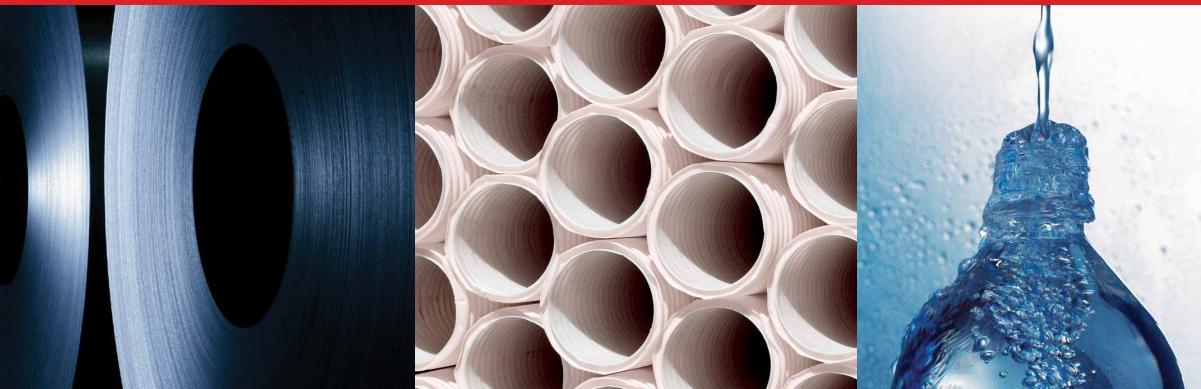


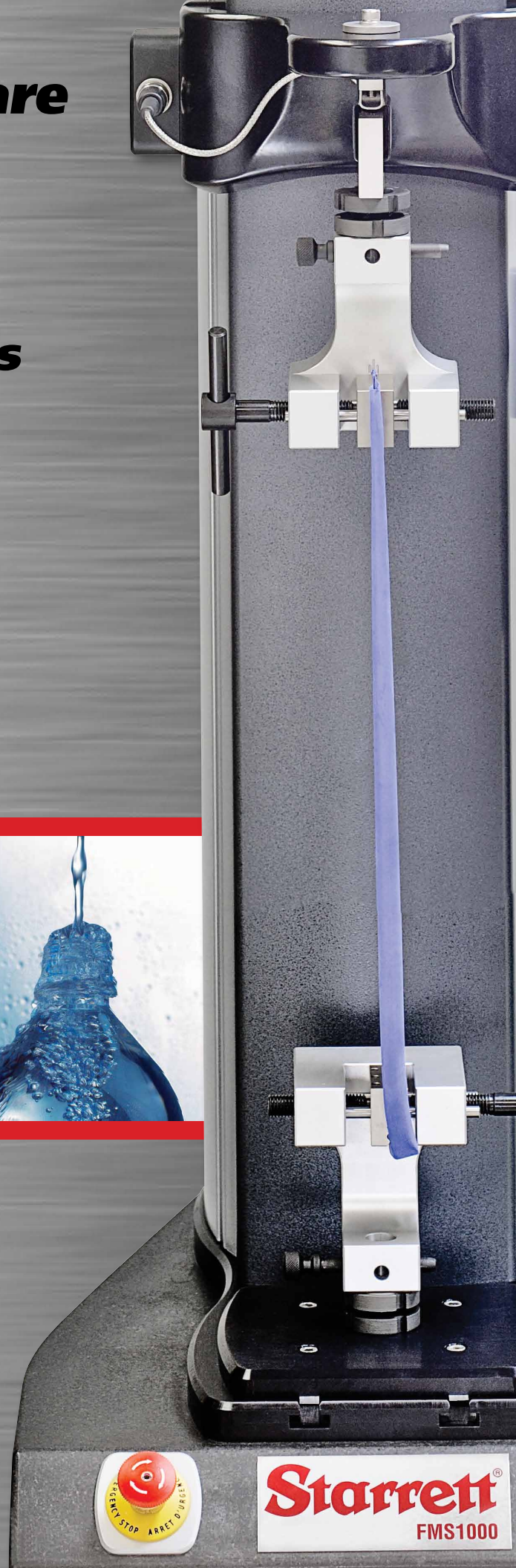
L2 Plus Series Software for Advanced Force Measurement

Operating Fundamentals



Starrett®

The Better Solution



Starrett®
FMS1000



Table of Contents		Page
2.0	L2 PLUS OPERATING FUNDAMENTALS	4
2.1	Operating Displays	4
2.1.1	Controller Window	4
2.1.1.1	Load Measurement Indicator (L)	5
2.1.1.2	Distance Measurement Indicator (D)	5
2.1.1.3	Crosshead Velocity Indicator	6
2.1.1.4	Load Cell Status Indicator	6
2.1.1.5	Limits Indicator	7
2.1.1.6	Set Home Function	7
2.1.1.7	Start/Stop Test Function	8
2.1.1.8	Return to Home Function	8
2.1.2	Results Window	9
2.1.2.1	Coefficients/Results	10
2.1.2.2	Test Status Message	11
2.1.2.3	Data Definition Menu	11
2.1.3	Header Tool Bar	17
2.1.3.1	Test Name	18
2.1.3.2	Test Name Filtering	19
2.1.3.3	Test Analysis Tools	20
2.1.3.4	Test Mode Indicator	21
2.1.3.5	Jog Speed Indicator	22
2.1.3.6	Load Cell Indicator	22
2.1.3.7	L2 Plus Main Menu	22
2.1.4	Footer Tool Bar	23
2.1.4.1	Home	24
2.1.4.2	New Test	24
2.1.4.3	Edit a Test	24
2.1.4.4	Copy a Test	25
2.1.4.5	Rename a Test	25
2.1.4.6	Delete a Test	25

Table of Contents		Page
2.1.5	Runs List	26
2.1.6	Multi-Runs	27
2.2	Full Graph Views	28
2.2.1	Load-Distance View (L x D)	28
2.2.2	Load-Time View (L x T)	28
2.2.3	Distance-Time View (D xT)	28
2.3	Data Views	29
2.3.1	Graph-Data Split View	29
2.3.2	Statistics View	30
2.3.3	Tolerance View	31
2.3.4	Extra Coefficients	32
2.4	Exporting Data	33
2.4.1	Export Raw Data	35
2.4.2	Export Results	36
2.4.3	Export to Clipboard	37
2.4.4	Export Image	37
2.5	Offline Archived Runs Analysis	37
2.5.1	Archive Runs	37
2.5.2	Importing an Archived Run	38
2.5.3	Analyzing with an Archived Run	39
2.5.4	Statistics using an Archived Run	40
2.5.5	Removing (Deleting) an Archived Run	40
2.6	Navigation Tools	41
2.6.1	Touchscreen Gestures	41
2.6.1.1	Touch Targets	42
2.6.1.2	Panning	42
2.6.1.3	Pinch Zoom	42
2.6.1.4	Window Shading	42
2.6.2	Mouse Navigation	43
2.6.2.1	Mouse Up/Down	43
2.6.2.2	Marque Selection	43
2.6.2.3	Point Zoom	43
2.6.3	Keyboard Entry	43
2.6.3.1	Text Length Rules	44

2.0 L2 Plus Series Software Operating Fundamentals

2.1 Operating Displays

Starrett L2 Plus Series software is designed to operate on an all-in-one computer workstation with touchscreen capability. The interactive functions in our L2 Plus Series software may be operated using touchscreen or using a standard mouse.



NOTE
The minimum vertical pixel resolution of the touchscreen is 1080p.

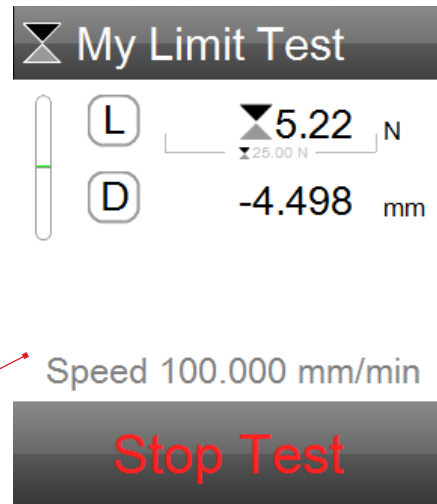
The L2 Plus display views change based on the function the user is performing. All L2 Plus display views have a common layout consisting of a Controller window, Results window, Main window, header and footer sections.

2.1.1 Controller Window

The Controller window is multi-functional. It displays the dynamic measurements of load, crosshead movement, crosshead speed velocity and displays the current measurements with respect to their target settings.

The Controller windows serves as your system’s “dashboard” supplying you with accurate measurement details of your tests and the individual measurements that comprise your test.

The individual measurements supported by the Controller window are discussed in the following paragraphs.



L2 Plus Controller Window



L2 Plus Basic Display Layout

2.1.1.1 Load Measurement Indicators (L)

There are two indicators that display the load measurement from the attached load cell sensor.

The current load measurement is displayed numerically next to the L symbol with its associated units or measure.



NOTE

Press the L symbol to zero/tare the load cell sensor.

2.1.1.2 Crosshead Distance Indicator (D)

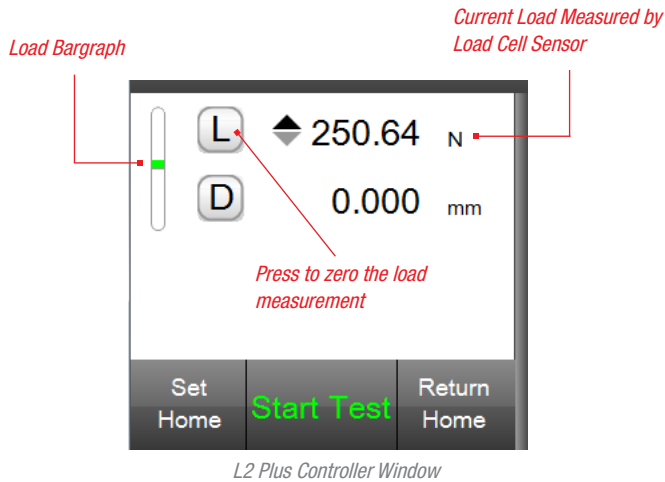
The D symbol is used to display the crosshead distance traveled. If the test system is in Height mode, the D is replaced by H to represent the height of the crosshead from the established datum.

The crosshead distance is the amount of crosshead movement from the start of the test.

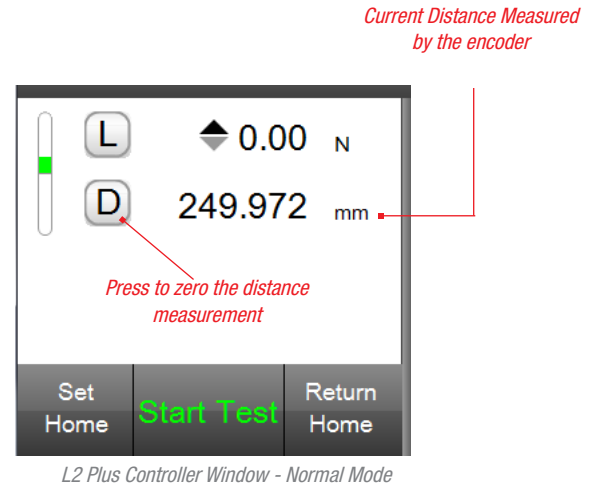


NOTE

Press the D or H symbol to zero/tare the distance or height value.



L2 Plus Controller Window

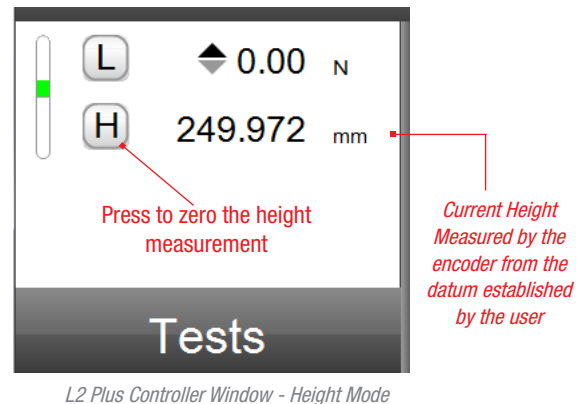


L2 Plus Controller Window - Normal Mode

Additionally, the load bargraph displays the direction of load (tensile = above the center line and compression = below the center line). The load bargraph is intended to provide the user with an indication of the load being measured versus the full scale capacity of the load cell sensor being used. Color indication is used to represent the measured load versus the load sensor's capacity as follows:

Bargraph Color	Load Indication
GREEN	The sensor is operating within its normal range 0 to 80% of full scale capacity.
YELLOW	The sensor is operating in its caution range 81 to 95% of full scale capacity.
RED	The sensor is operating in its high range 96% and above. Be alert of the measured load overloading and potentially damaging the sensor.

