sample** facility to test more specimens in that sample, all the dimensions for each of the tested specimens would be restored and the values for the default specimen would apply to any new specimens.

What happens to any individual values if I change values for the Default Specimen?

Let's continue with the example of width and thickness.

When you create specimens in a sample, they are given the default specimen width and thickness. In the **Test Inputs** area on the test workspace, you can enter different dimensions for any specimen before or after it is tested. You cannot enter dimensions for a specimen while that specimen is being tested.

Once the specimen has been tested the only way to change its dimensions is by entering new values in the **Test Inputs** area on the test workspace. Before it is tested, however, any changes that you make to the default specimen dimensions in the **Method** tab changes the dimensions for all untested specimens.

The Rule

When you change the default value of a parameter, the value of that parameter for untested specimens is always overwritten, regardless of whether that value was a default value or a value that you have entered.

For tested specimens, however, the value of that parameter is never overwritten and the only way that you can change the value for a tested specimen is to change it in the **Test Inputs** area on the test workspace.

Scenario

You are testing a sample and the default specimen width is 25mm. You enter a different value of width for specimen number 1 and start the test on that specimen. While the test is running, you create nine more specimens (using the **Add Specimen** feature) and enter different widths for specimen numbers 2 through 10, using the **Test Inputs** area on the test workspace. The first test ends and you run the second test. You now have 2 tested specimens. If you now go to the **Method** tab and change the default specimen width to 20mm, only the widths for specimens 3 through 10 are changed to 20mm.

How do Bounds on parameters work?

You can set bounds for a parameter to disallow entry of values outside those bounds, even though they may be valid entries for the system.

- If you set up and enable bounds when editing a test method and there is no sample open, the system only needs to check the validity of those bounds for the default specimen.

- If you set up and enable bounds while a sample if open, there may be specimens already created and the system needs to check the validity of parameter values for each specimen.

Error messages for Bounds

You can set bounds for a parameter to disallow entry of values outside those bounds, even though they may be valid entries for the system.

Cannot Enable Bounds

The system first checks for validity of any bounds when you try to enable them. You will encounter an error message if:

1. The default value of the parameter is outside the bounds. You can change the bounds or you can change the default value.

2. The default value is within bounds, but the value of the parameter for one or more individual specimens is outside the bounds. The error message shows you the highest and lowest values of that parameter and the specimen numbers of the specimens with those values. For a specimen that has been tested, you will have to go to the test

workspace and enter a new value. If all the specimens that are out of bounds haven't been tested yet, you could change the default value for the parameter and that will change the value for all untested specimens.

Cannot Change Bounds

You may want to change the value of the upper or lower bound while the bounds are enabled. In this case, the system searches to see if any existing specimens fall outside the bound value that you are entering. If any are found, an error message is displayed including the highest out-of-bounds value with its specimen number (for the upper bound) or the lowest out-of-bounds value with its specimen number (for the lower bound). The new bound value will not be entered until you have either disabled the bounds or changed the values for those specimens that are outside the new bounds.

Specimen dimensions for different geometries and test types

Each table covers one or more test types and the geometries available within those test types.

Tension, Tension Creep Relaxation, Tension Profile, Metals, Asphalt

Geometry	Dimension 1	Dimension 2	Dimension 3
Rectangular	Width	Thickness	Length
Circular	Diameter		Length
Double Shear Round	Diameter		Length
Tubular	Outer diameter	Wall thickness	Length
Irregular	Cross-sectional area		Length
Fiber	Linear density		Length

Compression, Compression Creep Relaxation, Compression Profile

Geometry	Dimension 1	Dimension 2	Dimension 3
Rectangular	Width	Thickness	Anvil height
Circular	Diameter		Anvil height

Geometry	Dimension 1	Dimension 2	Dimension 3
Double Shear Round	Diameter		Anvil height
Tubular	Outer diameter	Wall thickness	Anvil height
Irregular	Cross-sectional area		Anvil height

Flexure, Flexure Creep Relaxation

Geometry	Dimension 1	Dimension 2
Rectangular	Width	Thickness
Circular	Diameter	

Peel, Tear and Friction

Geometry	Dimension 1	Dimension 2
90° Peel	Width	
180° Peel	Width	
T-peel	Width	
Tear	Width	Thickness
Friction	Sled weight	

File reference

Test method files

Test method files contain all the information that the system needs to set up and run a test. Test method files from different test types are saved with different file extensions, as shown in the following table. Tension profile and Compression profile methods require an additional profile file.

Test Type	Method Files	
	Method	**Profile**
Asphalt	im_asphalt	-
Compression	im_comp	-
Compression Creep Relaxation	im_crelax	-
Compression Profile	im_ccyclic	cwf
Flexure	im_flex	-
Flexure Creep Relaxation	im_frelax	-
Metals	im_metal	-
Peel, Tear, Friction	im_ptf	-
Tension	im_tens	-
Tension Creep Relaxation	im_trelax	-
Tension Profile	im_tcyclic	twf

The default location for all test method files is:

Operating System	Default Location for Template Folder
Windows XP	`C:\Documents and Settings\All Users\` `Shared Documents\Instron\Bluehill\Templates`
Windows Vista	`C:\Users\Public\Documents\Instron\` `Bluehill\Templates`
Windows 7	`C:\Users\Public\Documents\Instron\` `Bluehill\Templates`

Test data files

Important - *Never rename the test data files using the Windows Explorer Rename function, as this will corrupt one or more data files. To save a sample under a different name, use the* **Continue Sample** *function to open the sample and click* **Save As** *in the test workspace to save the sample under a different name.*

If security is enabled, your username is saved as the sample author.

All test data is saved into data files. Test data files from different test types are saved with different file extensions, as shown in the following table.

Test Type	Sample Data Files	
	Sample	**Binary raw data**
Asphalt	is_asphalt	id_asphalt
Compression	is_comp	id_comp
Compression Creep Relaxation	is_crelax	id_crelax
Compression Profile	is_ccyclic	id_ccyclic
Flexure	is_flex	id_flex
Flexure Creep Relaxation	is_frelax	id_frelax
Metals	is_metal	id_metal
Peel, Tear, Friction	is_ptf	id_ptf
Tension	is_tens	id_tens
Tension Creep Relaxation	is_trelax	id_trelax
Tension Profile	is_tcyclic	id_tcyclic

A sample is defined by two sample data files (shown above for each test type), although the only one visible to you from the software is the sample file (is_tens in the case of a Tension test).

When you save a sample, the system saves the test parameters with the sample data. You can open a sample data file at any time to continue testing a sample using the test parameters with which it was tested originally (refer to).

During testing the test data is saved to the appropriate files as each specimen is tested. If the system fails during testing, due to a power loss or some other malfunction, you can use the **Continue Sample** function to resume testing on that sample. Data will only be lost if a specimen was under test when the malfunction occurred, and the only data lost will be from that specimen.

The default location for all test data files is:

Operating System	Default Location for Output Folder
Windows XP	`C:\Documents and Settings\All Users\` `Shared Documents\Instron\Bluehill\Output`
Windows Vista	`C:\Users\Public\Documents\Instron\` `Bluehill\Output`
Windows 7	`C:\Users\Public\Documents\Instron\` `Bluehill\Output`

Video files

When you record a test using a web camera, the video file becomes part of the test data and is saved when you save the sample. The system saves the video files under the same path as the sample (refer to section above) but to a sub-directory of the designated output directory. The sub-directory uses the sample name with avi added to the end. Video file names use the unique identifier the software assigns to each test with the .avi extension.

For example, a sample using a tension test method is saved as mysample.is_tens. The sub-directory for the video files is named mysample.is_tens_avi and the video files in this directory are saved using a unique identifier similar to:

> {95E45633-BAAE-4841-95DF-769DF75FE403}.avi

If you want to know the unique identifier for each test, you can add **Unique Identifier** as a column in the result table. You can find this parameter in the **General** hierarchy on the **Results** screen in the **Method** tab.

RLT file reference

This reference describes the Classic format for exporting results from Bluehill®. This format is identical to that used in Merlin™ software. However, some parameter names are slightly different in the new Bluehill files.

Similarities

Merlin and Bluehill Classic .RLT formats are identical in the following ways.

General

- Header rows precede the results.

- Header rows are comma separate name value pairs

- Each name is surrounded by double quote marks.

- Each value is surrounded by double quote marks.

Tables

1. Each table is preceded by either: "Table",1 or "Table", 2 depending on the table number.

2. This line is followed by a comma-separated list of column headings. The first column heading is always a blank string "".

3. The line of column headings is followed by a row for each specimen. This line is a comma-separated list of the results with the first result being the specimen number.

4. The specimen results are followed by rows of statistics. The statistics lines are a comma-separated list of the statistics with the first item in the row being the statistic name.

Differences

The following parameters have slightly different names.

Merlin	Bluehill
"Method Name:"	"Method Name"
"Sample Name:"	"Sample Name"
"User name"	"User"

The following parameters have slightly different default names but Bluehill methods can be modified to exactly match the Merlin names.

Merlin	Bluehill
"Note 1:"	"Sample note 1"
"Note 2:"	"Sample note 2"
"Note 3:"	"Sample note 3"
"Geometry:"	"Geometry"

The following parameters were removed from Bluehill and replaced with Custom Text Inputs. As these new parameters are specimen specific they are not included in the Bluehill RLT header.