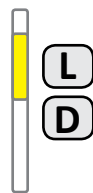
Load Sensor Status Indication



L2 Plus Controller Window - Height Mode



Load sensor operating in Normal range.
0 to 80% Full Scale



Load sensor operating in Caution range.
81 to 95% Full Scale



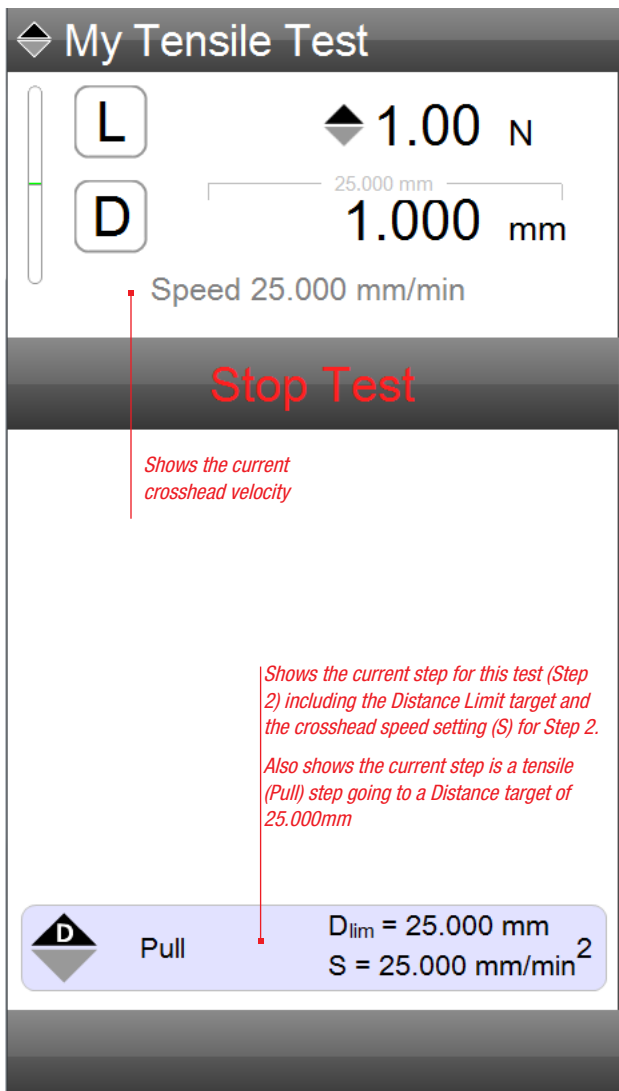
Load sensor operating in High range.
Above 95% Full Scale

2.1.1.3 Crosshead Velocity Indicator

During a test run, the crosshead velocity is indicated. Velocity is displayed for the current step being performed. Velocity may change during a test if you have specified a different crosshead velocity for a step.

When automatically returning to the Home position, the crosshead velocity is returned at the maximum crosshead speed. Maximum velocity is an option in the System Settings - Motion Setup.

Velocity is displayed with the unit of measure equal to the units of measure for the Distance (D) or Height (H) indicator.



Shows the current crosshead velocity

Shows the current step for this test (Step 2) including the Distance Limit target and the crosshead speed setting (S) for Step 2. Also shows the current step is a tensile (Pull) step going to a Distance target of 25.000mm

L2 Plus Controller Window during an active test

2.1.1.4 Load Cell Status Indicator

The Load Cell Status Indicator shows the full scale load capacity of the connected load cell sensor. The load cell symbol changes color to Yellow or Red depending on the sensor's measured load versus its full scale capacity.

Selecting the Load Cell Status Indicator displays the sensor's characteristics, including its Overload History.

All Starrett load cell sensors are compliant with IEEE 1451.4 (TEDS). These sensors are "plug & play", e.g. your Starrett system automatically recognizes the sensor and its characteristics and performance specifications.

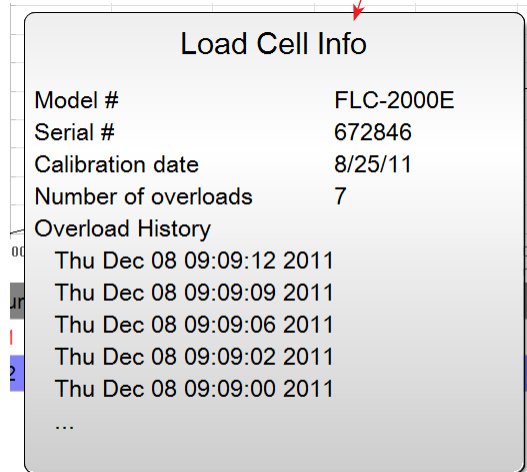
Load Cell Status Indicator - Top right on all displays



Select the Load Cell Indicator to view the attached sensor's identification and characteristics.

Overload History is displayed.

The current load cell sensor's full scale capacity is shown beneath the Load Cell Indicator symbol.



Load Cell Sensor Status View

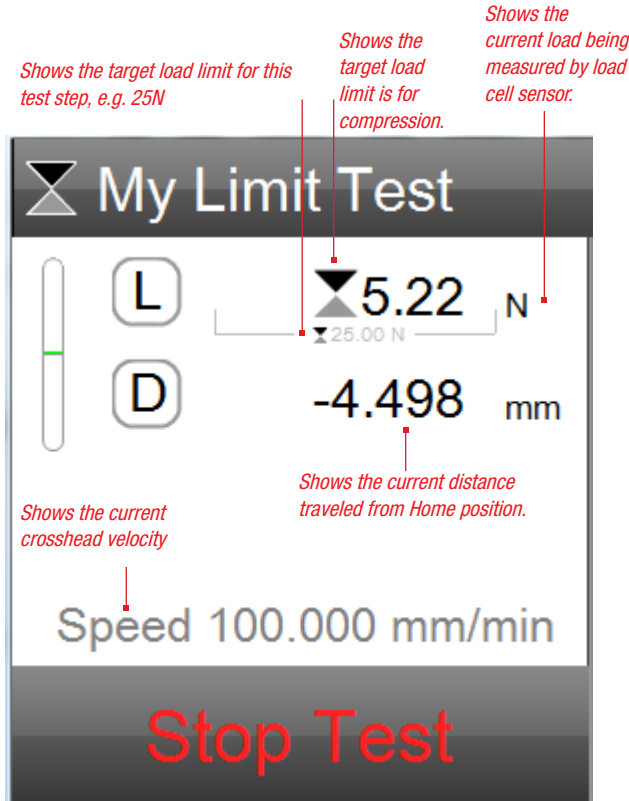


NOTE

Overloads may occur when the software is not controlling the test frame on which the load cell is installed. When this occurs, a record of the overload will display underneath the Overload History, but with a date which is not current. For example, the date stamp may have the year 1999. This means an overload occurred and was recorded by the load cell sensor, but not by the software since it was not controlling or communicating with the test frame.

2.1.1.5 Limits Indicator

During an active test run, an indicator will typically appear above or below the measured value in the Controller view. For example, if the active test step is “go to a compression load of 25N” a limit indicator will appear above the measured load value showing the target load of 25N.



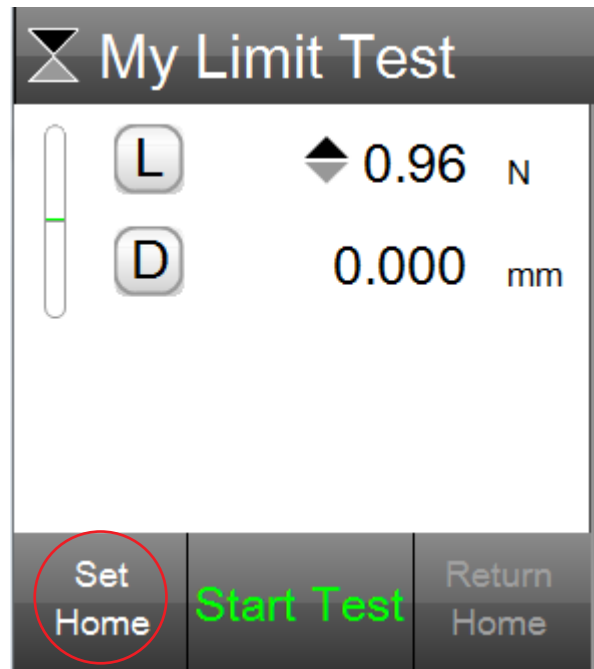
Load Limit Indicator
Displays target for active test run

2.1.1.6 SET HOME Function

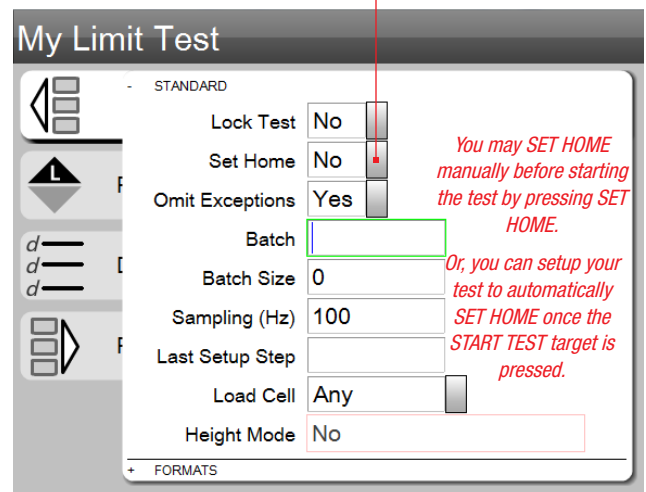
Pressing the SET HOME target automatically sets the position of the crosshead as the home position, e.g. where the test is started from.

You may press the SET HOME when manually starting a test, or you may configure your test setup to automatically SET HOME when you select the START TEST target.

Setting Home allows the crosshead to automatically return to this exact position for the next test run.



Manually Set Home
before Start Test



Pre Test Setup Menu - Set Home Option (Yes or No)

2.1.1.7 START/STOP Function

The Controller window displays the START TEST-STOP TEST function. This display target operates identically to the Start/Stop push button on your FMS or FMD Series test frame.



CAUTION

Starrett recommends that you use the Start/Stop push button to start or stop your test. This will help eliminate longer term issues on your touchscreen display where repeated touches can mar the display.

The START/STOP function can be used to Start a Test, Pause a Test, or Stop a Test. If you are using an extensometer and want to remove it from the sample prior to sample break, you press the Start/Stop push button to stop (pause) the test. You can resume, by pressing the Start/Stop push button again.

During an active test, the display will show STOP TEST. This is indication that the crosshead is active.



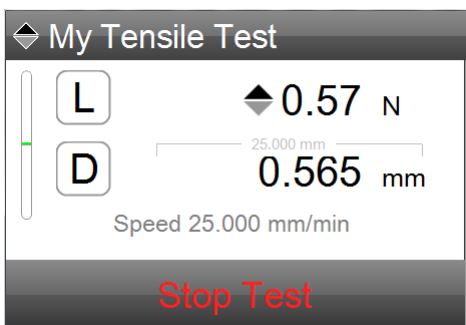
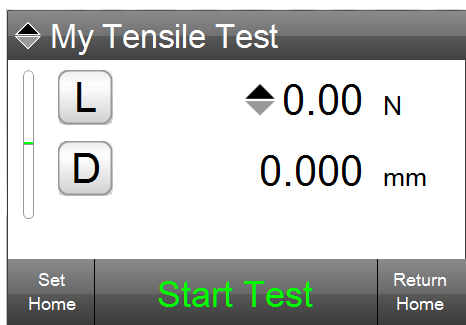
CAUTION

Tests performed at very slow speeds are difficult to distinguish whether or not a test is being performed and the crosshead is active. The crosshead is active when the STOP TEST label is displayed.



CAUTION

The Start/Stop push button features an LED indicator that shows the crosshead status. If the LED is displaying a solid GREEN, this is the same as START TEST, e.g. the crosshead is inactive and ready to test. During an active test, the LED displays a blinking RED indicating that the crosshead is active.



2.1.1.8 RETURN TO HOME Function

The RETURN TO HOME function may be used manually or automatically. The RETURN TO HOME function returns the crosshead to the SET HOME (start test) position after a test run is completed.

Once the test run is completed, you may press the RETURN TO HOME target. The crosshead will return to its start position (SET HOME). If SET HOME was not selected or configured as part of the test's Pre Test step, the RETURN TO HOME function is not available since no Home position was ever established.

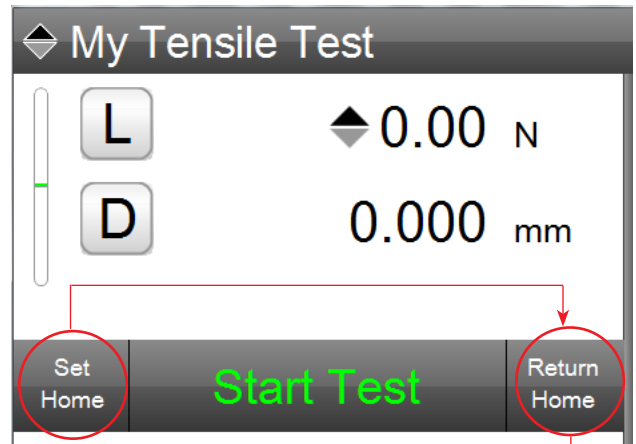


CAUTION

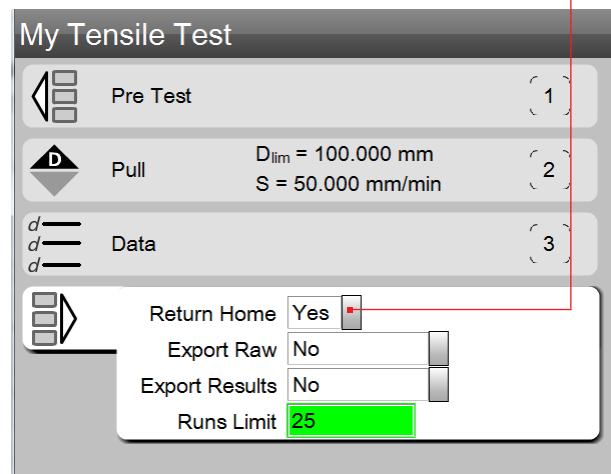
Care should be taken when using the RETURN TO HOME function for tensile tests. Prior to selecting the RETURN TO HOME function, it is recommended that the sample be removed from the test fixture.