- "Name:"

- "Operator ID:"

- "Company:"

- "Lab name:"

- "Test date:"

- "Temperature:"

- "Humidity:"

Example Bluehill .RLT file

```
"Test Type","Tension"
"Method Name",""
"Sample name","C:\Documents and Settings\All
Users\Documents\Instron\Bluehill\Templates\SAMPLE.is_tens"
"User","INSTRON"
"Sample note 1",""
"Sample note 2",""
"Sample note 3",""
"Geometry","Rectangular"
"Table:",1
" ","Extension at  Break (Standard) mm","Speed 1 mm/min"
"1",21.70,100.00
"2",16.65,100.00
"3",22.06,100.00
"4",17.35,100.00
"5",27.43,100.00
"6",22.76,100.00
"Mean",21.32,100.00
"Standard Deviation",3.94,0.00
"Coefficient of Variation",18.48,0.00
"Median",21.88,100.00
"Mean + Standard Deviation",25.27,100.00
"Mean – Standard Deviation",17.38,100.00
"Minimum",16.65,100.00
"Maximum",27.43,100.00
"Range",10.78,0.00
"Table:",2
" ","Maximum Load N"
"1",2153.41
"2",2155.31
"3",2185.01
"4",2160.29
"5",2150.79
```

```
"6",2210.90
"Mean",2169.28
"Standard Deviation",23.87
"Coefficient of Variation",1.10
"Median",2157.80
"Mean + Standard Deviation",2193.16
"Mean – Standard Deviation",2145.41
"Minimum",2150.79
"Maximum",2210.90
"Range",60.11
```

Example Merlin .RLT file

```
"Test Type","Tension"
"Method Name:","C:\INSTRON\user\template\ELASTOM1.MTA"
"Name:",""
"Operator ID:",""
"User name","INSTRON"
"Company:",""
"Lab name:",""
"Test date:","3/8/96"
"Temperature:",""
"Humidity:",""
"Note 1:",""
"Note 2:",""
"Note 3:",""
"Geometry:","Rectangular"
"Table:",1
" ","Extension at  Break (Standard) mm","Speed 1 mm/min"
"1",21.70,100.00
"2",16.65,100.00
"3",22.06,100.00
"4",17.35,100.00
"5",27.43,100.00
"6",22.76,100.00
"Mean",21.32,100.00
"Standard Deviation",3.94,0.00
"Coefficient of Variation",18.48,0.00
"Median",21.88,100.00
"Mean + Standard Deviation",25.27,100.00
"Mean – Standard Deviation",17.38,100.00
"Minimum",16.65,100.00
"Maximum",27.43,100.00
"Range",10.78,0.00
"Table:",2
" ","Maximum Load N"
```

```
"1",2153.41
"2",2155.31
"3",2185.01
"4",2160.29
"5",2150.79
"6",2210.90
"Mean",2169.28
"Standard Deviation",23.87
"Coefficient of Variation",1.10
"Median",2157.80
"Mean + Standard Deviation",2193.16
"Mean - Standard Deviation",2145.41
"Minimum",2150.79
"Maximum",2210.90
"Range",60.11
```

VersaChannel reference

VersaChannel is the Instron® name for a hardware and software option for Bluehill® that lets you create additional channels for your testing system and connect extra transducers to those channels.

A similar feature, named Multichannel, was available as a custom option in Merlin software.

The hardware for VersaChannel is a board that is installed in the computer. You connect your extra transducers directly to the board in the computer, not to the test machine controller as you would for standard load and strain transducers. This difference in connection means that the configuration and operation of extra transducers is different from the standard transducers.

VersaChannel overview

To enable VersaChannel, go to the **Admin** tab and select **Configuration** followed by **Options**. If you have purchased the VersaChannel option, a **VersaChannel** checkbox displays in this screen. When you check the box a new item, **VersaChannel**, appears in the navigation bar. When you select this item, the **VersaChannel Configuration** screen displays to let you create and configure your additional channels.

Creating additional channels

When you create additional channels, you need to specify a channel name, the channel type and the range of the transducer that is connected to it.

You can use any of these channels in a test method in the same way as any other channel in the system. You might use one, for example, as the trigger for a changeover from Ramp 1 to Ramp 2 in a test. The software saves this information in the test method and it uses its own unique channel identifier; it does not use the channel name that you assign. Therefore if you configure Channel1 to be a load channel named MyLoad and you use that channel as a changeover criterion, the software saves the channel reference as Channel1. If you then run the test method on a testing system where Channel1 is configured as something different to the original configuration, especially if it is not a load channel, the test will not perform as expected.

You may want to include information about the VersaChannel Configuration in the **Sample Description** field so that you can be sure that any method or sample is compatible with the configuration of any testing system that runs it.

Setting up extra transducers

The process of setting up extra transducers is very similar to that for standard transducers, but the difference in the method of connection means that the software cannot detect when an extra transducer has been disconnected. Therefore, when you set up an additional channel the software always assumes that a transducer is connected to that channel, unless you uncheck the **Connected** box in the **Extra Transducer Setup** dialog. If you disconnect a transducer and do not uncheck the box, the software still expects a calibrated transducer to be connected to that channel. If there has been a valid calibration previously, the test will start and the software will collect meaningless data from that channel. If there is no previous calibration, the test will not start.

Transducer connection grid

The following table maps the VersaChannel channel numbers to the BNC connections.

Channel Number	Single-ended	Differential
1	AI 0	AI 0 - AI 8
2	AI 1	AI 1 - AI 9
3	AI 2	AI 2 - AI 10
4	AI 3	AI 3 - AI 11

Channel Number	Single-ended	Differential
5	AI 4	AI 4 - AI 12
6	AI 5	AI 5 - AI 13
7	AI 6	AI 6 - AI 14
8	AI 7	AI 7 - AI 15
9	AI 8	-
10	AI 9	-
11	AI 10	-
12	AI 11	-
13	AI 12	-
14	AI 13	-
15	AI 14	-
16	AI 15	-

Changeovers between ramps

This section and following subsections are specific to the metals test type.

Changeover

The Changeover controls let you specify the conditions at which the test changes from the currently set control mode and/or rate to a new control mode and/or rate.

You can specify the following change criteria:

Changeover criterion	Notes
Extension	Absolute value of crosshead displacement
Tensile Extension	Absolute value of tensile extension
Strain 1 or 2	Absolute value of strain
Tensile Strain	Absolute value of tensile strain

Changeover criterion	Notes
Load	Absolute value of load
Tensile Stress	Absolute value of stress
Time	Absolute value of time
At extensometer removal	Removal point for the extensometer
True Stress	Absolute value of true stress. Not available on 8800
True Strain	Absolute value of true strain. Not available on 8800
Offset Yield	User specified offset yield. Since Offset Yield may not always be detected, a **Changeover override** (an absolute value of tensile strain) is available.
Upper Yield (not available for **Changeover 2 to 3**)	Upper yield plus some lag in % strain. Since Upper Yield may not always be detected, a **Changeover override** (an absolute value of tensile strain) is available. The change over to the next ramp can be delayed by a specific factor by entering the factor in the **Delay change by** field.
% of Lower Yield Stress (not available for **Changeover 2 to 3**)	User specified percentage of the lower yield stress. The changeover occurs when the test reaches the specified percentage after detecting the lower yield. Since the lower yield may not always be detected, a **Changeover override** (an absolute value of tensile strain) is available. If the percentage of lower yield stress is not detected, then the changeover occurs at 10% strain.

Changeover override

The **Changeover override** is an alternative changeover criterion at an absolute value of tensile strain that is available when Upper Yield, Offset Yield, or % of Lower Yield Stress is selected as the Changeover (1 to 2) criterion. The override forces a change to the last enabled ramp at the selected value of tensile strain if the software does not detect an Upper Yield, Offset Yield, or Lower Yield before reaching this value. If Upper Yield, Offset Yield, or Lower Yield is detected first, then the override value is ignored. The ramp switch occurs at whichever point is found first, the selected changeover value (upper yield, offset yield, % of lower yield stress) or the override value.

The range of this tensile strain value is 0.0% - 10%.

*If the system finds the override value before the upper yield, offset yield or lower yield point, the system immediately switches ramps. However, if the upper yield point is found first and a delay value is specified in the **Delay change by** field, then the switch occurs after the delay.*

Delay change by

When the Metals test type detects the upper yield point, it calculates the strain value at that point. If the **Delay Change By** value is 0, the changeover to the next ramp occurs immediately. If you want to delay the point at which the changeover to the next ramp occurs, enter the additional percentage of strain required to meet the desired changeover value.

Interval testing reference

General

Interval testing is only allowed in peel testing to divide a test that is performed on one physical specimen into several intervals, each of which is then treated as an individual specimen. This lets you calculate results on each of these intervals as if they were separate specimens. You decide where the boundaries of these intervals are as the test is running, either by observing the runtime graph or by observing the specimen, and you use a device (called a pipping device) to insert a PIP mark into the data. The device is operated by a hand-held button or a foot-operated switch and is connected to the testing machine via the PIP connector on the load frame.

Features

When you divide a specimen into intervals you can:

- Calculate results on the each interval separately because each interval is treated as a single specimen.

- Set the End of Test criteria to be a specified number of PIP marks.

- Show the PIP marks on the graph.

Setting up the test

When you check the Divide each specimen into intervals box, two additional fields appear that let you configure the interval testing.

Which PIP ends first interval?

You can choose to have the first or second PIP define the end of the first interval. If you want the first PIP to mark the beginning of the first interval, then you can choose **Second** in this field.

Data after last PIP

You need to decide whether to include the data after the last PIP in each set of intervals. You can choose to always include that data by converting it to an interval, always exclude it by ignoring it, or you can choose the ask the tester after each set of intervals whether to include the data after the last PIP or not.

Whatever you choose in this field, all the data from the test is saved to the raw data file, no data is discarded.

Description of the test

You run a test on a specimen in the normal way. When the test has ended, the software divides the original specimen into a number of specimens, defined by the PIP marks and your choices in **End of Test** fields. In this way, the software then treats the intervals as individual specimens and the original specimen is treated as a sample, i.e. a group of specimens.

System ID reference

The location of the system ID number varies with frame model. The following table tells you where to look on the frame.

Frame	System ID location
4201, 4202	Back of frame, left side looking from back
4204	On top of frame base, on right side looking from front
4206	On tipout panel on right side of frame looking from front
4208, 4210	On top of base of frame behind right column, looking from front
4301, 4302	On back of frame below console
4442, 4443, 4444	On back of motor cover located on back of frame
4464, 4465, 4466, 4467, 4469	On back right side of frame above power input cable
4481, 4482, 4484, 4485	On right side of frame above power input cable
5642, 5643, 5644	On right side of base looking from the front, on back of motor cover, and on back of card cage
5664, 5665, 5666, 5667, 5669	On back right side of frame above power input cable and on back of crosshead

Frame	System ID location
5681, 5682, 5684, 5685	On back right side of frame looking from the front, on back of crosshead, and on back of card cage
5542, 5543, 5544	On right side of base looking from the front, on back of motor cover, and on back of card cage
5564, 5565, 5566, 5567, 5569	On back right side of frame above power input cable and on back of crosshead
5581, 5582, 5584, 5585	On back right side of frame looking from the front, on back of crosshead, and on back of card cage
3342, 3343, 3344, 3345	On right side of base looking from the front
3365, 3366, 3367, 3369	On back right side of frame above power input cable and on back of crosshead
3382, 3384, 3385H	On back right side of frame looking from the front, and on back of crosshead

Chapter 8
Channel Reference

This section provides greater detail about channels and how the system handles them. This section contains the following topics:

Channels used as inputs for calculations

The channel designated for Stress, Load, Strain and Extension varies according to the test type as follows:

Test Type	Stress Channel	Load Channel	Strain Channel	Extension Channel
Tension, Tension Creep Relaxation, Tension Profile, Asphalt,	Tensile Stress (or Tenacity for fiber specimens)	Load	Tensile Strain	Tensile Extension
Compression, Compression Creep Relaxation, Compression Profile	Compressive Stress	Compressive Load	Compressive Strain	Compressive Extension
Flexure, Flexure Relaxation	Flexure Stress	Flexure Load	Flexure Strain	Flexure Extension
Peel, Tear and Friction	Load/Width (or Load for Friction tests)	Load	Peel Extension (or Extension for Friction tests)	Peel Extension (or Extension for Friction tests)

How does the system handle channels?

The factors that affect the number of channels available in various parts of the user interface are:

- the connected transducers

- the test type

- the controller type

- the Enhanced Test Control Option

- the VersaChannel Option

Real channels

Real channels supply data from physical transducers connected to your testing system. These are Extension (Electromechanical Systems only), Position (Servohydraulic Systems only), Load, Strain 1, Strain 2 and Video Strain. Extension, Position and Load are always available, Strain 1, Strain 2 and Video Strain are only available when the appropriate strain card is installed. Time is also considered to be a real channel.

Derived channels

The following description assumes a Tension test type. Refer to "Types of channels" on page 8-5 for details of how other test types differ from this.

Derived channels supply data about the specimen that is calculated mathematically from the measurements made from real channels. For example, stress is derived by dividing the readings of the load channel by the cross-sectional area of the specimen. If you do not have an extensometer connected to your system, the system derives values of strain by dividing measurements from the extension channel by the gauge length of the specimen. Other derived channels include average strain and differential strain; these are available only if you have both Strain 1 and Strain 2 cards installed.

The derived channels available in the Tension test are the following:

Derived Channel	Derivation/Explanation
Tensile Stress	Load/specimen cross-sectional area
Tenacity	Load/linear density
Transverse Strain	Transverse Strain Source * Source Gauge Length/Transverse Gauge Width Value

Derived Channel	Derivation/Explanation
Transverse Extension	Transverse Strain * Transverse Gauge Width Value
Displacement (Strain 1)and Displacement (Strain 2)	Strain 1 * Strain Source Gauge Length Strain 2 * Strain Source Gauge Length
Average Strain	(Strain 1 + Strain 2)/2
Differential Strain	Strain 1 - Strain 2
True Strain	ln(1 + tensile strain)
True Stress	Load(1 + tensile strain)/initial specimen cross sectional area
Cycle Count	A count of all triangles run during the current block. Each time a new triangle block is executed in profiler, the cycle count is reset to zero. Cycle count counts the number of precycles too.
Total Cycle Count	A running count of all triangles run during the current test. Total cycle count is set to zero when a new test is started and does not include precycle cycles.
Repetitions Count	Counts the repetitions of the profile.

Composite channels

The following description assumes a Tension test type. Refer to "Types of channels" on page 8-5 for details of how other test types differ from this.

A composite channel is one that can change the source of its information during a test. There are two composite channels in the Tension test; Tensile Strain and Tensile Extension.

Tensile Strain is a channel that you define in the Setup Control - Strain screen within the **Method** tab.

If you assign the Extension channel to Tensile Strain, then values of strain are calculated for the entire duration of the test by dividing values of crosshead/actuator extension by the specimen gauge length.

If you assign a channel with an extensometer connected to it (Strain 1, for example) as Tensile Strain and you do not remove the extensometer during the test, then values of strain are derived directly from the extensometer for the entire duration of the test.

If you assign a channel with an extensometer connected to it as Tensile Strain and you choose to remove that extensometer at a specified point in the test, the system must change the method of calculating Tensile Strain during the test. The system operates as follows:

1. Up to the point of extensometer removal, values of Tensile Strain are derived directly from readings from the extensometer assigned to it.

2. After the removal point, the system uses extension measurements from crosshead/actuator movement. The extension readings are corrected and normalized using the "Extensometer removal correction algorithm" on page 8-12.

Tensile Extension is calculated from Tensile Strain. If you choose to assign the Extension channel to Tensile Strain, you would expect Tensile Extension to be the same as extension measured from movement of the crosshead/actuator. This is the case provided that:

- you have not enabled Auto Balance in the Setup Control - Strain screen

- you have not chosen a slack correction calculation which corrects the gauge length in the Setup Results Columns screen

If you choose to assign Tensile Strain to a channel with an extensometer connected, then Tensile Extension is the extension of the specimen within the extensometer gauge length. In the same way as for Tensile Strain, values of Tensile Extension are corrected and normalized if you decide to remove the extensometer at a specified point during the test.

You cannot choose to remove the extensometer during preload or precycling.

Availability of channels

The list of channels offered to you in any particular screen varies depending upon the function involved. For example, the list offered for the live displays contains more choices than that offered for precycling channels.

Enhanced test control channels

In a testing system that does not have the Enhanced Test Control software module installed, the Extension channel controls the crosshead/actuator movement. If you install and enable the Enhanced Test Control module, and if the controller supports it, the system can use any of the three types of real channel source transducers to control the crosshead/actuator movement. In addition to the real channels, the software allows you to specify some derived and composite channels as test control modes.

The following are the real channel source transducers:

- Extension channel - motor encoder

- Load channel - load cell

- Strain channel - extensometer (not video extensometer)

VersaChannel channels

The VersaChannel option lets you specify additional channels. These are real channels and can be one of three types; load, strain and user-defined. For every Strain channel that you create, the system creates an additional, derived Displacement (Strain) channel.

Types of channels

A channel can be one of three types; real, derived or composite, as described in the following sections.

Real channels

Definition

A real channel is a test data channel measured directly from the transducers that monitor the specimen. For example, load from the load cell, strain from the extensometer.

A real channel can be a source of data for a derived channel. For example, Stress is derived from Load divided by the specimen cross-sectional area.

List

Extension	The location of the crosshead/actuator relative to the point where the gauge length is reset. Extension is a real channel on an electromechanical system. Extension is derived from position on servohydraulic systems.
Load	The force the testing system exerts on the specimen. Load is a real channel. The testing system uses a load cell to measure force.
Position	Records the absolute position of the actuator. Position is a real channel. This channel is available in servohydraulic systems only.
Strain	The change in specimen length divided by the original length. Strain is a real channel. You normally use an extensometer to measure strain, where the extensometer has a specific gauge length.

Derived channels

Definition

A derived channel is a test data channel calculated using data from the transducers that monitor the specimen. For example, stress is derived using load data from the load cell, average strain is derived by dividing the sum of two strain channels.

Some derived channels are specific to the test type. For example, flexure stress is derived from load divided by an outer fiber stress factor.

List

Average Strain	Average strain is a derived channel. Calculated as the average value of the output from two extensometers. (Strain 1 + Strain 2)/2
Compressive Load	Compressive load is a derived channel calculated as the standard load with the sign inverted. Compressive load is reported using positive values for increasing compression. The compressive load channel is available in the following test types: • Compression • Compression Creep Relaxation • Compression Test Profile Load with sign inverted
Compressive Stress	Compressive stress is a derived channel calculated as compressive load divided by the cross-sectional area of the specimen. Compressive stress increases as the compressive load on the specimen increases. The compressive stress channel is available in the following test types: • Compression • Compression Creep Relaxation • Compression Test Profile Compressive load/cross-sectional area
Cycle Count	A count of all triangles run during the current block. Each time a new triangle block is executed in profiler, the cycle count is reset to zero. Cycle count counts the number of precycles too.
Differential Strain	Differential strain is a derived channel calculated as the difference between the output of two extensometers. Strain 1 - Strain 2.

Displacement (Strain 1) and Displacement (Strain 2)	Displacement (Strain 1 or Strain 2) is a derived channel, calculated by taking the value of the real strain channel and multiplying it by the gauge length of the device.
	For every Strain sensor that the system contains (except for Automatic or Video extensometers), the system creates an equivalent Displacement (Strain) sensor. In most systems this would be Strain 1 and Strain 2, but there may be additional strain sensors created using the VersaChannel feature.
	If you want to report values from a device connected to a strain input in terms of displacement, you should select the appropriate Displacement (Strain) channel.
Flexure Load	Flexure load is a derived channel calculated as the standard load with the sign inverted.
	Flexure load is reported using positive values for increasing compression.
	Flexure load channel is available in the following test types:
	• Flexure
	• Flexure Creep Relaxation
	Load with sign inverted
Flexure Stress	Flexure stress is a derived channel calculated as flexure load divided by an outer fiber stress factor.
	Flexure load is reported using positive values for increasing compression.
	Flexure stress channel is available in the following test types:
	• Flexure
	• Flexure Creep Relaxation
	For rectangular specimens in a 4-point bend test:
	Flexure stress = Flexure load * 1.5 *(1 - load span/support span) * (support span)/ (width * thickness^2)
	For rectangular specimens in a 3-point bend test:
	Flexure stress = Flexure load * 1.5 *(support span)/(width * thickness^2)
	For cylindrical specimens in a 4-point bend test:
	Flexure stress = Flexure load * 8 *(1 - load span/support span) * (support span)/(π * diameter^3)
	For cylindrical specimens in a 3-point bend test:
	Flexure stress = Flexure load * 8 *(support span)/(π * diameter^3)
Load/Width (Peel, Tear and Friction test type only)	Load/Width is a derived channel calculated by dividing the readings of the load channel by the width of the specimen.
Peel Extension (Peel, Tear and Friction test type only)	Peel extension is a derived channel calculated as extension divided by a peel factor.
	The value of the peel factor varies according to specimen geometry. For 90° peel specimens and friction specimens, the peel factor is 1. For 180° peel specimens, T-peel specimens and tear specimens, the peel factor is 2.
Repetitions Count	Counts the repetitions of the profile.