In your test setup, you may use the Post Test step to configure your test to automatically RETURN TO HOME upon completing a test run.

Manually Set Home before Start Test



*You must SET HOME for RETURN HOME to cause the crosshead to return to the start test position.
Press RETURN HOME or use the RETURN HOME option in your Post Test step.*



2.1.2 Results Window

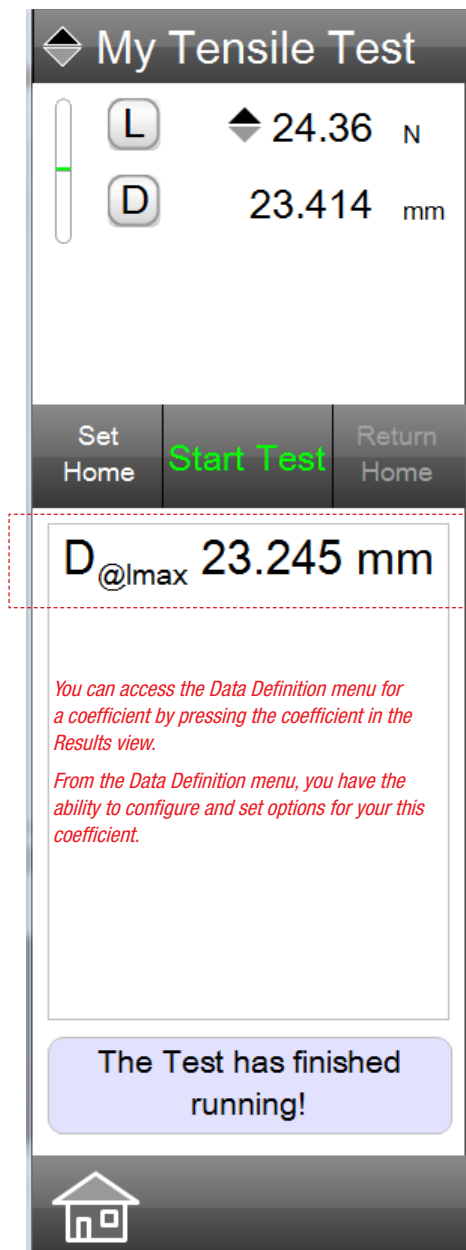
During test operation, the Results window can be used to display your most critical results. Results are also called Coefficients. Coefficients are your measured results and are presented with a label that identifies the coefficient; the measured result for the coefficient; and the unit of measure for the coefficient.

The Results window is also used to display the Data Definition Menu for a selected coefficient. The Data Definition Menu will be discussed in more detail in User Guide 5 - Analyzing Test Results.

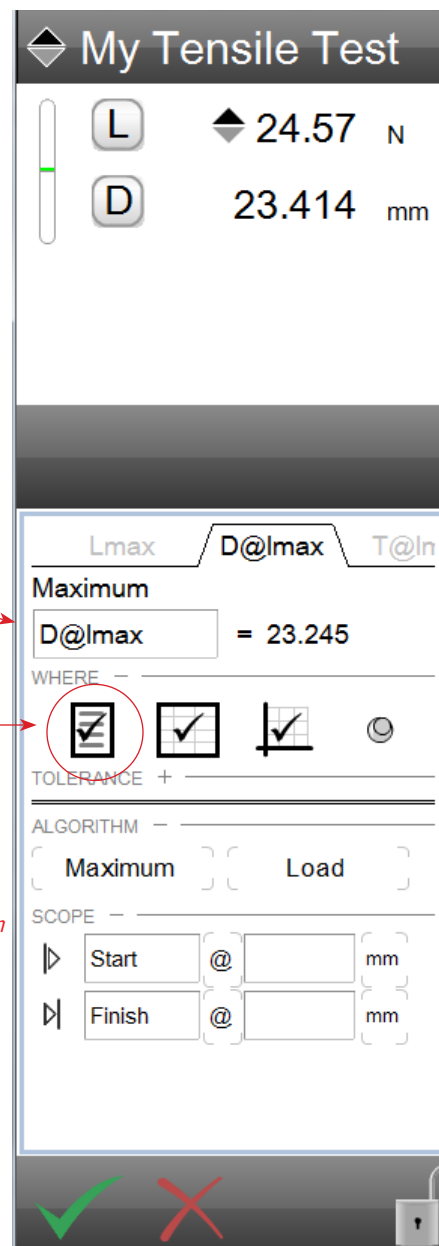


NOTE

The Data Definition Menu for a coefficient is used to determine where the coefficient gets displayed and what size the coefficient is displayed at in the Results window. This menu also allows you to rename your coefficient.



L2 Plus Results View
Shows results of selected coefficients



Use the WHERE function to designate what coefficient is displayed and "where" it gets displayed. This symbol shows to display the coefficient D@lmax on the Result view.

L2 Plus Data Definition Menu
Shows the options and functions available for the Distance @ Max Load

2.1.2.1 Coefficients/Results

Results are also called Coefficients in L2 Plus Series software. Coefficients can be requested measurements prior to the test or as measurements after the test is completed, including derived and calculated results.



NOTE

L2 Plus Series software gives you complete flexibility to get a result at any time from the acquired data for your test run. You can request a result before or after completing a test run.

Here is a list of different coefficients that you can obtain using L2 Plus Series software. Many of these are shown in the examples in **User Guide 5 - Analyzing Your Test Results**.



NOTE

L2 Plus Series software uses labels to represent coefficients. Labels may be renamed. Labels names are restricted to 8 characters.

Load Coefficients	Coefficient Label
Maximum Load	Lmax
Load at a Point	Lpt
Load at a Break (Load-based)	Lbrk
Load at a Break (%Drop from Max Load)	Lbrk
Load at a Break (Rate of Change)	Lbrk
Average Load	Lavg
Minimum Load	Lmin
Load Relaxation Rate	Lrate

L2 Plus Load Coefficients

Distance Coefficients	Coefficient Label
Maximum Distance	Dmax
Distance at Maximum Load	D@Lmax
Distance at Minimum Load	D@Lmin
Distance at a Point	Dpt
Distance at a Break (All types)	Dbrk
Average Distance	Davg
Distance Creep	Drate

L2 Plus Distance Coefficients

Slope/Rate Coefficients	Coefficient Label
Slope	λ
Tangent Slope	λ
Chord Slope (Two Point)	λ
Hysteresis	λ
Spring Constant	K
Spring Rate	Krate

L2 Plus Slope Coefficients

Examples of results when using Load/Distance modes

Work/Energy Coefficients	Coefficient Label
Work	W

L2 Plus Energy/Work Coefficients

Cyclic Coefficients	Coefficient Label
Distance at a specified Load	Dpt
Load at a specified Distance	Lpt
Load/Distance - Increasing	Lpt
Load/Distance - Decreasing	Lpt
Hysteresis	Hyst
Hysteresis Loss	Hloss
Load/Distance at a specified Elongation (Average)	Lpt

L2 Plus Coefficients commonly used with Cyclic Testing

Peel Coefficients	Coefficient Label
Load at First Peak	LPeak
Load at Last Peak	LPeak
Load at a specified Peak	LPeak
Load at First Valley	Lvalley
Load at Last Valley	Lvalley
Load at a specified Valley	LPeak
Load at Highest Peak	LPeak
Load at Lowest Valley	LPeak
Number of Peaks	Lcnt
Number of Valleys	Lcnt
Average All Peaks	Lavg
Average of selected Peaks	Lavg
Average All Valleys	Lavg
Average of selected Valleys	Lavg

L2 Plus Coefficients commonly used with Peel Testing

2.1.2.2 Test Status Messages

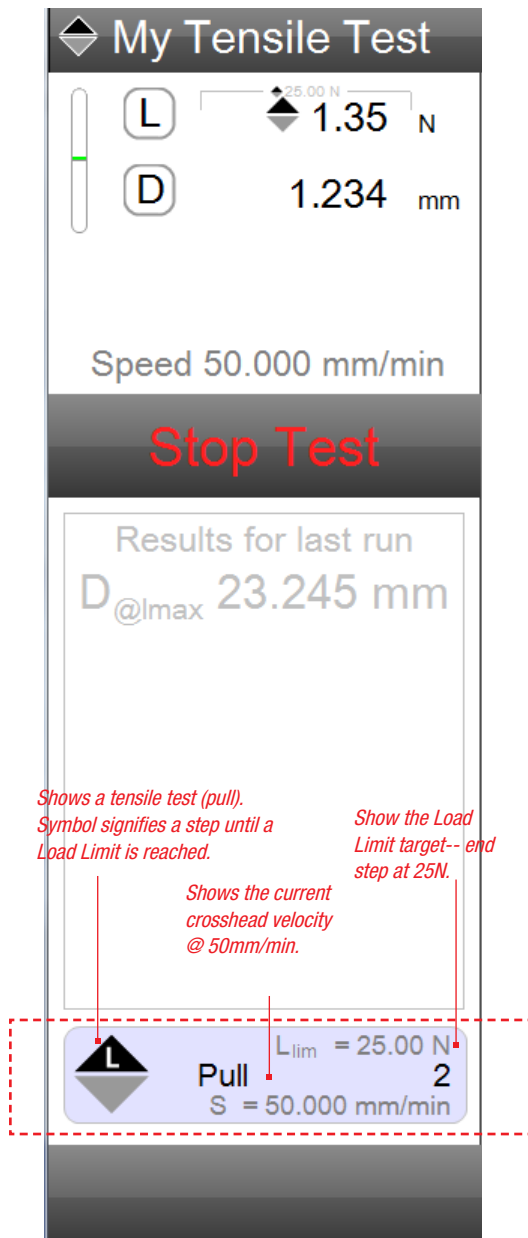
During an L2 Plus test run, the current step and key attributes of that step are displayed in the test status message box. When the test is completed, the test status message box displays Completed Test.

The test status message box is only active during a test.

2.1.2.3 Data Definition Menus

Every coefficient has an associated Data Definition menu. This menu is used to configure the coefficient. Configuration options include:

- Coefficient Name
- Where to Display Coefficient
- Tolerance Limits Settings
- Algorithm Options
- Scope Limits

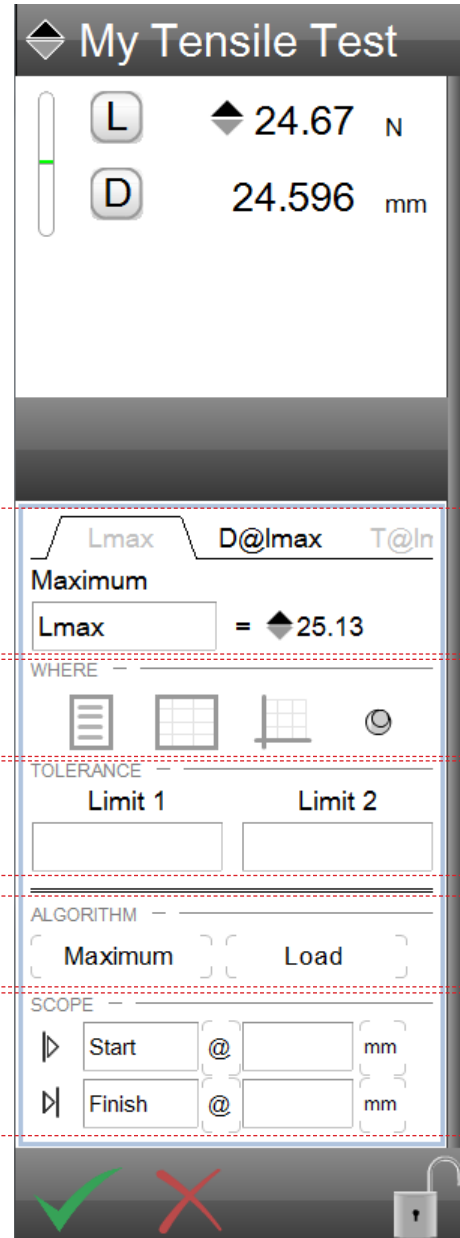


Shows a tensile test (pull).
Symbol signifies a step until a Load Limit is reached.

Show the Load Limit target-- end step at 25N.

Shows the current crosshead velocity @ 50mm/min.

L2 Plus Active Test Run
Shows Step 2 status and key attributes



Coefficient NAME

WHERE to display coefficient

Coefficient TOLERANCE limits

Coefficient measurement ALGORITHM method

Coefficient SCOPE range

L2 Plus Data Definition Menu
Shows options/attributes for a coefficient

Coefficient Name

Coefficients have default names, which are abbreviations for the coefficient. You have the option of changing the name here. The coefficient name is restricted to 8 characters.

Coefficients appear as “sets” in the Data Definition menu. For example, the coefficient for Load will also appear with the associated coefficient for Distance and Time. So, if the Point tool was used to find a particular Load on the graph, the Point tool will also find the Distance at the point as well as the Time at that point. Coefficient sets are distinguished in the Data Definition menu by individual tabs.

Changing the coefficient name in this menu only changes the name of this coefficient for this test setup. If you want to permanently change the coefficient name so it always appears with your preferred name, use the COEFFICIENT Settings function in the Main Settings section.



NOTE

Coefficient names may be up to 8 characters in length.