Tenacity	Load divided by linear density.
	Tenacity is a derived channel. The testing system calculates tenacity using the measured load and the value of linear density that you enter into the test application.
	Tenacity is a measure used in the testing of fibers and is therefore only available in those test types where fibers can be tested.
	Tenacity channel is available in the following test types:
	• Asphalt
	• Tension
	• Tension Creep Relaxation
	• Tension Test Profile
Tensile Stress	Tensile stress is a derived channel. calculated as load divided by the cross-sectional area of the specimen.
	Tensile stress increases as the load increases on the specimen.
	The tensile stress channel is available in the following test types:
	• Asphalt
	• Tension
	• Tension Creep Relaxation
	• Tension Test Profile
	• Metals
Total Cycle Count	A running count of all triangles run during the current test. Total cycle count is set to zero when a new test is started and does not include precycle cycles.
Transverse Strain	Transverse strain is a derived channel. It is measured in a direction perpendicular to the applied load.
	Transverse Strain = Transverse Strain Source * Source Gauge Length/Transverse Gauge Width Value.
	For example, if Strain 1 is the source channel for Transverse Strain then:
	Transverse Strain = Strain 1 * Strain 1 Gauge Length/Transverse Gauge Width Value.
	The transverse gauge width value can be set to a specimen dimension (e.g. width, thickness) or a manually entered value.
	The transverse strain channel is available in the following test types:
	• Asphalt
	• Compression
	• Compression Creep Relaxation
	• Compression Test Profile
	• Metals
	• Tension
	• Tension Creep Relaxation
	• Tension Test Profile

Transverse Extension	Transverse extension is a derived channel. The extension is calculated from the transverse strain sensor by multiplying the transverse strain by transverse gauge width value.
	The transverse extension channel is available in the following test types:
	• Asphalt
	• Compression
	• Compression Creep Relaxation
	• Compression Test Profile
	• Metals
	• Tension
	• Tension Creep Relaxation
	• Tension Test Profile
True Strain	True strain is a derived channel that is available with the Enhanced Test Control Module. The system derives true strain from composite channels in different test types as follows:
	• Tension test types (including Asphalt) and the Metals test type use Tensile Strain
	• Compression test types use Compressive Strain
	It is assumed that composite strain is equivalent to engineering strain.
	The system calculates the true strain channel value by applying the appropriate composite strain channel in the following formulas:
	Tension and Metals Test Types (including Asphalt)
	True Strain = ln (1 + composite strain)
	Compression Test Types
	True Strain = -ln (1 - composite strain)
	You can specify the true strain channel as a control mode in the Metals, Asphalt, Tension, Tension Creep Relaxation, Compression and Compression Creep Relaxation test types.
True Stress	True stress is a derived channel that is available with the Enhanced Test Control Module. The system derives true stress from the load cell and a composite strain channel in different test types as follows:
	• Tension test types (including Asphalt) and the Metals test type use Tensile Strain
	• Compression test types use Compressive Strain
	It is assumed that composite strain is equivalent to engineering strain.
	The system calculates the true stress channel value by applying the appropriate composite strain channel in the following formulas:
	Tension and Metals Test Types (including Asphalt)
	True Stress = (load * (1 + composite strain))/(initial specimen cross-sectional area)
	Compression Test Types
	True Stress = (load * (1 - composite strain))/(initial specimen cross-sectional area)

Composite channels

Definition

A composite channel is a test data channel that can change its information source during a test. For example, the composite channel Tensile Strain lets you measure strain directly from an extensometer during the first part of a test, then calculate strain from the extension of the crosshead for the remainder of the test. Thus the total strain measurement is a composite of the real strain channel and the derived strain from extension channel.

List

Compressive extension	Compressive extension is a composite channel calculated from compressive strain multiplied by the anvil height.
	Compressive extension is reported using positive values for increasing compression.
	The compressive extension channel is available in the following test types:
	• Compression • Compression Creep Relaxation • Compression Test Profile
Compressive strain	Compressive strain is a composite channel. You can choose any strain channel as a source channel for compressive strain. If your source channel is an extensometer, you can choose to remove the extensometer during a test; from this point compressive strain measurement continues using the extension channel as the source. The extension readings are corrected and normalized using the Extensometer Removal Correction Algorithm. Refer to "Extensometer removal correction algorithm" on page 8-12 for more detail.
	Compressive strain increases as the specimen compresses.
	The compressive strain channel is available in the following test types:
	• Compression • Compression Creep Relaxation • Compression Test Profile
Flexure extension	Flexure extension is a composite channel calculated from flexure strain multiplied by an outer fiber strain factor.
	Flexure extension is reported using positive values for increasing compression.
	The flexure extension channel is available in the following test types:
	• Flexure • Flexure Creep Relaxation

Flexure strain	Flexure strain is a composite channel. You can choose any strain channel as a source channel for flexure strain. If your source channel is an extensometer, you can choose to remove the extensometer during a test; from this point flexure strain measurement continues using the extension channel as the source. The extension readings are corrected and normalized using the Extensometer Removal Correction Algorithm. Refer to "Extensometer removal correction algorithm" on page 8-12 for more detail.
	Flexure strain is reported using positive values for increasing compression.
	The flexure strain channel is available in the following test types:
	• Flexure
	• Flexure Creep Relaxation
	Note: *When using a 4-point bend fixture for flexural testing, you should use a deflectometer to measure the specimen deflection directly at the mid-span point on the specimen. You must set up the method to use output from the deflectometer as the Axial Strain Source. If you don't use a deflectometer, the software uses the crosshead extension at the point of contact of the fixture, which may be significantly different from the specimen deflection at mid-span.*
	For rectangular specimens in a 4-point bend test:
	Flexure strain = Deflection * thickness * 12/(support span^2*(3 - (1 - load span/support span)^2))
	For rectangular specimens in a 3-point bend test:
	Flexure strain = Deflection * thickness * 6/support span^2
	For cylindrical specimens in a 4-point bend test:
	Flexure strain = Deflection * diameter * 12/(support span^2*(3 - (1 - load span/support span)^2))
	For cylindrical specimens in a 3-point bend test:
	Flexure strain = Deflection * diameter * 6/support span^2

Tensile extension	Tensile extension is a composite channel calculated from tensile strain multiplied by the specimen gauge length.
	The tensile extension channel is available in the following test types:
	• Asphalt
	• Tension
	• Tension Creep Relaxation
	• Tension Test Profile
	• Metals
Tensile Strain	Tensile strain is a composite channel. You can choose any strain channel as a source channel for tensile strain. If your source channel is an extensometer, you can choose to remove the extensometer during a test; from this point tensile strain measurement continues using the extension channel as the source. The extension readings are corrected and normalized using the Extensometer Removal Correction Algorithm. Refer to "Extensometer removal correction algorithm" on page 8-12 for more detail.
	Tensile strain increases as the specimen stretches.
	The tensile strain channel is available in the following test types:
	• Asphalt
	• Tension
	• Tension Creep Relaxation
	• Tension Test Profile
	• Metals

Extensometer removal correction algorithm

The extension readings made after the removal of the extensometer are corrected and normalized using the following algorithm.

The extension value written into the raw data file after the point of extensometer removal is calculated as follows:

1. A correction value is determined by checking the last data point "p" before removal of the extensometer. At point "p", both crosshead extension and strain are read.

2. Strain measured from the extensometer at point p is:

   $\varepsilon p = EXTp / Le$

   where εp is the strain and EXTp is the extension at point "p" for the section of specimen between the extensometer knife edges, and Le is the extensometer gauge length.

3. Strain measured from crosshead extension at point p is:

   $\varepsilon(XHD)p = Dp / Lo$

where $\varepsilon(XHD)p$ is the strain, Dp is the crosshead extension and Lo is the specimen gauge length.

4. To conserve consistency in what is written into the data file, for all points after extensometer removal, the extension read from crosshead (D) is normalized to that section of the specimen between the extensometer knife edges. That is, a scaling factor of (Le / Lo) is applied to any extension reading from the crosshead.

5. For an ideal specimen, strain is the same throughout, so it follows from steps (2) and (3) that:

$\varepsilon p = \varepsilon(XHD)p$

which means that EXTp / Le = Dp / Lo
and so rearranging, this becomes EXTp = Dp x (Le /Lo)

6. Since the specimen is not likely to be ideal, the software defines an offset correction as:

Correction value = EXTp – [Dp x (Le / Lo)]
which is applied to the extension value for all data points after point "p".

7. Therefore, the extension data for the section of the specimen between the extensometer knife edges is given by:

Extension = [D x (Le / Lo)] + correction value
that is,
Extension = (D - Dp) x (Le / Lo) + EXTp
where D is the extension read from the crosshead.

Note that adding the correction value to the normalized crosshead extension at point "p" yields the extension at "p" which is actually calculated from the strain value obtained from the extensometer, so the test curve is connected through that point.

Chapter 9
Prompted Tests

This section describes how to best utilize the prompted test functions, either by using a fully prompted test or by using test prompts within a freeform test. For information regarding setting up a prompted test sequence, refer to "Setup a prompted test sequence" on page 4-69. For information on running tests in the prompted workspace, refer to "Prompt workspace" on page 5-9. This section contains the following topics:

Setup Test Prompts - Overview

Test prompts can be used in two different ways; either in a fully prompted test or in a freeform test.

Freeform test

The only prompts available in a freeform test are those that you can add to the Test Inputs area of the test workspace. You set these up in the **Setup Test Prompts - Test Workspace** screen, which is the only screen available in the **Test Prompts** area of the navigation bar when you are not running a prompted test.

Prompted test

When you set the method to run as a prompted test, several more screens become available in the Test Prompts area of the navigation bar. These let you set up a fully prompted test, rather like a wizard, that overlays the test workspace during testing. The **Setup Prompted Test Sequence** screen lets you set up the number of steps in the wizard. The **Test Prompts** screens let you set up the content of each screen within the wizard. The prompted

test provides a logical linear progression of screens, directing the operator to enter certain parameters at certain points in a test sequence.

The full series of screens is as follows:

Screen name	Function
Setup Prompted Test Sequence	Toggle between a freeform test and a prompted test. Set the number of specimens in the sample. Enable individual prompt screens within the prompted test wizard.
Test Prompts - Before Start	Prompt for parameters that are the same throughout the sample and needed before testing.
Test Prompts - Before Specimen	Prompt for parameters for each specimen before it is tested.
Test Prompts - Before Test	Pause before starting test with instructional message to operator to, for example, attach an extensometer. You can also prompt for parameters for each specimen before it is tested.
Test Prompts - Before Calculations	Prompt for parameters for each specimen after it is tested but before performing calculations (e.g. final dimensions).
Test Prompts - After Specimen	Prompt for parameters for each specimen after it is tested (e.g. excluding the specimen).
Test Prompts - At Finish	Prompt for parameters that apply only to the entire sample (e.g. a sample note)

Each prompt setup screen has one or more of the following components:

- An instructional message for the operator.