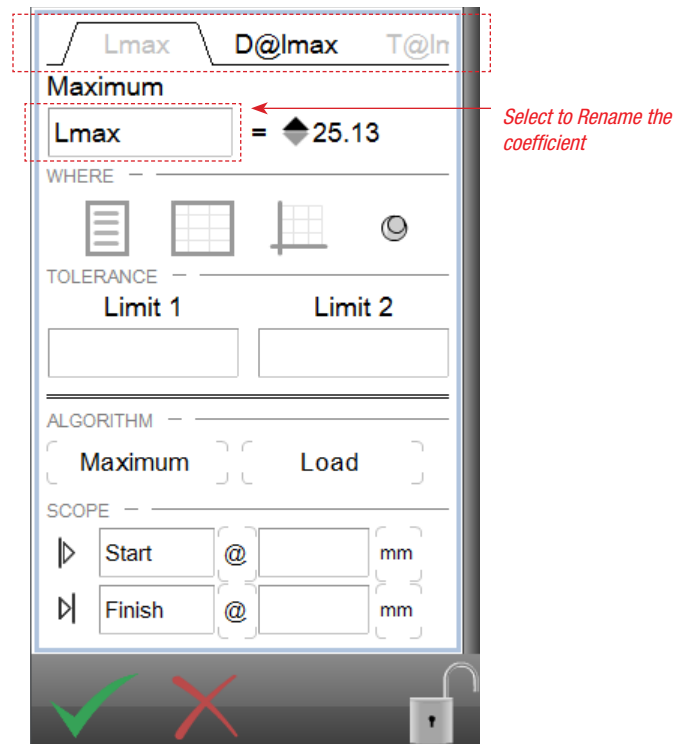


NOTE

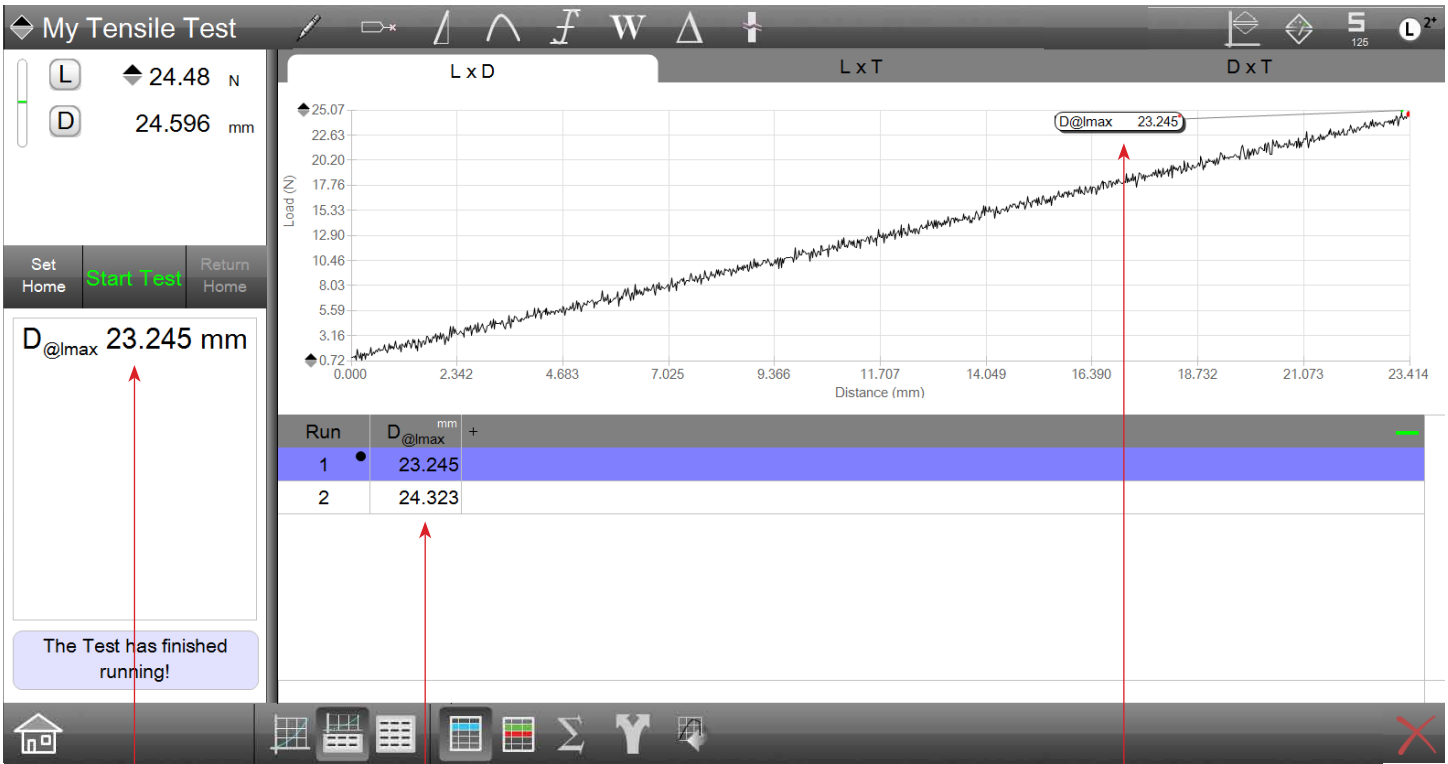
You can change the name globally using the main Settings menu. See **User Guide 7 - Security and System Settings**.

Coefficient TYPES for this measured result

The “tab” shows the “active coefficient”. Change to another coefficient by select the tab for that coefficient.



*L2 Plus Data Definition Menu
Menu using Min/Max/Avg Analysis Tool*



Display at RESULTS view.

Display at DATA views.

Display at GRAPH views.

Where to Display Coefficient

Coefficients have three options as to where it may be displayed:

- Results view
- Data view
- Graph view

You can specify WHERE to display the coefficient by selecting the symbol that represents the view: Results, Data or Graph.

The coefficient also has the option to be “pinned”. When a coefficient is pinned, the L2 Plus software automatically positioned the coefficient marker to the “best location”. When unpinned, you may move the marker to the desired location.

Select the WHERE location you want the active coefficient to display.

A checkmark appears over the display location symbol indicating that the coefficient will be displayed at this view.

L2 Plus Data Definition Menu
WHERE specifies where coefficient is displayed

Tolerance Limits

Use the tolerance limits to setup pass/fail criterion for your coefficient. When tolerance is used, the value of the coefficient must equal or full within the range you created by the Limit 1 and Limit 2 values. If the coefficient result falls outside this range, the coefficient will display in red and will be identified in the Data view as a “failed result”.

Enter your tolerance limits to define your tolerance range. Results equal to or within the tolerance range will report as “Pass” results and will display in black text.

Results that fall outside the tolerance range will report as “Fail” results and display in red text.

Lmax / D@lmax / T@ln

Maximum

D@lmax = 23.245

WHERE

TOLERANCE

Limit 1: 21.000 | Limit 2: 23.000

ALGORITHM

Maximum | Load

SCOPE

Start @ mm | Finish @ mm

*L2 Plus Tolerance Definition
Coefficient in red indicates an “out-of-tolerance” result*

My Tensile Test

L x D | L x T | D x T

Load (N) vs. Distance (mm)

D@lmax 23.245 mm

Run	Coef	Units	Actual	Limit 1	Limit 2	Deviation	P/F	Comment
1	D@lmax	mm	23.245	21.000	23.000	← →	Fail	
2	D@lmax	mm	24.323	21.000	23.000	← →	Fail	

The Test has finished running!

*L2 Plus Split Graph with Tolerance view
Tolerance limits set for Distance at Maximum Load*

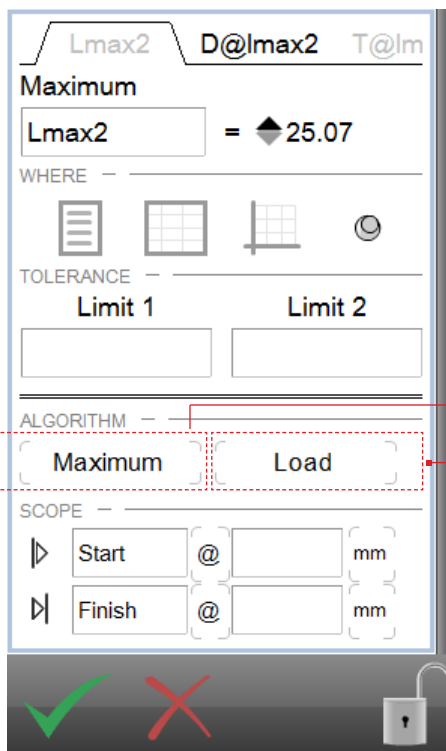
Algorithm Options

Coefficients have different algorithms or methods that you may select for your coefficient. The algorithm determines how the results are measured and calculated.

For example, selecting the Min/Max/Avg tool will provide you with different algorithms for determining the Maximum or Minimum Stress.

A single coefficient may be calculated in multiple methods/algorithms.

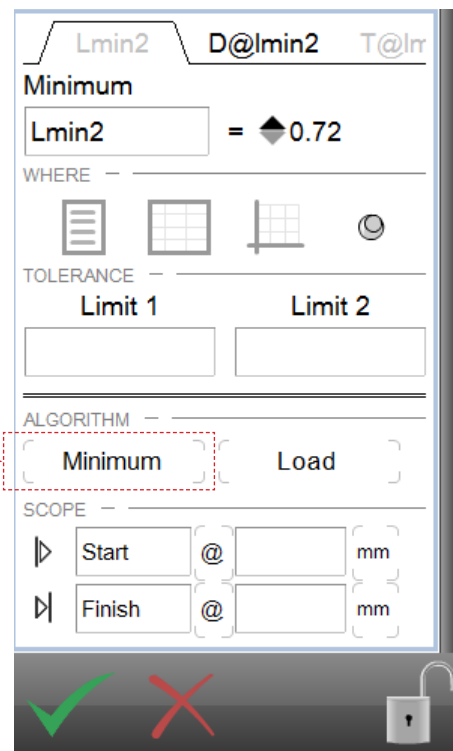
The various algorithms are discussed in detail in **User Guide 5 - Analyzing Test Results**.



L2 Plus Data Definition menu
Coefficient algorithm for this Load Point is "Maximum"

Select on the algorithm type available for the active variable. In this example, the active variable is LOAD and we switch from MAXIMUM to MINIMUM algorithm.

Select on the variable that the algorithm is being applied to. In this example, LOAD is the active variable. Selecting this target area will toggle the available variables between LOAD and DISTANCE.



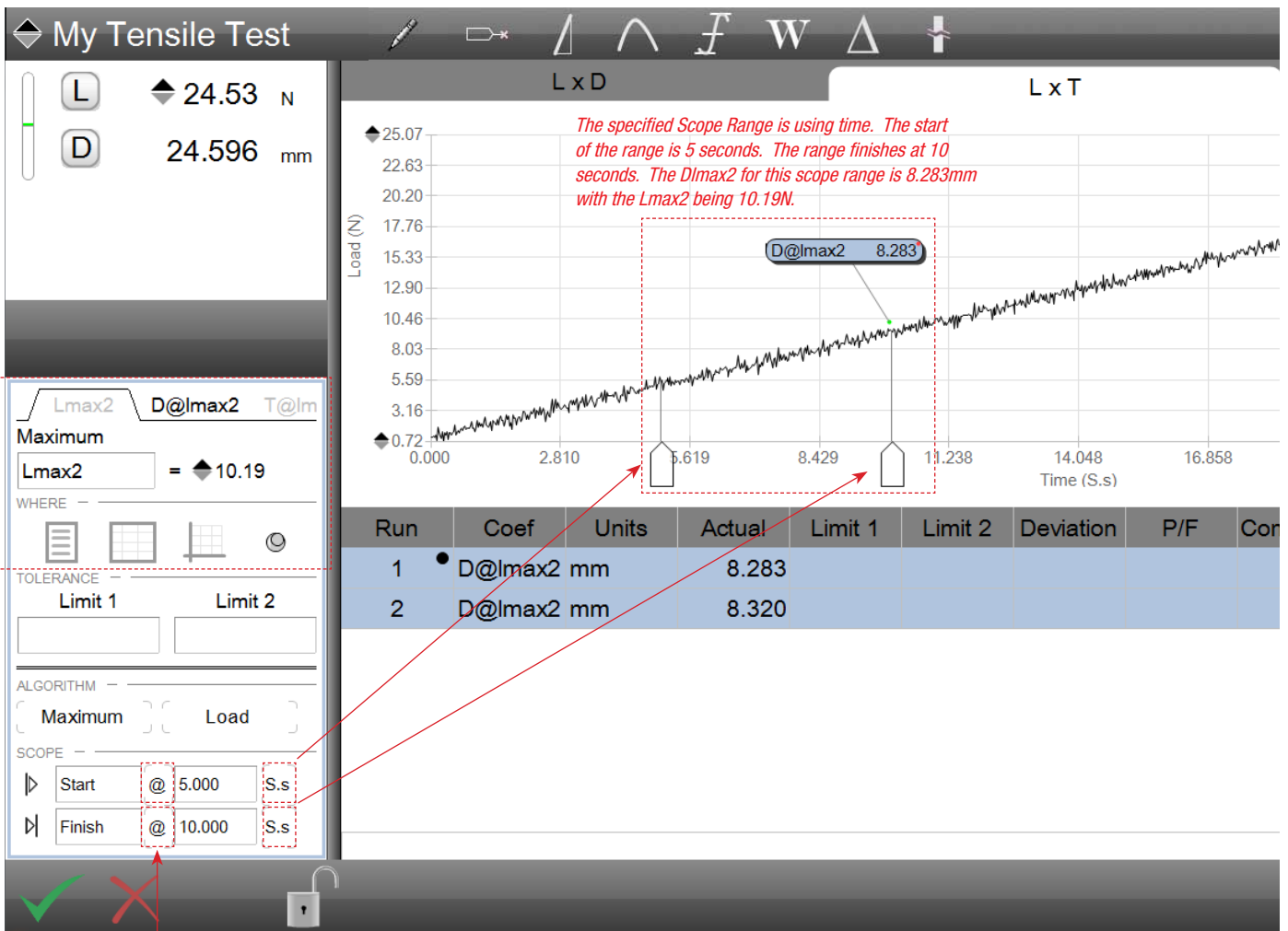
L2 Plus Data Definition menu
Coefficient algorithm for this Load Point is "Minimum"

Scope Limits

All coefficients have a scope. The scope is the region within your data collected for the test, or shown on the graph that you are interested in. For many coefficients the scope limits may be from the START to the FINISH of the test run. However, you may enter your own specified Start and Finish limits, which could be based on a step in your test setup, or a time or associated with another coefficient. Scope limits have Units of measure that may be adjusted to find a specific result. For example, you want to know the load at 100mS after the maximum load. You can specify this using the Scope Limits. The Start is Lmax and the Finish is 0.01 S.s.