- A pick-list from which you can choose parameters that you want the operator to enter in that screen. You can also change the **Prompt** and **Default value** for any of the parameters (for example change the prompt for **Text Input 1** to **Specimen Color** with a **Default value** of **White**).

Refer to "Setup a prompted test - Examples" on page 9-5 for example scenarios and test sequences using the prompted test.

Prompted test or Freeform test - which should I use?

Freeform test

Description

The Freeform test is so named because it lets you enter test parameter values and run tests on specimens in a very flexible way. You can, for example, enter specimen dimensions at any time and go backwards and forwards between specimens, tested and untested, changing values and recalculating results. There are no prompts to finish the sample after a certain number of specimens have been tested. The operator clicks the **Finish** button when he wants to finish the sample.

Advantages

This format produces a very flexible format. You can set up a test method, using the **Setup Test Prompts - Test Workspace** screen, where parameters for each specimen appear in the **Test Inputs** component of the test workspace and these parameters can be entered by the operator at any time. If the operator notices unexpected values in the results table, for example, which might be caused by error in entering specimen dimensions, he can go back to that particular specimen, change the dimensions and recalculate the results. Similarly, while a test is being run on one specimen, the operator can enter the dimensions for subsequent specimens for faster specimen throughput.

Disadvantages

Due to the freeform nature of the testing, it is more likely that an operator might forget to enter some information during testing.

Prompted test

Description

The Prompted test is a very structured way of running tests consisting of a series of prompts for the operator to enter parameter values at specific times and in a specific order. Typically an operator would be prompted to enter the number of specimens in the sample at the start, then enter specimen dimensions before testing each specimen and perhaps enter a comment after testing each specimen. When the specified number of specimens have been tested, the operator is prompted to finish the sample. The test method can also be set up to prompt the operator for more information at the finish sample stage.

Advantages

The structured format of the prompted test lets you set up test methods that fully prompt the operator at each stage in the testing. This means that test methods set up in this way can be used by operators who are less familiar with the software or with materials testing in general. The prompted format leaves less scope for omissions by the operator.

Disadvantages

The prompted test format is somewhat inflexible and does not allow the operator to revisit a specimen, for example, to edit the specimen dimensions.

Example of how to use Test Prompts in the freeform test

Scenario

You want to set up a test method with the following:

- a place where the operator can enter a comment about each test.

- specimens are color-coded, so you need to record a color for each one. The most-frequently tested ones are white.

- nominal specimen width is 15mm, but can vary from specimen to specimen.

- nominal specimen thickness is 3mm, but can vary from specimen to specimen.

Setup

Go to the **Setup Test Prompts - Test Workspace** screen.

In the **Available Parameters** list:

1. Highlight **Width** and add it to the **Selected Parameters** list.

2. Highlight **Thickness** and add it to the **Selected Parameters** list.

3. Highlight one of the **Custom Text Inputs** and add it to the **Selected Parameters** list.

4. Highlight another **Custom Text Input** and add it to the **Selected Parameters** list.

In the **Selected Parameters** list:

1. Highlight the first **Custom Text Input**. Change **Prompt:** to **Color:**, change **Default value:** to **White**.

2. Highlight the second **Custom Text Input**. Change **Prompt:** to **Comment:**, change **Default:** to **As expected**.

Setup a prompted test - Examples

Example 1

What you want to do

- The operator will be testing samples varying in size from 5 through 10 specimens, but most often the number of specimens in a sample will be 10.

- The operator needs to enter width and thickness for each specimen before testing it and final width and final thickness after the test.

- The operator must be able to exclude specimens based on observing the calculated results and enter a comment to document the reason for exclusion.

How you set it up

- In the **Setup Prompted Test Sequence** screen, check the **Run as a prompted test** box. More checkboxes appear.

- Check the following boxes:

  Prompt before start
  Prompt before specimen
  Prompt before test
  Prompt before calculations
  Show workspace after calculations
  Prompt after specimen

- In the **Setup Test Prompts - Before Start** screen, add **Number of specimens in sample** to the **Selected** list and set the default to 10.

- In the **Setup Test Prompts - Before Specimen** screen, add **Width** and **Thickness** to the **Selected** list and set their default values to the most common values that the operator will encounter.

- In the **Setup Test Prompts - Before Test** screen, enter any text that you want to prompt the operator.

- Similarly, in the **Setup Test Prompts - Before Calculations** screen, add **Final width** and **Final thickness** to the **Selected** list and set their default values to the most common values that the operator will encounter.

- In the **Setup Test Prompts - After Specimen** screen, add **Exclude** and **Specimen note 1** to the **Selected** list.

Full details of how to add and set up these screens are in the topics describing each screen.

How the test runs

1. When the operator has chosen the test method and named the test data file, the **Before Start** screen displays prompting for the **Number of specimens in sample**.

2. The operator enters the number and clicks the **Next** button.

3. The **Before Specimen** screen for Specimen 1 displays prompting for **Width** and **Thickness**.

4. The operator enters the values and clicks the **Next** button.

5. The **Before Test** screen displays. The operator installs the specimen and clicks the **Start Test** button.

6. After the test has run, the **Before Calculations** screen displays prompting for **Final width** and **Final thickness**.

7. The operator enters the values and clicks the **Next** button.

8. The test sequence pauses to show the test workspace (**Show workspace after calculations** checkbox). This lets the operator view the results for the specimen that has just been tested and decide if it is a valid specimen.

9. The operator clicks the **Next** button.

10. The **After Specimen** screen displays prompting the operator to exclude the specimen and enter a comment (**Specimen note 1**) if necessary.

11. The operator enters whatever is needed and clicks the **Next** button.

12. The **Before Specimen** screen for Specimen 2 displays prompting for **Width** and **Thickness**.

13. The sequence continues for each specimen until all specimens have been tested. When the last specimen has been tested, the software moves on to prompt the operator that the value entered for **Number of specimens in sample** has been reached. The operator can choose to finish at this point or continue testing.

14. Assuming that the operator chooses to finish, the test data file is saved and the test sequence ends.

Example 2 - using Show All Parameters feature

What you want to do

You have two types of specimen that you test; rectangular and circular. In all other respects the test method that you want to create for these specimens is identical.

You want your operator to be able to use the method for both types of specimen, but you don't want the operator to have access to any other method parameters, such as test control.

How you set it up

- In the **Setup Prompted Test Sequence** screen, check the **Run as a prompted test** box. More checkboxes appear.

- Check the following boxes:

    Prompt before start
    Prompt before test
    Prompt before specimen
    Show workspace after calculations

- In the **Setup Test Prompts- Before Start** screen, check the **Show all parameters** box (if it is not already checked) and add the following to the **Selected** list:

    Geometry

    Select a default geometry, either in the **Setup Test Prompts - Before Start** screen or in the **Specimen Dimensions** screen. Let's assume that you set the default geometry to rectangular.

- In the **Setup Test Prompts- Before Specimen** screen add the following to the **Selected** list:

    Width
    Thickness
    Length
    Diameter

    and enter default values for all of these parameters as desired, either in the **Setup Test Prompts- Before Specimen** screen or in the **Specimen Dimensions** screen. Let's assume that you set the default width to 12mm, thickness to 5mm, length to 100mm and diameter to 15mm.

- In the **Setup Test Prompts - Before Test** screen, enter any text that you want to prompt the operator.

Full details of how to add and set up these screens are in the topics describing each screen.

How the test runs

1. The **Before Start** screen in the prompt workspace contains:
   Geometry – set to Rectangular.

2. The next step depends on what the operator sets the **Geometry** field to:

   If the operator does not change the **Geometry**, then clicks the **Next** button, the **Before Specimen** screen contains:

   Width – set to 12mm
   Thickness – set to 5mm
   Length – set to 100mm

   However, if the operator changes the **Geometry** to Circular, then clicks the **Next** button, the **Before Specimen** screen contains:

   Diameter – set to 15mm
   Length – set to 100mm

3. The operator enters the dimensions and clicks the **Next** button.

4. The **Before Test** screen displays. The operator installs the specimen and clicks the **Start Test** button.

5. The test sequence pauses to show the test workspace (**Show workspace after calculations** checkbox). This lets the operator view the results for the specimen that has just been tested.

6. The operator clicks the **Next** button.

7. The **Before Specimen** screen for Specimen 2 displays prompting for **Width**, **Thickness** and **Length**, if **Geometry** was left at Rectangular, or it will prompt for **Diameter** and **Length**, if Geometry was changed to Circular.

8. The sequence continues for each specimen until all specimens have been tested. When the last specimen has been tested, the software moves on to prompt the operator that the value entered for **Number of specimens in sample** has been reached. The operator can choose to finish at this point or continue testing.

9. Assuming that the operator chooses to finish, the test data file is saved and the test sequence ends.

Prompted test icon bar

The icon bar that appears at the top of the prompted workspace tells you the following:

- which steps have been included in the test sequence by the designer.

- where you are in the test sequence. The highlighted icon indicates your position in the sequence.

The icons represent the following, using the **Before Start** icon as an example:

 The **Before Start** step has been added to the sequence.

 The **Before Start** step has been added to the sequence and is the current screen.

 The **Before Start** step has not been added to the sequence.

When the **Before Start** step has been added to the sequence, the icon displays and the arrow indicating the sequence direction runs behind it.

When the **Before Start** step is the current screen, the icon changes to blue.

When the **Before Start** step has not been added to the sequence, the icon appears grayed and the arrow indicating the sequence direction runs over it.

Similarly for the remaining icons:

Before Specimen

Before Test

When the **Before Test** step is the current screen, the icon changes to red.