Scope limits define the area/region you are interested in obtaining a result/coefficient.

Scope is discussed in detail in **User Guide 5 - Analyzing Test Results**.



The active coefficient is Lmax2. The scope range is created starting at 5 seconds and finishing at 10 seconds. Notice the graph has changed to Load x Time. The two scope handles on the x-axis can be used to adjust the scope range. Or, you can simply enter the Start and Finish values into the Scope fields. The Scope operators may be @ (at a specific location), + (at a location AFTER), or - (at a location BEFORE). The units may be time, load, distance and can be changed by pressing onto the units targets.

The active coefficient is Lmax2. Its result is 10.19N. But because the WHERE for this coefficient shows not to display on Results, Data views or Graph views it does not appear on the graph or table.

2.1.3 Header Tool Bar

The header tool bar is dynamic and depending on the function you are performing can change to include different icons of interest.

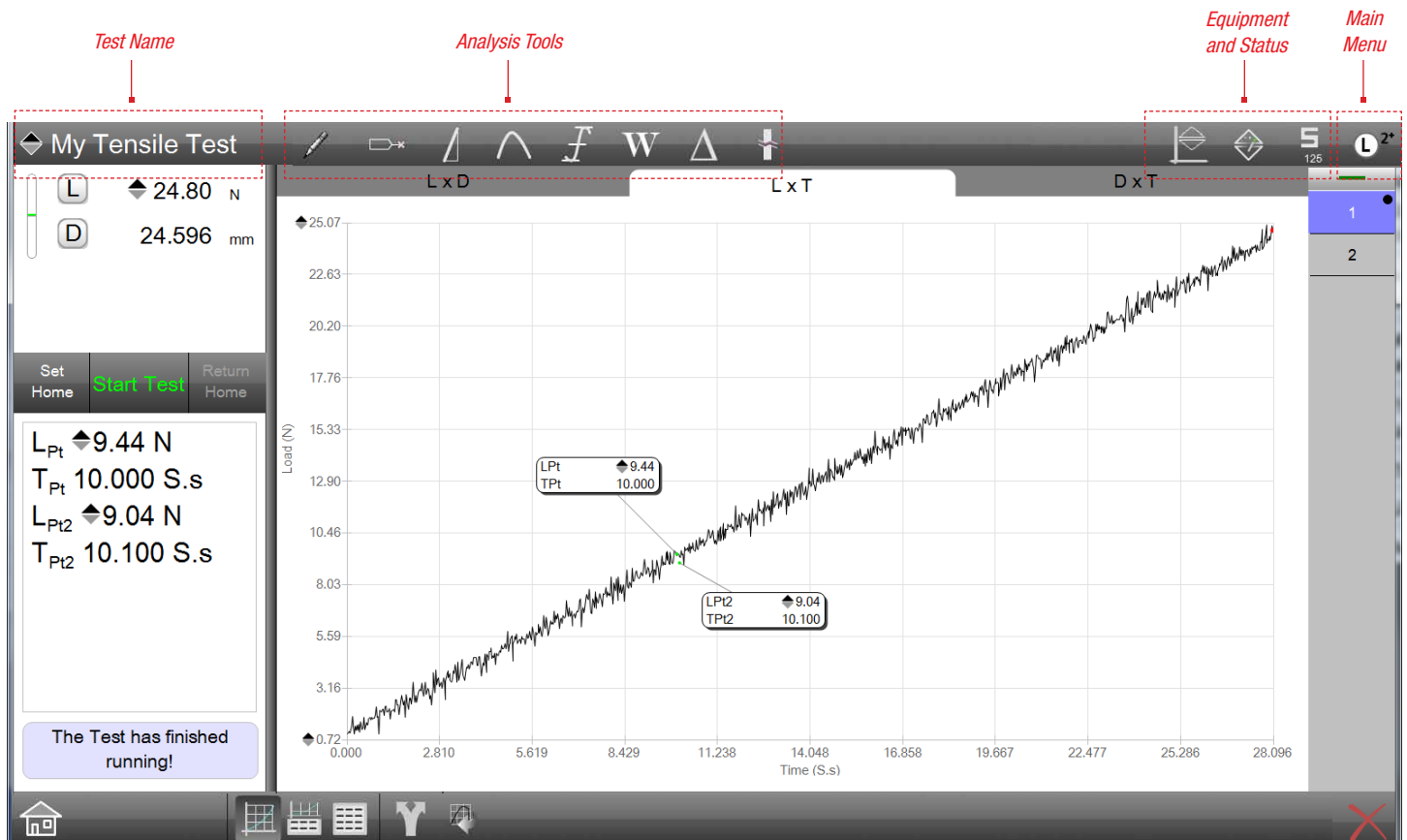
During normal operation, the header will display the following:

- Test Name
- Graphical Analysis Tools
- Equipment and Status Information
- L2 Plus Main Menu Symbol



NOTE

During the Data Definition function, the Equipment and Status Information is not displayed.



2.1.3.1 Test Name

The Test Name appears in the upper left corner of the header. The test name will also appear as a line on the Home view. Selecting the test name at the Home view will launch that test setup.

The Test Name dialog will appear once you have created a test and selected the check mark to accept.



NOTE

Your test name may be up to 24 characters in length. Test names may use alphabetical, numeric and symbol characters.



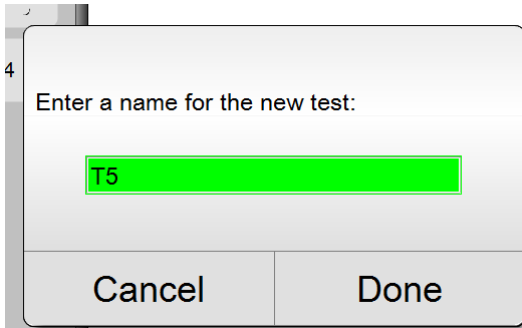
NOTE

The test name is shown in the header immediately above the Controller view. If the Controller view is narrowed, the test name may not display in its entirety. Expand the Controller view to its maximum width to view the entire test name.



NOTE

You may rename your test name using the Rename function. Select the test name from the Home view. Select the rename function, entering the new name for your test. Renaming a test may be restricted by Security settings.



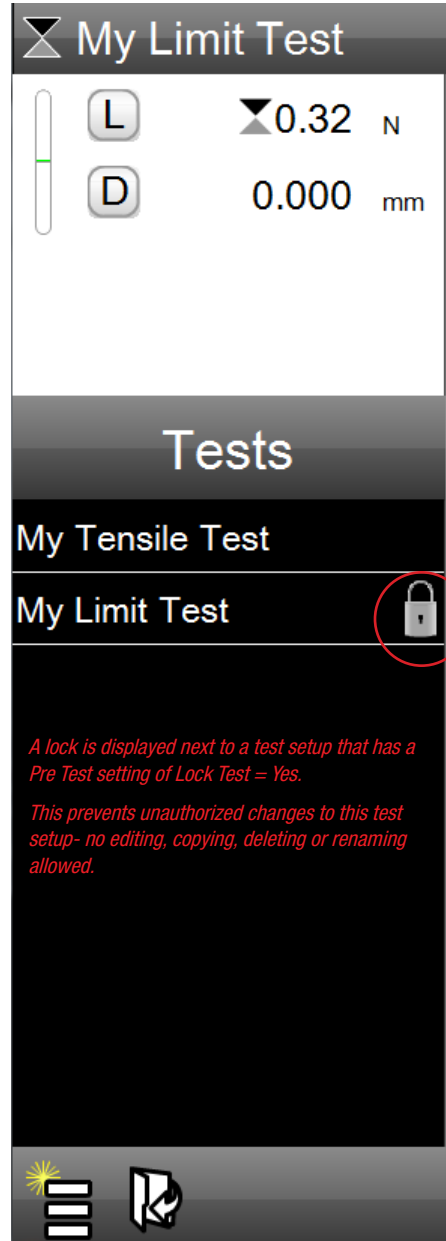
L2 Plus Test Name Dialog

Once you create a test, you are asked to name your test



NOTE

A user with appropriate Security privileges may prevent a Test Setup from being edited, copied, deleted or renamed. When a test setup is locked, a lock icon appears next to the name in the Home menu.



A lock is displayed next to a test setup that has a Pre Test setting of Lock Test = Yes.

This prevents unauthorized changes to this test setup- no editing, copying, deleting or renaming allowed.

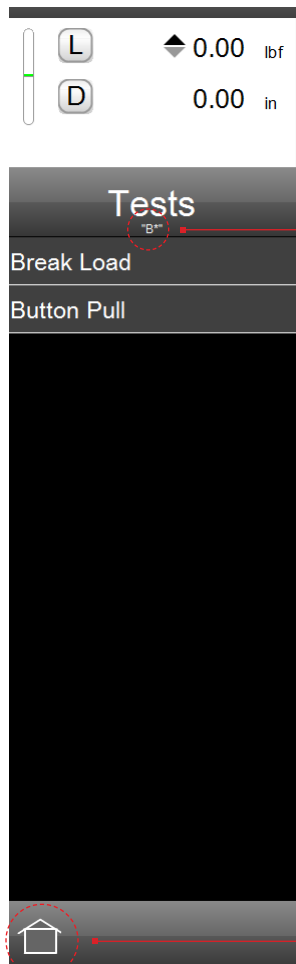
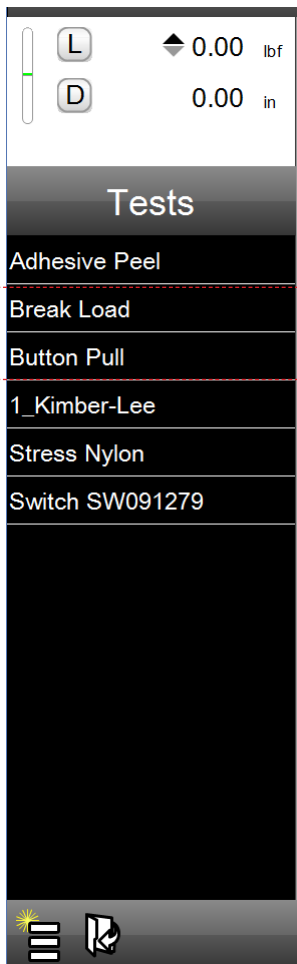
*L2 Plus Home view
Shows available Test Setups*

2.1.3.2 Test Name Filtering

When you have a large number of test setups, you may use the Test Name filtering feature to sort test setups by name.

Using your keyboard attached to your workstation, enter the first characters of the test name. The test list will be sorted and only the test setup names with those characters will display.

Select the empty Home symbol in the footer section to display the entire list of test setups again.



Typing the letter "B" using the workstation keyboard filters out the test names that begin with the letter "B".

Selecting the "empty" Home symbol returns the complete list of test setups.

*L2 Plus Home view
Shows available Test Setups*



NOTE

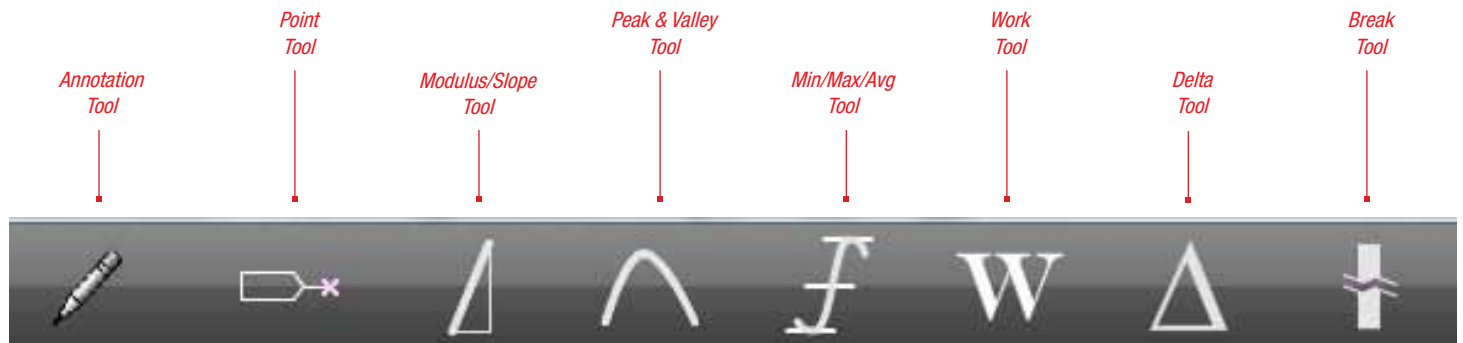
Use a QWERTY keyboard attached to your workstation to filter Test Names from your Home menu. If you have many test setups, you may filter/sort by typing the first characters of the test names in your list.