Before Calculations

After Specimen

At Finish

Save the test data in a sample file
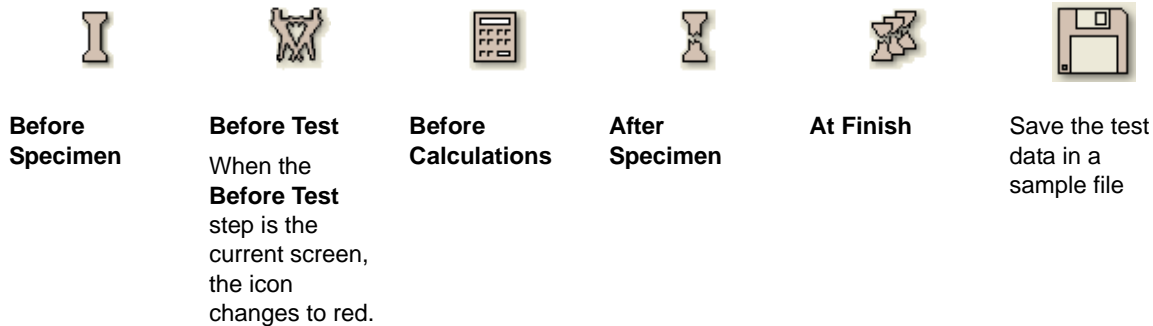
Setup Test Prompts - Advanced features

The prompted test advanced features described in the following sections are available when you are setting up a prompted test from the **Method** tab.

Show All Parameters

This box is normally unchecked and the **Available** list contains only those parameters that are appropriate for your chosen specimen geometry, test fixtures, test type and control options. If you check this box, all parameters are shown in the list, even though they may not be appropriate for the current test setup. Such parameters are shown in italics. You can add any of these parameters to the **Selected** list.

Italicized parameters will only show up in the screen if they are appropriate for the current test. Refer to "Setup a prompted test - Examples" on page 9-5 for an example of how you might use this control to create more flexible test methods.

The **Show all parameters** checkbox is a global setting and is applied to all the lists of parameters and channels in all screens.

Setting up parameter properties

Under normal circumstances, the parameters that you choose for the **Selected** list in any of the **Test Prompts** screens are already set up with prompts, default values, decimal places and any bounds. For example, you would normally set up **Width** in the **Specimen Dimensions** screen by clicking on the ⋯ button adjacent to the **Width** field.

If you want to change any of these associated parameters for one of the items in the **Selected** list, or just want to check the values without having to go back to another screen, you can do so from this screen.

1. Double-click on an item in the **Selected** list. The **Properties** dialog for that item displays.

2. The **Properties** dialog provides fields where you can change the **Prompt**, the **Default value**, the **Units**, and the number of **Decimal places** for the item. You can also set upper and lower bounds for the item.

Be aware that making changes in the **Properties** dialog in this screen changes those same items when they appear in other screens within the **Method** tab. For example, there are several locations where you can view and change the **Properties** associated with **Width**, these are:

- the **Specimen Dimensions** screen

- the **Setup Test Prompts - Before Start, - Before Specimen, - Test Workspace** and **- Before Calculations** screens

In each location, you are operating on the same default parameter and whatever you change in one location is changed in all locations.

Setting parameters to View Only

If you want to let the operator see the value of a parameter in a particular screen, but not change it, you can set that parameter to view only. For example, you might want to let the operator enter a specimen dimension before the test, but only be able to view that value after the test is run.

Appendix A
Glossary

A

absolute peak:
Typically, the highest value reached by the assigned channel during a test. For example, if load is assigned to the absolute peak calculation, then the highest value of load reached during a test is the absolute peak load. You can monitor for either a maximum peak, which occurs where the channel values decrease from a previous high value, or a minimum peak, where the channel values increase from a previous low value.

actuator:
A rod, mounted on the load frame that is driven up or down using servohydraulic force. The force required to drive the actuator is transferred to the specimen through the grips. Actuator applies to servohydraulic systems only. Note that the crosshead is fixed during a test on a servohydraulic system.

analog meters:
Show an analog representation of their associated parameters on the live display area of console. You can set the scale of each analog meter to increase the resolution of the parameter level.

anvil height:
The distance between the upper and lower components of a compression fixture.

ASCII raw data:
A file, saved at the end of the sample, of the measured data points relevant to each specimen. The data is in the standard ASCII text format, which means that you can open the file into a text editor or spreadsheet and read, print, or further analyze the details of the data. The ASCII raw data file name is of the form filename.raw.

ASCII results data:
A file, saved at the end of the sample, of the results data calculated for each specimen using the calculations that you have currently set up in the Results Table. The data is in the standard ASCII text format, which means that you can open the file into a text editor or spreadsheet and read, print, or further analyze the details of the result data. The ASCII results data file name is of the form filename.rlt.

average value:
Group of calculations that test properties such as adhesion, fabric and paper tear resistance, and surface friction. Calculations available are average peaks, average troughs, average peaks and troughs, first peak, and interval peaks.

axial strain:
Strain measured in a direction parallel to the applied load.

B

balance:
Balance resets the current transducer value of load or strain to zero by removing offsets due to minor electrical or mechanical changes. For example, the change in weight of a new upper grip can cause slight changes in the load signal. The load balance procedure resets the load signal to zero.

binary raw data:
A file, saved at the end of the sample, of the basic data relevant to each specimen. The data is in binary format, which means that you cannot open the file into a text editor or spreadsheet and read or print the details of the data.

bounds:
The term "bounds" is used to describe limits that you set for a particular parameter. These bounds must lie within system limits set by the software. For example, you know that the width of all the specimens in a particular sample should be between 10 and 15mm. If you set bounds for width of 10 and 15 and an operator accidentally enters 100mm, an error message is generated. If bounds were not set, no error would result because 100mm is a valid value for the testing system.

C

calculation:
A computation carried out on the test data. Calculations are used to find points in the test data from which you can take results. For example, you can perform a peak calculation to find the maximum load during a test. You can then obtain various results from that point, such as load, strain, or time.

calibration:
Calibration ensures that the transducer is sending the correct output voltage signals throughout its range of measurement. For example, a calibrated 100 kN load cell has an output signal of 10 V at a load of 100 kN, - 10 V at a load of - 100 kN, and 0 V at a load of 0 kN.

channel:
A source of test data. Typical channels of information are measurements of physical properties such as load, strain, and temperature. Channels may be real, derived, or composite.

compliance:
The ability of an object to yield elastically when a force is applied.

composite channel:
A composite channel is a test data channel that can change its information source during a test. For example, the composite channel Tensile Strain lets you measure strain directly from an extensometer during the first part of a test, then calculate strain from the extension of the crosshead for the remainder of the test. Thus the total strain measurement is a composite of the real strain channel and the derived strain from extension channel.

console:	The top region of the software display that lets you setup and monitor a test. The console comprises the hardware icons and the live displays.
context menu:	Also known as the right-click menu. Right-click on the screen to show the context menu for that screen component, if there is one available.
control loop:	The testing machine operates on a closed-loop control system. In extension control, the Master Controller board generates a command signal which dictates a required position for the crosshead. An encoder in the load frame has an associated feedback signal that details the current position of the crosshead. If the required position and the actual position are not equal, the system generates an error signal that drives the motor in the direction necessary to reduce the error signal to zero.
control mode:	The transducer feedback signal that controls the system. The normal mode of control is extension. Under extension control, the system requests a specific extension of the crosshead. If the current extension is different to that requested, the system generates an error signal to drive the crosshead in the direction necessary to achieve the requested extension. With the optional Enhanced Test Control module, you can specify other modes of control such as load, strain or true strain.
control panel:	On some load frames, the control panel contains dedicated keys to control the most repeated test actions and those actions that take place close to the test area. The keys let you (1) start and stop a test, (2) manually move the crosshead between tests at a selectable speed using jog keys, (3) use preassigned soft-keys on the control panel to carry out actions between or during tests, (4) select the Specimen Protect function, (5) reset the gauge length.
controller:	The controller is the hardware that controls the frame and any ancillary equipment connected to the testing system. Different controllers have different testing capabilities. Examples are the 5900, 5500, 5500A, 3300, 4400, 5800, 8800 and IS02 controllers.
creep:	Deformation that occurs over time when a material is subjected to constant stress at a constant temperature.
crosshead:	A stiff beam, mounted on the load frame, that is driven up or down using electromechanical force. The force required to drive the crosshead is transferred to the specimen through the grips. Crosshead applies to electromechanical systems only.

D

data point:

A result that is available for any calculation that identifies a single point on the test curve (e.g. peak, break, yield). This result reports the index number of the calculated point in the array of logged data. For interpolated points, where the system uses two points to perform the interpolation, the result reports the index number for the first point.

default specimen:

Values of parameters for the default specimen are the values that are saved in a test method file. Take width and thickness as examples. When you start testing real specimens in a sample, they are assigned the default values of width and thickness. In the Test Inputs area on the test workspace, you can then enter different values of width and thickness for each specimen.

delete a specimen:

When you delete a specimen, the specimen is permanently destroyed. All the data from that specimen is removed from the sample data file. This is very different from excluding a specimen, where the specimen data is retained but is not included in statistics calculations. The ability to delete specimens can be permitted or denied to an operator using security settings.

demonstration mode:

Demonstration mode is distinguished from standalone mode by the ability to run tests. Standalone mode lets you do everything except run tests on specimens. Demonstration mode uses test data to simulate running tests on specimens. It is primarily a tool for sales personnel.

dependent calculation:

A calculation carried out on the test data that is dependent upon the completion of a previous calculation. For example, an offset yield calculation may be dependent upon results obtained from a prior modulus calculation.

derived channel:

A derived channel is a test data channel calculated using data from the transducers that monitor the specimen. For example, stress is derived using load data from the load cell, average strain is derived by dividing the sum of two strain channels. Some derived channels are specific to the test type. For example, flexure stress is derived from load divided by an outer fiber stress factor.

displacement

Displacement (Strain 1 or Strain 2) is a derived channel, calculated by taking the value of the real strain channel and multiplying it by the gauge length of the device.

double shear round:

When this geometry is selected, specimen diameter is required. The specimen cross section is calculated as the area of two circles. This affects all computations based on area, including stress (and stress control rates if entered prior to test start).

E

elongation: Increase in the original gauge length at the end of the test.

energy   A measurement of the work done on a specimen during a test. The energy expended between any two points in a test is measured as the area under the load - extension curve between those points. Note that extension is calculated from the axial strain source.