2.1.3.3 Test Analysis Tools

A set of test analysis tools appear above the main graph window. These tools are used to find or calculate results from your graph trace. There are eight (8) test analysis tool types:

- Annotation
- Point
- Modulus/Rate
- Peak/Valley
- Minimum/Maximum/Average
- Work
- Delta
- Break

These tools and their various functions are discussed in detail in **User Guide 5 - Analyzing Your Test Results**.



L2 Plus Test Analysis Tools

2.1.3.4 Test Mode Indicator

Your L2 Plus system has two test modes:

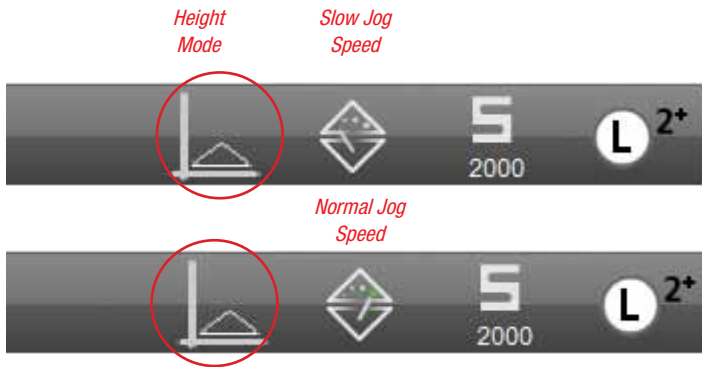
- Normal Mode
- Height Mode

When in normal operating mode, the zero or datum position is established when you specify the Home position using the SET HOME command. When in normal mode, the D symbol is used to display the distance the crosshead is from the established Home position.

When in height operating mode, the zero or datum position is established using an automatic pre-test routine. The user must first place the system in Height mode. This can be done using the Pre Test step, or by selecting the Test Mode indicator and selecting the height mode. When in height mode, the H symbol in the Controller view represents the current height from the datum position.

The Test Mode used MUST BE SET before the test setup is created.

You cannot setup a test in Normal mode and then change to Height mode.



*L2 Plus Test Height Mode Indicator
Slow and Normal Jog Speed*

2.1.3.5 Jog Speed Indicator

The jog speed indicator shows whether the jog switch is set to SLOW or HIGH speed. Select the indicator to toggle between Slow and High speed.

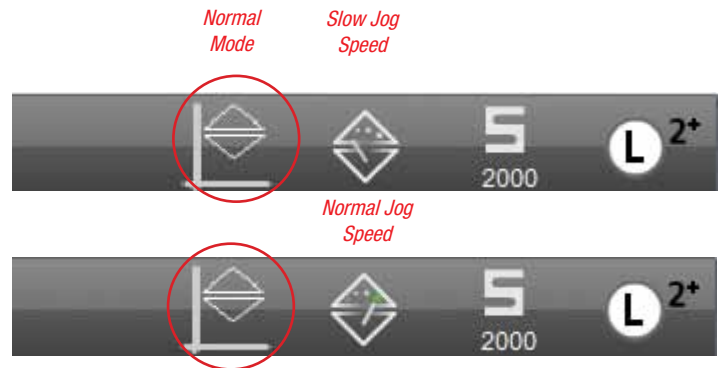
When shown in SLOW speed mode, depressing the Up/Down jog switch causes the crosshead to move at the slow velocity.

When shown in HIGH speed mode, depressing the Up/Down jog switch causes the crosshead to move at the maximum crosshead velocity you set in the SETTINGS/MOTION function. See **User Guide 7 - Security and System Settings** for details on how to set maximum velocity.



CAUTION

Do not attempt to change the speed while pressing down on the jog switch.



*L2 Plus Test Normal Mode Indicator
Slow and Normal Jog Speed*

2.1.3.6 Load Cell Indicator

The Load Cell indicator lets you know the following:

- A load cell is properly connected and communicating to your system;
- The load cell sensor’s rated capacity

If you press the load cell indicator, the load cell sensor status view will provide you with information about your sensor including the sensor’s serial number and the overload history.



Load Cell Info	
Model #	FLC-2000E
Serial #	672846
Manufacturing Cal date	8/25/11
Last Calibration date	
Number of overloads	0
Overload History	

L2 Plus Load Cell Information Indicator

2.1.3.7 L2 Plus Main Menu

The L2 Plus Main menu provides the following functions:

- Access to the main System Settings
- Ability to Print reports
- Ability to Log-In as a password protected user
- Ability to Log-Out the L2 Plus system

System Settings

System Settings are discussed in detail in **User Guide 7 Security and System Settings**. The System Settings are the primary setup functions for your system and include Security settings, the display Language setting, Desktop options, Corrections and more.

Print Reports

The L2 Plus Main menu is used to print one of the standard reports supplied in your L2 Plus System. The report type available is displayed beneath the printer icon. From a specific view, the report type associated with that view may be printed by pressing the L2 Plus Print symbol. Print types are discussed in detail in **User Guide 6 Managing Data**.

Log-In

Your L2 Plus system allows you to restrict access to the system or certain system functions using password protection. When passwords and user names are utilized, a user will be required to log-in to the L2 Plus system by accessing the L2 Plus Log-in view; entering their user name and password.

Log-Out

The L2 Plus Log-out function is used to log out of the L2 Plus system. Systems setup to utilized user names and passwords will use this function to end a session for a user.



System Settings

Page Formatting

Log In

Log Out



L2 Plus Main Setting Menu

2.1.4 Footer Tool Bar

The Footer Tool Bar extends along the bottom of the L2 Plus display views. The tool bar functions change based on the operating mode or functions being displayed.



NOTE

The footer functions change based on the display view that is active.

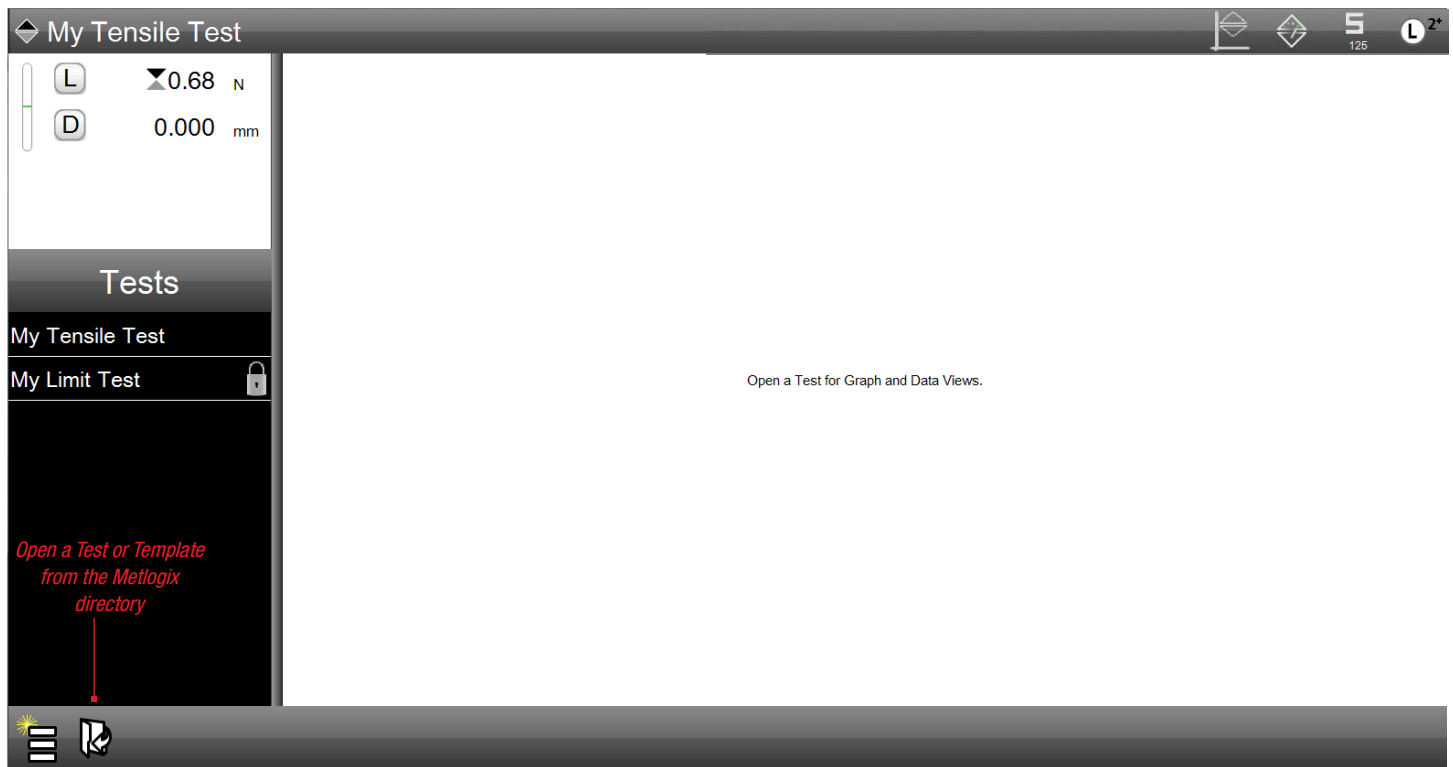
Home Menu - Footer

When at the Home menu where your test setups are listed, two functions are available using the symbols on the footer:

- Create a New Test
- Open a Test or Template

Selecting the Create New Test symbol will launch the L2 Plus Test Builder application. From here, you can begin to create a new test setup.

Selecting the Open symbol takes you to the Metlogix directory. From this directory, you may access the TEST sub-directory and open a test from within this directory. Or, you may access the TEMPLATE sub-directory and create a new test using a test setup template that you created and saved.



L2 Plus Home menu view

New Test

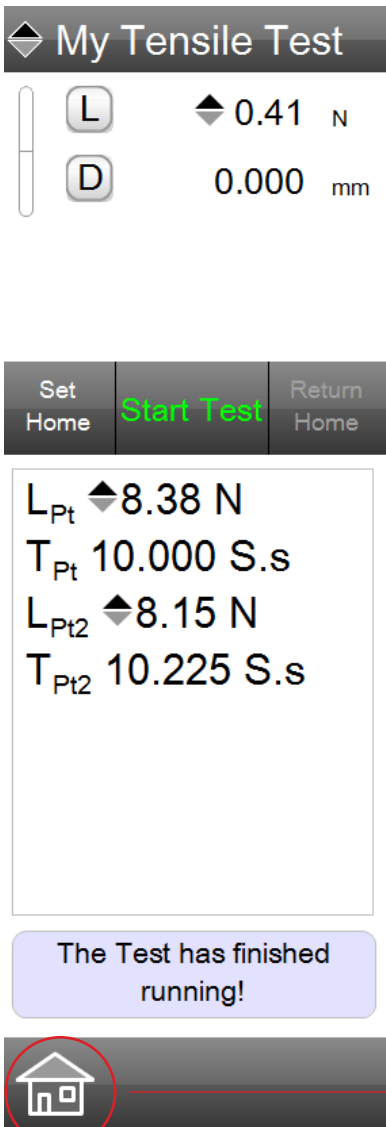
Test Setup Edit - Footer

The footer tools at the bottom of the Controller window when your in an edit view include:

- Home
- New Test
- Edit Test
- Copy Test
- Rename Test
- Delete Test

2.1.4.1 HOME Function

The Home function is displayed in the Controller window. Select the Home symbol to return to the Home view. The Home view is where your test setups are listed. From the Home view, you can select a test to perform or select a test to edit, copy, rename or delete. You can also create a new test from the Home view.



L2 Plus Home function

2.1.4.2 NEW TEST Function

Select the New Test symbol to launch the L2 Plus Test Builder application. This application is used to create your test setups. The procedures used to create a test using the L2 Plus Test Builder application are discussed in detail in **User Guide 3 Creating a Test**.

2.1.4.3 EDIT TEST Function

The Edit Test symbol lets you make changes to an existing test setup. From the Home view, select the test name, then select the Edit symbol. This will launch the L2 Plus Test Builder and the test setup recipe for the selected test name.



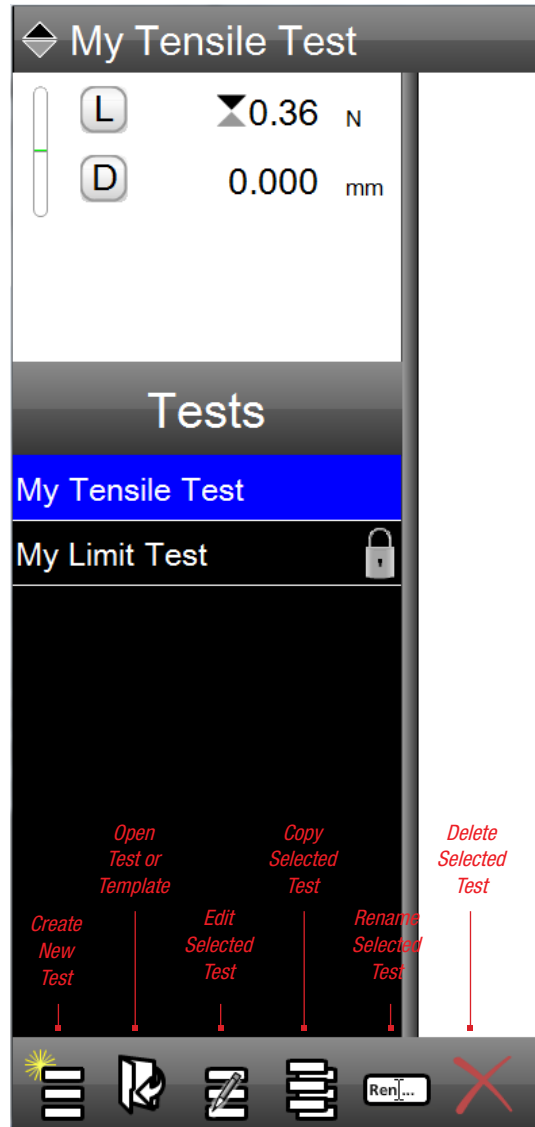
NOTE

A user may be restricted from making changes to a test setup.