In a Peel, Tear, Friction test method, the energy expended between any two points is measured as the area under the load - peel extension curve between those points.

engineering strain: The change in specimen length divided by the original length. Refer to the definition for strain.

engineering stress: Load applied to a specimen in a tension or compression test divided by the cross-sectional area of the specimen. The change in cross-sectional area that occurs with increases and decreases in applied load, is disregarded in computing engineering stress. Refer to the definition for stress.

enhanced test control module: Allows you to specify various system channels, such as Load or Strain to control the crosshead/actuator's movement. During a test, the system uses a real channel transducer to control the crosshead's movement.

exclude a specimen: When you exclude a specimen, the data from that specimen is excluded from statistics calculations. The data is not destroyed and the specimen can be included again at any time, even after the sample is finished.

extension: The location of the crosshead/actuator relative to the point where the gauge length is reset. Extension is a real channel on an electromechanical system. Extension is derived from position on servohydraulic systems.

extension (calculated rate):   **Metals test type only**

When you select **Extension (calculated rate)** as a control mode, the system calculates an extension rate at the end of the preceding ramp so that there is no speed change after the ramp change. While the test is running, the system switches to extension control and maintains the speed at the calculated extension rate for the duration of the ramp.

extensometer: A transducer that converts a value of displacement into a proportional electrical signal. There are two main types of extensometer; contacting, such as the strain gauge and automatic extensometers, and non-contacting, such as the video extensometer.

F

freeform test: If a test method is not set up to run as a prompted test, it runs as a freeform test. There are no prompts for the operator to enter values and the entire test workspace is visible to the operator at all times during testing, allowing entry of values at any time and in any sequence.

full-scale: The maximum capacity of a load cell or extension of an extensometer.

G

gauge length: The distance along the specimen upon which extension calculations are made. The gauge length is sometimes taken as the distance between the grips.

gauge width: The separation of the transverse extensometer knife edges at the start of a test.

H

hold: A test segment that holds the crosshead at the current value of the selected channel. Thus, when the Start of Hold criteria are met with load as the hold channel, the crosshead maintains the specimen at the current load value.

hysteresis loop: The closed curve representing the successive stress-strain status of the material during a cyclic deformation.

I

include a specimen: This is the reverse of exclude a specimen.

J

jog controls: Buttons and a thumbwheel on the control panel that move the crosshead up or down manually. You use the jog keys and thumbwheel to manually position the crosshead; for example, when you install a specimen.

L

limits:	The selected boundaries to which the system can drive the crosshead. You can set physical limit stops on the load frame to limit crosshead travel, and you can set electrical limits in the software for each transducer. Limits are set as safety measures to prevent overtravel or overloading.
linear interpolation:	Method of estimating a value that falls between two data points by extending a straight line between those points.
live displays:	The numeric displays in the console show current values for the selected channel in the selected units.
load:	The force the testing system exerts on the specimen. Load is a real channel. The testing system uses a load cell to measure force.
load cell:	A transducer which converts a value of force into a proportional electrical signal.
load frame:	A high stiffness support structure against which the test forces can react. The load frame comprises a base beam, two columns, and a moving crosshead.
load string:	The complete test setup between the moving crosshead and the load frame table (or fixed crosshead). The load string normally comprises a load cell, grip adapters, grips, and the specimen.
loop shaping:	Loop-shaping is the process of tuning the control loop such that the movement of the crosshead closely follows the requirements of the command signal without any significant lag or overshoot.

M

method:	The set of values of all the parameters in the system that are saved to define a test setup.
modulus:	Rate of change of stress as a function of strain. Usually the slope of the straight-line portion of a stress/strain curve.

N

nominal modulus:	A Nominal modulus value is required only when you select Stressing Rate as a control mode in a Metals test. The nominal modulus is your estimate of the modulus value of the material that you are testing. It is used in conjunction with the specified stressing rate to calculate the speed at which the test runs.

O

offset yield:

Calculation of the point on the stress/strain curve at which yield is assumed to have taken place. Offset yield is a dependent calculation that requires the result from a modulus calculation. The offset yield calculation constructs a line parallel to the modulus and separated from it by an amount that you specify. The offset yield point is where the new line intersects the curve.

outer fiber strain factor:

For rectangular specimens in a 4-point bend test:

Outer fiber strain factor = (support span^2 * (3 - (1 - load span/support span)^2))/(thickness * 12)

For rectangular specimens in a 3-point bend test:

Outer fiber strain factor = support span^2/(thickness * 6)

For cylindrical specimens in a 4-point bend test:

Outer fiber strain factor = (support span^2 * (3 - (1 - load span/support span)^2))/(diameter * 12)

For cylindrical specimens in a 3-point bend test:

Outer fiber strain factor = support span^2/(diameter * 6)

outer fiber stress factor:

For rectangular specimens in a 4-point bend test:

Outer fiber stress factor = (width * thickness^2)/(1.5 *(1 - load span/support span) * (support span))

For rectangular specimens in a 3-point bend test:

Outer fiber stress factor = (width * thickness^2)/(1.5 *(support span))

For cylindrical specimens in a 4-point bend test:

Outer fiber stress factor = (π * diameter^3)/(8 *(1 - load span/support span) * (support span))

For cylindrical specimens in a 3-point bend test:

Outer fiber stress factor = (π * diameter^3)/(8 *(support span))

P

parallel length: Parallel portion of the reduced section of the test piece or specimen.

parent calculation: A calculation that is required by another, dependent calculation. The dependent calculation requires the result of its parent calculation in order to calculate its own result. For example, an offset yield calculation may be dependent upon results obtained from a prior modulus calculation, which is the parent.

peel extension: Peel extension is a derived channel calculated as extension divided by a peel factor. The value of the peel factor varies according to specimen geometry. For 90 degree peel specimens and friction specimens, the peel factor is 1. For 180 degree peel specimens, T-peel specimens and tear specimens, the peel factor is 2.

peel factor: The value of the peel factor varies according to specimen geometry. For 90 degree peel specimens and friction specimens, the peel factor is 1. For 180 degree peel specimens, T-peel specimens and tear specimens, the peel factor is 2. This factor is used to calculation peel extension and peel length.

peel length: Peel length is the value of peel extension relative to the first peak. The first peak detector searches for a 10% drop in load from peak. The load must first attain a value of at least 1% of the full-scale of the load cell.

pip: On some load frames, you can connect an external marking device to the rear of the electrical compartment to the 1/4 in. phone jack marked PIP. When you select PIP as the source channel for a preset point result, you can display a result item in the Results column whenever you press the button on the pip marker. For example, if you set up a result of Extension at Preset Point PIP 1, the specimen extension is displayed in the Results table the first time that you press the button during a test. You can set up to 99 pip results, and capture data from all available channels on each one.

poisson's ratio: The ratio of the lateral contraction to the axial elongation.

position: Records the absolute position of the actuator. Position is a real channel. This channel is available in servohydraulic systems only.

precycling: A test segment where the crosshead moves to cycle the specimen between specified bounds before a test starts. Data is captured during the precycle segment, but is not used for subsequent analysis.

preload: A test segment where the crosshead moves to load the specimen to a specified value before a test starts. Data is not captured during the preload segment.

prompt workspace: The version of the screen within the Test tab that displays during a prompted test.

prompted test: To simplify testing, test methods can be set up to direct you through setting up and running a test. If a method is set up to run as a prompted test, the procedure constructed by the method designer automatically runs, displaying the steps and prompting you for the required inputs.

proof strength: The stress at the point of offset yield.

R

ramp: A test segment where the crosshead moves at a constant speed in a constant direction. Some test types such as tension relaxation have a single ramp segment while others such as tension have two ramp segments with a changeover point during the test.

rationalized transducer: A rationalized transducer contains code resistors which are recognized by the testing system. When you connect a rationalized transducer to the testing system, the type and the full-scale value of the transducer is registered into the system.

real channel: A real channel is a test data channel measured directly from the transducers that monitor the specimen. For example, load from the load cell, strain from the extensometer. A real channel can be a source of data for a derived channel. For example, Stress is derived from Load divided by the specimen cross-sectional area.

relaxation: The rate of reduction of stress in a material due to creep.

result: A measured value at a point in the test data found using a calculation. For example, you can perform a peak calculation to find the maximum load during a test. You can then obtain various results from that point, such as load, strain or time.

reverse polarity: When the reverse polarity checkbox is enabled, the transverse strain channel applies a factor of -1 to the source signal received.

S

sample:
A group of material specimens. whose properties are studied and compared to gain statistical or quality assurance information. For example, you could take a specimen from different parts of a single manufacturing run of a material to form a sample of the material. The sample is then representative of the complete run and you can test it to ensure that the material quality has remained stable over the complete run. You perform the same test on each specimen in a sample.

sample file:
File that contains the set of test parameters that were used to test the specimens AND all of the test data for each of the specimens. Test parameters that are the same for all specimens are stored as global parameters, test parameters that may be different for each specimen (specimen width, for example) are stored for each individual specimen.

self-identification:
A self-identifying transducer contains code resistors which are recognized by the testing system. When you connect a self-identifying transducer to the testing system, the type and the full-scale value of the transducer is registered into the system.

slack:
Typically, the distance the crosshead must travel before load is fully applied to the specimen.

soft-keys:
Buttons on the control panel to which you can assign certain test functions from the software.

specimen:
A single piece of a material for testing.

standalone mode:
When you start the software, it detects any frame that is connected to the computer. If no frame is connected, the software runs in "standalone" mode. This lets you do everything except run tests on specimens.

strain:
The change in specimen length divided by the original length. Strain is a real channel. You normally use an extensometer to measure strain, where the extensometer has a specific gauge length. The testing system uses the deflection of the extensometer divided by the gauge length to calculate the strain.

strain hardening exponent:
The slope of the log (true stress) versus log (true strain) curve in the region specified.

straining rate:

Metals test type only

Straining rate is a specified rate of strain of the parallel section of the specimen. It is run in extension control.

The specified straining rate converts into an equivalent crosshead speed by multiplying the strain rate by the gauge (parallel) length of the specimen. For example, a rate of 1% per minute on a specimen having 100mm parallel length results in a crosshead speed of 1mm/min. The Metals test type calculates an appropriate position rate that is in close proximity to the target strain rate and controls the crosshead movement at that rate throughout the ramp in which it applies. The actual strain rate that is achieved is affected by the specimen compliance.

The calculation for straining rate is:

Strain rate * Parallel length = Position rate

This calculation is only valid in the plastic region (or yielding region) of the stress-strain curve, where the majority of crosshead displacement translates into permanent specimen deformation. Because the position rate is fixed for the entire ramp and is calculated without accounting for possible compliance factors, it is not recommended for the elastic portion of the test. Since straining rate is only appropriate in the plastic region of a test, it should only be selected as the control mode in either Ramp 2 or Ramp 3.