NOTE

When editing a complex, multiple step test setup, its recommended that you use the Copy Test function. Copy the test and make changes to that version of the test.



L2 Plus Edit functions

2.1.4.4 COPY TEST Function

The Copy Test function creates a new test using the copy of an existing test setup. From the Home view, select the test name, then select the Copy symbol. A new test is created showing the individual test steps from the original test setup. You may add or delete steps and then save your test with a new test name.



NOTE
It is good practice to copy a test prior to editing. This preserves the original test should you need to recall it.

2.1.4.5 RENAME TEST Function

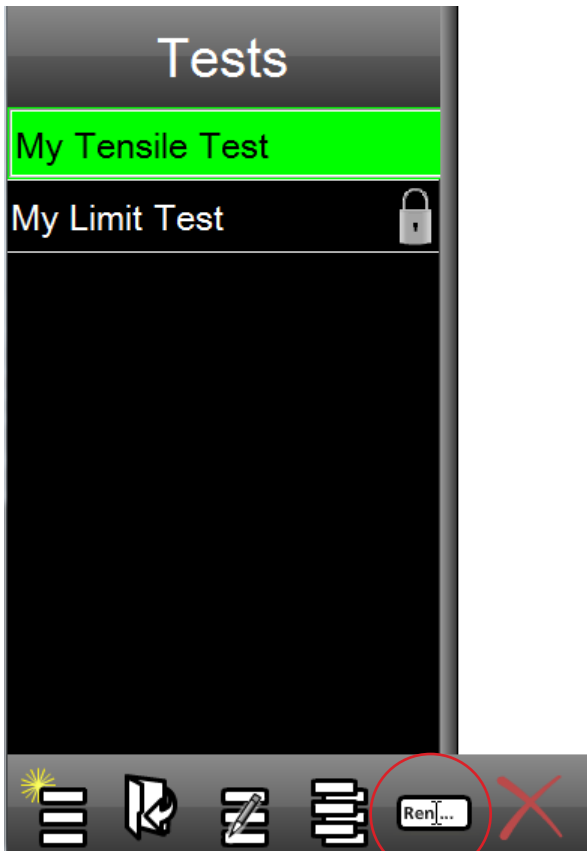
You may rename a test using the Rename function. From the Home view, select the test setup to rename, then select the Rename function. Use a keyboard to enter the new test setup name.



NOTE
Test names may be up to 24 characters in length, including spaces.



NOTE
Test names may be composed using alpha and numeric characters only. Symbols are not permitted.



L2 Plus Rename Test function

2.1.4.6 DELETE TEST Function

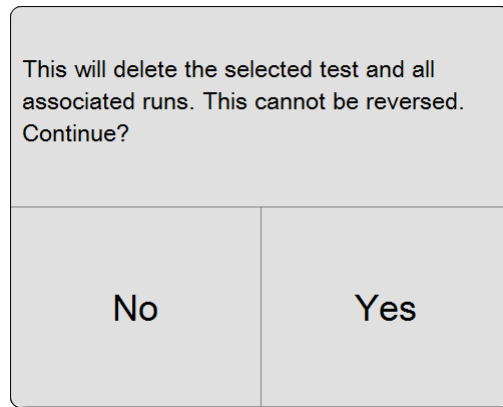
You may permanently delete a test by selecting the test from the Home view menu, and selecting the Delete function.



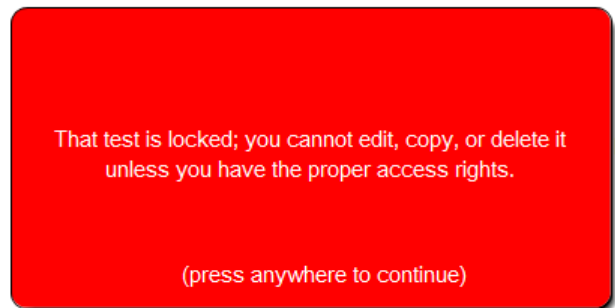
NOTE
A warning message displays when you delete a test setup. This message requires acknowledgement so that you cannot accidentally delete a test setup.



NOTE
When you delete a test, it is permanently deleted from the Home view menu.



L2 Plus Dialog when Deleting an unlocked test setup



L2 Plus Dialog when Deleting a locked test setup

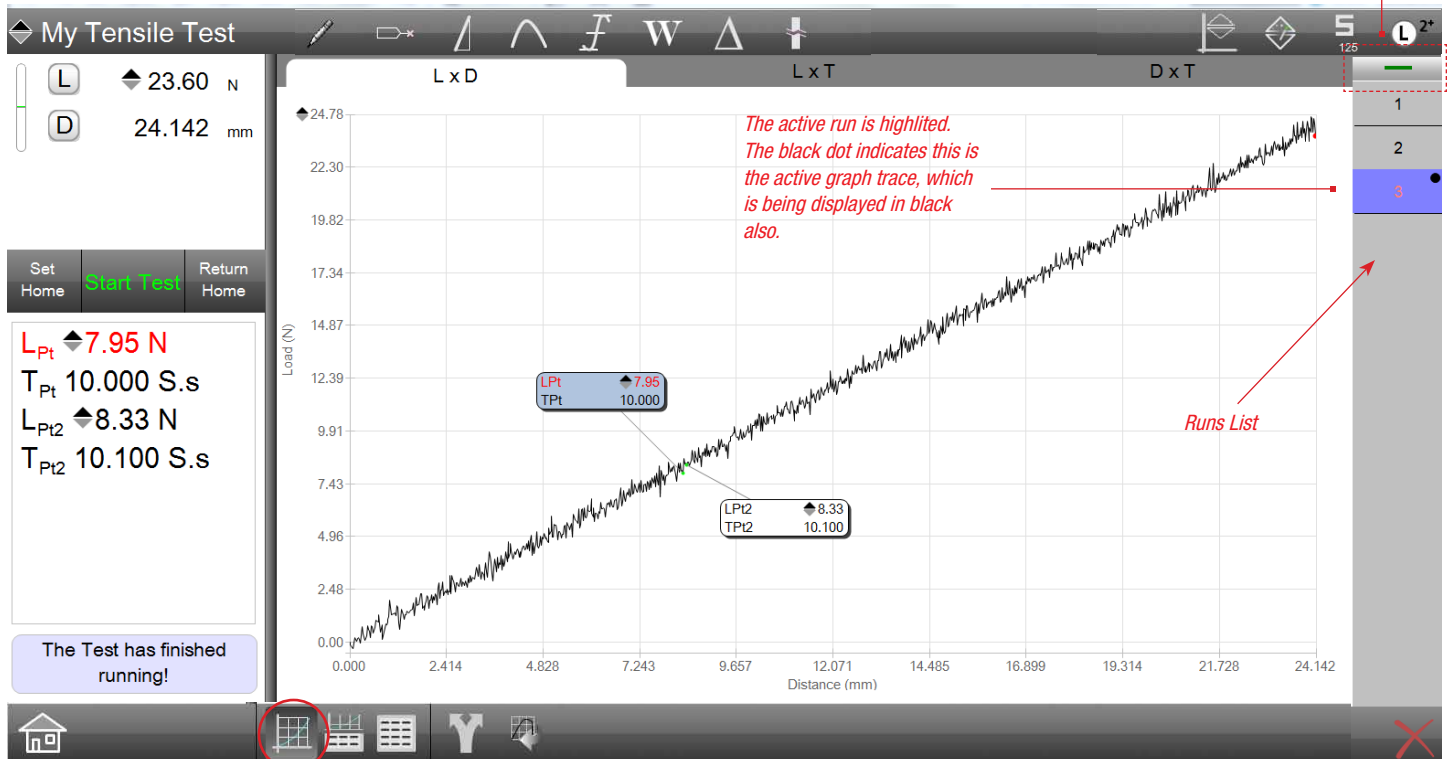
2.1.5 Runs List

Each individual test performed in a test setup is called a Run. The Runs List is a numerically arranged list representing the number of tests that have been performed for the current test setup.

A valid and successful Run is displayed with a black run number.

If a Run has a failed tolerance on a coefficient, the Run number is displayed in red.

If a Run was aborted due to an exception, the Run number is displayed in Red with an “x-out” indicating an invalid test.



L2 Plus Full Graph view
Single Run

2.1.6 Multi-Runs

You may display the graphs of runs in your Runs List individually or collectively (overlays). The Runs List mode is identified as in Single mode or Multi-Run mode by the green bar above the Runs List.

When the bar is single, only one graph is displayed for the run you specify.

Select the bar and the bar shows as a double bar indicating that you are now in Multi-Run mode. Select the Runs you want to display collectively in your graph view. Multi-Run mode operates in either the Full Graph view or Split Graph view.

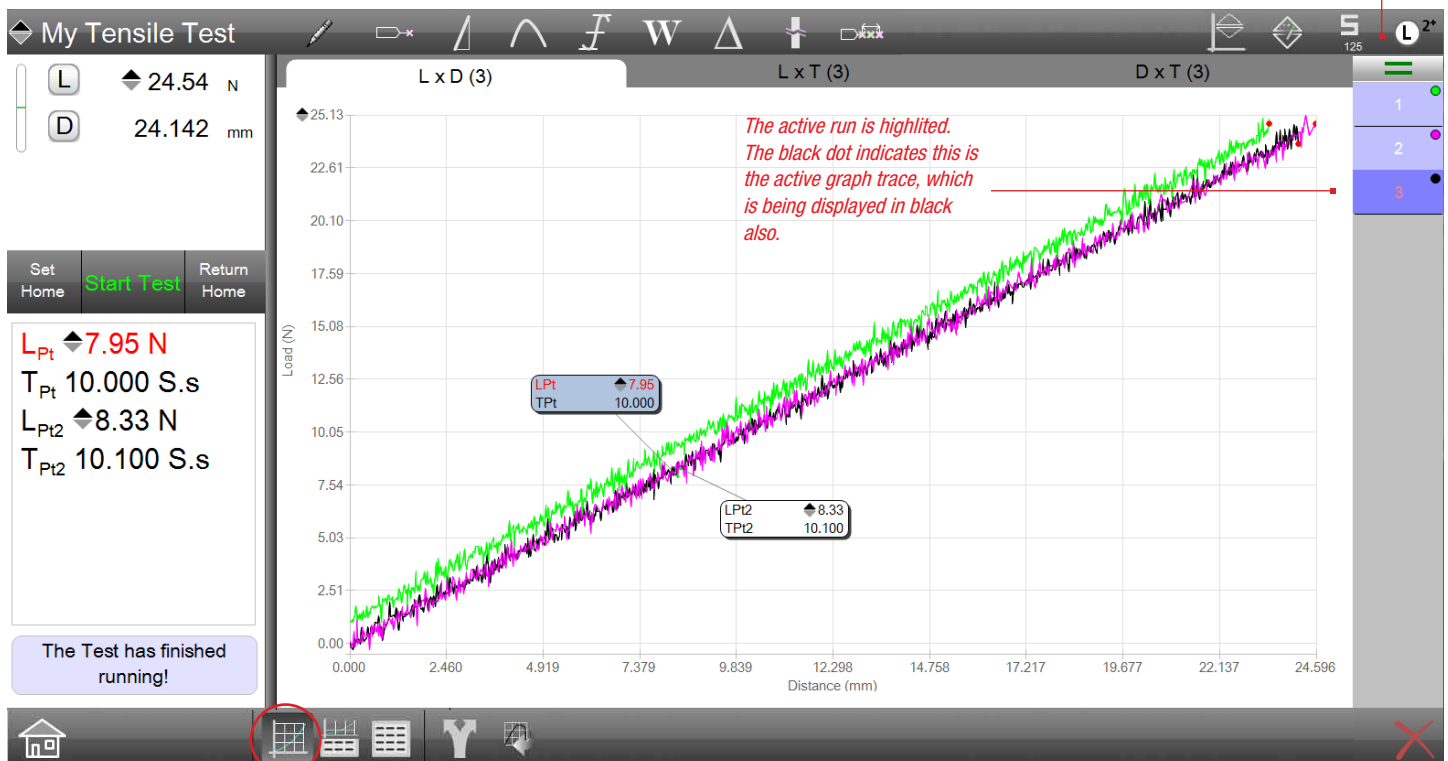
Color dots indicate the trace on the graph that corresponds to that Run number.



NOTE

The active Run in a multi-run view always has the black dot and the graph trace is also displayed in black. If you switch to a different run, that Run will now have the black dot and its trace will display in black.

Select the target to display a single run in the graph or multiple runs together.