If you use straining rate during the elastic portion of the test, it is strongly recommended that you instead use strain rate (Adaptive) with an extensometer on electromechanical systems or use strain control on servohydraulic systems.

The main advantage of the straining rate is that gain value settings are unnecessary since it is essentially in position control and it does not require an extensometer. However, if you need very accurate strain rates, you should use either Strain Rate (Adaptive) or Strain 1/Strain 2 control. Both of these control modes rely on feedback from an extensometer.

Note: Since the test is in extension control, the gauge length used to calculate the strain is the parallel length of the specimen and not the gauge length of the extensometer.

strain pacing:

Metals test type only

Strain pacing is an outer loop software algorithm that monitors the current data and alters the position rate to achieve a user defined tensile strain rate as determined from the tensile strain sensor. The pacing facility within the software allows the straining rate of the specimen to be controlled to a pre-defined level. It is intended for use with materials that show smooth, continuous deformation characteristics in the elastic region, such as metals and rigid or semi-rigid plastics. Many such materials are sensitive to the straining rate applied during the materials test and it is therefore desirable (and sometimes mandatory) to control, or at least limit, the strain rate. The actual maximum strain rate that can be controlled depends upon the characteristics of the specimen to be tested and the strain rate accuracy requirements. The lower the specimen stiffness and the more gradual the yield, the higher the strain rate that can be used.

Instron® electromechanical testing machines normally run at a constant rate of crosshead displacement (i.e. crosshead speed) by using a position controlled servo-loop. The characteristics of the testing system and specimen are such that a constant rate of crosshead displacement may not result in a constant strain at the specimen, particularly in the yielding region. Hence the need for controlling the straining rate.

In pacing mode, the software constantly alters the crosshead speed to achieve the demanded rate. The extensometer monitors the actual rate on the specimen, and the software computes the crosshead speed required to maintain the demanded rate as the test proceeds. The crosshead speed slows down as the material yields in order to maintain a constant straining rate due to the fact that most of the crosshead displacement is translated into permanent specimen deformation.

The pacing mode is intended for monotonic (unidirectional) tests only and is not suitable for controlling the straining rate during transient effects such as upper and lower yield or discontinuous yield phenomena.

strain rate (adaptive):

Metals test type only

Outer loop strain rate control while in position control. It is a strain pacing technique that remains active throughout the ramp in which it applies. An outer loop software algorithm monitors the current data stream and alters the position rate to achieve a user defined tensile strain rate as determined from the tensile strain sensor in the software.

Strain rate (Adaptive) requires an extensometer attached to the specimen throughout the ramp in which the mode is specified. In the event that the strain exceeds the maximum limit of the extensometer during the test, the mode defaults to Straining rate and uses a fixed crosshead speed.

Strain rate (Adaptive) mode of control differs from Straining rate in that the crosshead speed constantly updates to maintain the demanded strain rate. Straining rate calculates a single position rate based on the target strain rate and the gauge (parallel) length of the specimen. This rate remains constant throughout the entire ramp.

Strain rate (Adaptive) mode differs from Straining Rate in that you enter the target strain rate directly, rather than having the software calculate the target strain rate. However, the standards often require that metals testing operate within specified stress rate limits. As a result, you must manually calculate the stress rate after testing to verify that the test(s) complied with the standard requirements.

Since Strain rate (Adaptive) uses a strain pacing algorithm, it is not a true strain control mode (i.e. responding directly to feedback from the strain device) and thus you should check your data to confirm that it complies with the stress requirements of the standard to which you are testing. Determine the stress/time curve and calculate the linear portion of the curve to verify that the test(s) stayed within the stress rate requirements of the standard.

Strain Rate (Adaptive) mode is compatible with the HRD extensometer. It only applies to 5900 and 5500 Series testing machines.

Note: The HRD extensometer should not be used directly in closed loop control as it is highly unstable. If the Tensile Strain Source in Bluehill$^{®}$ is set to HRDE then inappropriate control modes are grayed out to prevent selection.

strength coefficient:

Stress-strain power curve coefficient, K, numerically equal to the extrapolated value of true stress at a true strain of 1.00.

stress:	Load divided by the specimen cross-sectional area. Stress is a derived channel. The testing system calculates stress using the measured load and the specimen dimension values that you enter.
stressing rate:	**Metals test type only**

Stressing rate is a rate specified in terms of a stress rate, but run under position control. The initial speed is calculated by dividing the value of the stressing rate by the nominal modulus of elasticity, then multiplying this quotient by the specimen gauge length.

> Initial speed = (Target Stress Rate / Nominal Modulus of Elasticity) * Specimen Gauge (Parallel) Length

Note: The Nominal Modulus for the material you are testing should be available. If you do not know the nominal modulus of the material you are testing, you should run a test on a specimen to determine a modulus.

The desired stressing rate is converted into an equivalent strain rate using the above calculation. The strain rate is controlled using the Straining Rate algorithm.

The modulus is only effective in the linear elastic region, where stress is proportional to strain. When the linear relationship between stress and strain breaks down (which occurs during yielding), this control mode is no longer capable of maintaining the desired stress rate. As a result, the stressing rate control mode should only be used in the elastic region prior to yielding, typically in Ramp 1 of the test.

If you need to maintain a constant and precise stress rate(s), you should use Tensile Stress control, which is the fully closed-loop load control version.

Since Stressing rate uses the Straining rate algorithm, it is not a true stress control mode and thus you should check your data to confirm that the data complies with the standard to which you are testing. Determine the stress/time curve and calculate the linear portion of the curve to verify that the test(s) stayed within the stress rate requirements of the standard. Although you enter the target stress rate, the actual stress rate may be incorrect if either the nominal modulus or specimen gauge (parallel) length is incorrect.

T

tensile stress then
position:

Metals test type only

When you select **Tensile Stress then Position**, the system calculates
a position rate during the test that maintains the specified tensile stress
rate. While the test is running, it converts the control mode from tensile
stress to its equivalent position rate, thus allowing the crosshead to
maintain the required speed throughout the ramp in which it applies.

If you run the test in **Tensile Stress** control mode, the crosshead may
speed up as a result of feedback received during the test. This occurs
when the specimen is no longer responding in a linear elastic fashion, as
occurs when yielding begins. The stress-strain response of the specimen
may no longer be able to maintain the rate of stress increase specified in
the method. If the crosshead speeds up, the data results may be
invalidated.

When running in **Tensile Stress** control mode, the test runs on tensile
stress feedback. When the specimen enters its yielding region, Bluehill®
adjusts the speed of the crosshead to maintain the tensile stress rate,
which forces the crosshead to increase in speed. As the specimen's yield
increases, the crosshead must continuously increase in speed. This could
lead to the frame shutting down as a safety response to a runaway
condition. The adjustment in crosshead speed violates the EN10002
standard requiring that the crosshead movement rate be as constant as
possible until the upper yield point, and can also invalidate the test data.

When you select **Tensile Stress then Position**, the test starts out
using tensile stress feedback. Once Bluehill determines that the tensile
stress rate has stabilized at the target stress rate, it calculates the
equivalent position rate and converts from tensile stress control mode to
position control mode at the calculated rate. When running in position
rate, the test continues at the calculated speed, maintaining a constant
speed regardless of changes to the specimen in the yielding region.

Maintaining a constant speed enables the Metals test type to determine
the upper yield point, and also complies with the EN10002 standard
requiring that the crosshead movement rate be as constant as possible
until the upper yield point.

There are two reasons for changing from tensile stress to position control mode:

1. It is not always possible to know what position rate will generate a desired tensile stress rate for a given material.
2. Running into yield in tensile stress control is not recommended because the crosshead will tend to speed up in order to maintain the appropriate rate.

Tensile Stress control is a valid control mode only if the transition to the next ramp will occur before yielding begins.

test data: Data points read from the testing system as each specimen is tested.

test director: Refer to the definition for a prompted test. The Prompted Test is the new version of the Test Director that existed within Merlin software.

test method: A file containing all the parameters needed by the testing system to run a test, analyze the test data and produce calculated results. It may be linked to other files; a report template to format a printed report from the testing and a test profile file, if test profiler software is being used.

test parameter: A test parameter is any value, numerical or alphabetic, that the testing software uses to run a test on a specimen and produce some kind of output. Examples are test speed, specimen geometry, and the list of results that are to be calculated. A group of test parameters can be saved as a test method.

test profile: A file containing a sequence of waveforms and ramps. You apply the test sequence to a specimen by using the optional Tension or Compression Test Profile test types.

test profiler: An optional software program for creating, editing and saving a Test Profile.

test segment: A single portion of a test, such as preload, precycle, ramp, and hold. You link individual test segments to create a complete materials test. If the system is equipped with the optional Test Profiler, you can specify the system to graph or apply calculations to segments of test data.

test type: Bluehill® software consists of a number of test types, allowing you to run different types of materials tests within the software. Examples of test types include Tension, Compression and Peel, Tear and Friction.

test workspace: The area of the screen comprising one or more runtime graphs, a result table, and an area for specimen parameters. It is the dynamic content of the screen during testing of a sample.

transducer:	A device which converts a physical property such as force, motion, temperature, and so on, into a proportional electrical signal which is used to measure the property. A load transducer, or load cell, converts load into an electrical signal, and an extensometer converts specimen extension into an electrical signal.
transverse strain:	Transverse strain is a derived channel. It is measured in a direction perpendicular to the applied load.
true strain:	Instantaneous % of change in length of a specimen in mechanical test. It is equal to the natural logarithm of the ratio of length at any instant to original length.
true stress:	Applied load divided by actual area of the cross section through which load operates. It takes into account the change in cross section that occurs with changing load.

U

undo test:	Undo Test is available when running a prompted test. It is not the same as Delete Specimen. Delete Specimen removes all the information about a specimen, including any parameters such as dimensions and specimen notes that you may have entered. Undo Test only deletes test data and calculated results, it does not delete any parameters that you may have entered in earlier prompted test screens, such as specimen dimensions.

V

VersaChannel:	Instron® name for the feature that lets you create more channels for your testing system. It requires additional hardware to let you connect extra transducers to these channels. [Previously known as Multichannel in custom versions of Merlin software].

Y

yield point extension (YPE):	In materials that have a yield point, the yield point extension is the difference between the extension (elongation) at the completion and at the start of discontinuous yielding.

I n d e x

Numerics

A

D

S

X

Y