L2 Plus Full Graph View
Full graph in multi-view mode

2.2 Graph Views

There are a variety of different graph views available depending on the type of tests being performed. A graph is the most common method for analyzing results using the Graphical Analysis Tools. Using the graph, combined with these tools, you have an easy method for measuring and determining the results for your test.

When tests are performed the following graph formats are available for viewing:

- Load x Distance
- Load x Time
- Distance x Time

Selecting the graph view is done by selecting the tab labeled with the respective graph view type.

Graphs are automatically scaled to a “best fit” size. Graph axes are labeled and increments are calculated based on the data rate and the “best fit” size.

The following sections will illustrate the different graph views available.

2.2.1 Load-Distance Graph View

When no sample is characterized in the test setup, the test graphs will revert automatically to a Load, Distance, Time format. Stress and Strain will no longer be calculated. Select the L x D tab for load (y-axis) and distance (x-axis).

2.2.2 Load-Time Graph View

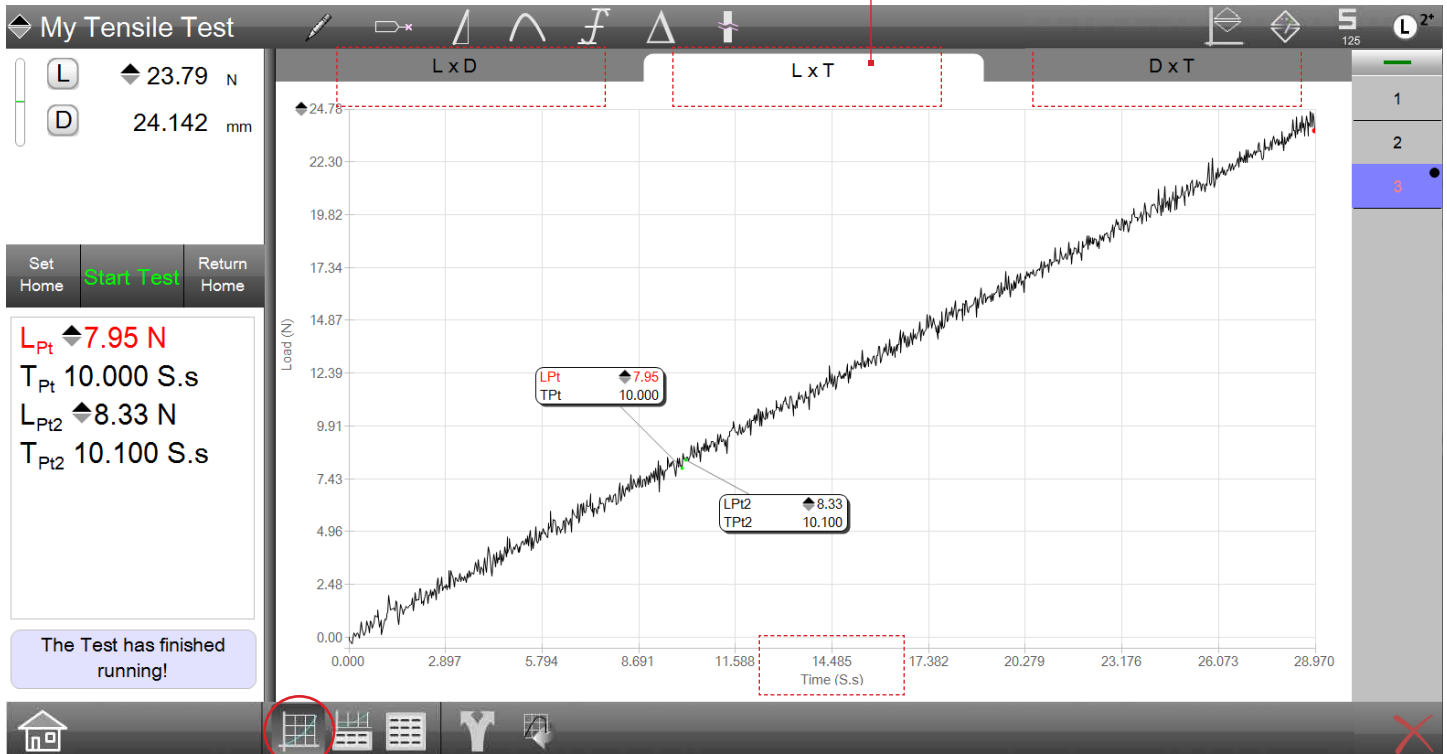
You may display a load versus time graph. Select the L x T tab to view load (y-axis) versus time (x-axis).

2.2.3 Distance-Time Graph View

You may display a distance versus time graph. Select the D x T tab to view distance (y-axis) versus time (x-axis).

Change the graph format by selecting the tab.

- Load x Distance (LxD)
- Load x Time (LxT) shown as “active”
- Distance x Time (DxT)



L2 Plus Full Graph view
Using Load x Time graph format

2.3 Data Table Views

The Data view displays results in a tabular, spreadsheet-like format. Runs are represented by rows. The columns of the table represent the coefficients and other supporting information for the test.

The Data view allows sorting of your data. Select the column header to toggle between ascending and descending order.

When tolerances are used, the Data view displays failed tolerances in red and includes a tendency bargraph.



NOTE

Rows represent runs in the Data view. The row with the reference #1 is Run #1. There are no limits to the number of rows in a Data view. However, you may specify the maximum number of Runs in the Post Test step of your test setup.



NOTE

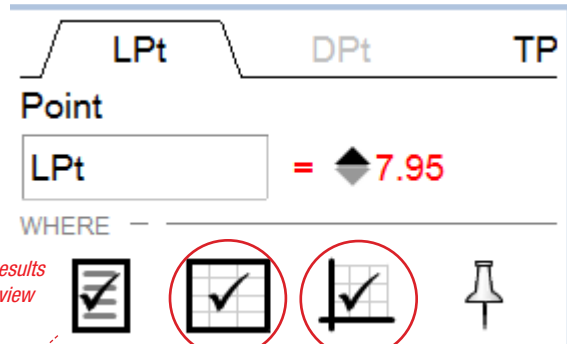
Columns represent coefficients/results. For every coefficient you are using, there is a representative column in the Data view. However, in the Data Definition menu for a coefficient, you have the option of displaying the coefficient in the Data view or not using the WHERE option.

2.3.1 Graph-Data Table Split View

The split view displays the graph and data simultaneously. The individual features and functions of both the full graph and Data view displays are incorporated into this alternate view.

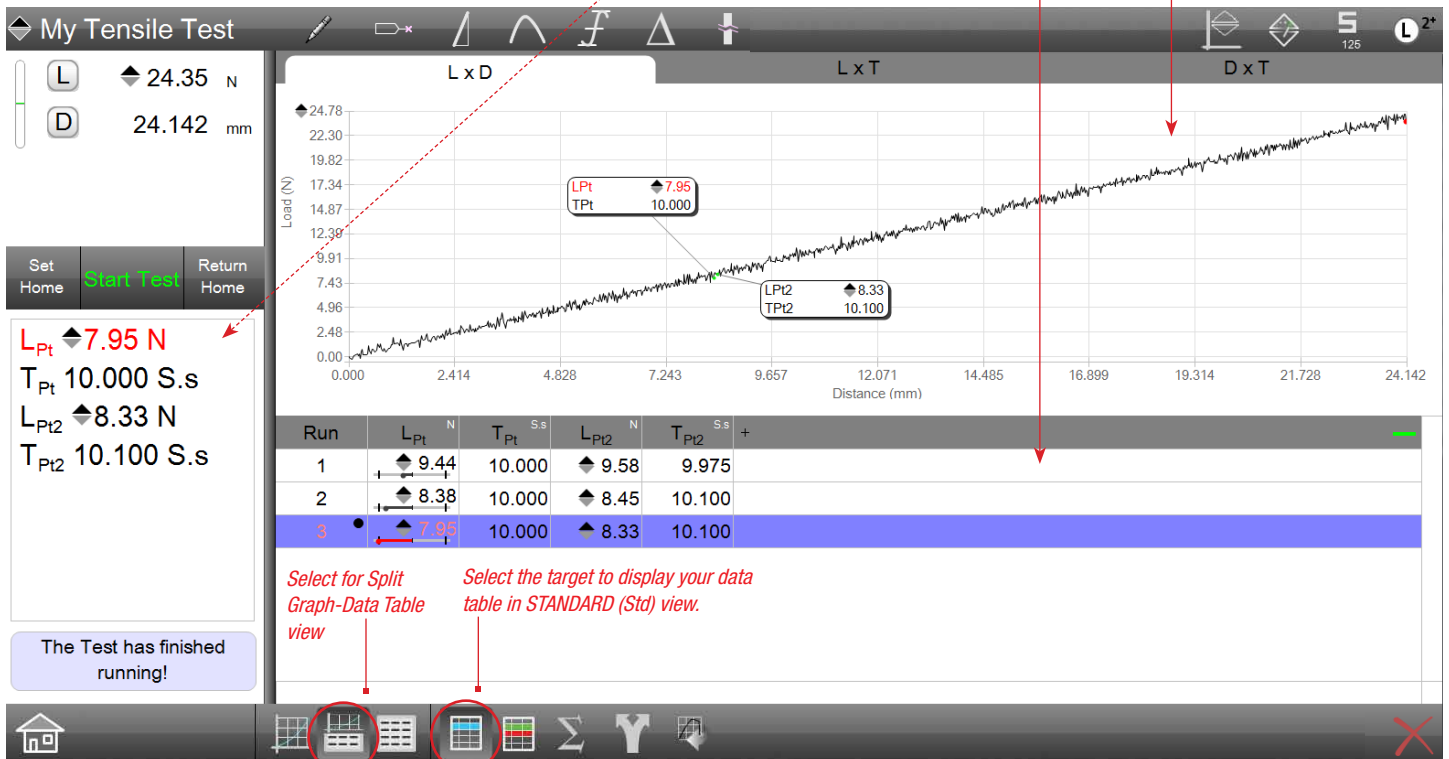
You may use the multi-run function to overlay multiple graph traces and show their corresponding row data.

L2 Plus WHERE Data Definition menu
Shows "where" you want the coefficient LPt displayed



Use the WHERE function in the Data Definition menu to specify where you want to display your coefficient.

The checkmark indicates that LPt is to be displayed in the Results view, Data views and Graph views.



Select for Split Graph-Data Table view

Select the target to display your data table in STANDARD (Std) view.

L2 Plus Split Graph-Data Table view
Displayed in Standard (Std) format

2.3.2 Statistics View

You have the ability to view basic statistical calculations using the Data view or the split view. Whenever data is displayed, selecting the sigma symbol will display the following statistics:

- Minimum
- Maximum
- Range
- Average
- Standard Deviation
- 6 Sigma

If more detailed statistics are required for statistical process control, you may export the raw data in a .csv format and integrate with your SPC software application for more comprehensive analysis and documentation.



NOTE

Statistics are available from the Data view or Graph-Data split view.



NOTE

Statistics may be calculated for all runs in the Data view or you can specify only the runs (rows) you want.

The highlighted row indicates the test run that is displayed in the graph.

You can adjust the viewing area by moving the header bar up/down. The graph is automatically sized.

Use the scroll bar to scroll up/down on your rows in your Data table.

Run	L _{Pt} N	T _{Pt} S.s	L _{Pt2} N	T _{Pt2} S.s
1	9.44	10.000	9.58	9.975
2	8.38	10.000	8.45	10.100
3	7.95	10.000	8.33	10.100
Max	9.44	10.000	9.58	10.100
Min	7.95	10.000	8.33	9.975
Range	1.49	0.000	1.25	0.125
Average	8.59	10.000	8.79	10.058
Std Dev	0.77	0.000	0.69	0.072
6 Sigma	4.60	0.000	4.14	0.433

Select the large sigma symbol to display the statistics for this test setup. Statistics are calculated on all test runs or the runs (rows) you select.

L2 Plus Split Graph-Data Table view
Displayed with Statistics

2.3.3 Tolerance View

When tolerances are used, you have the ability to display your results with your tolerance information. Select the TOL function and your results, including pertinent tolerance information is displayed collectively.

In the Tolerance view, each coefficient occupies a row in the data table. If a test run has five (5) coefficients, there will be five (5) rows for each coefficient.



NOTE
You cannot display statistics and tolerance at the same time.

The coefficients are listed on a row for each test run. The tolerance settings are displayed for all coefficients where a tolerance has been setup.

The deviation bargraph displays where the result resides relative to the tolerance range- high or low or within the range. Failed results are displayed in red.

The Comment cells allow the operator to include comments on this result or the test run in general. Select the cell and enter your comment.

My Tensile Test

L 24.04 N
D 24.142 mm

Set Home **Start Test** Return Home

L_{Pt} 7.95 N
 T_{Pt} 10.000 S.s
 L_{Pt2} 8.33 N
 T_{Pt2} 10.100 S.s

The Test has finished running!

Run	Coef	Units	Actual	Limit 1	Limit 2	Deviation	P/F	Comment
1	LPt	N	9.44	8.00	12.00		Pass	
1	TPt	S.s	10.000					
1	LPt2	N	9.58					
1	TPt2	S.s	9.975					
2	LPt	N	8.38	8.00	12.00		Pass	
2	TPt	S.s	10.000					
2	LPt2	N	8.45					
2	TPt2	S.s	10.100					
3	LPt	N	7.95	8.00	12.00		Fail	
3	TPt	S.s	10.000					
3	LPt2	N	8.33					
3	TPt2	S.s	10.100					

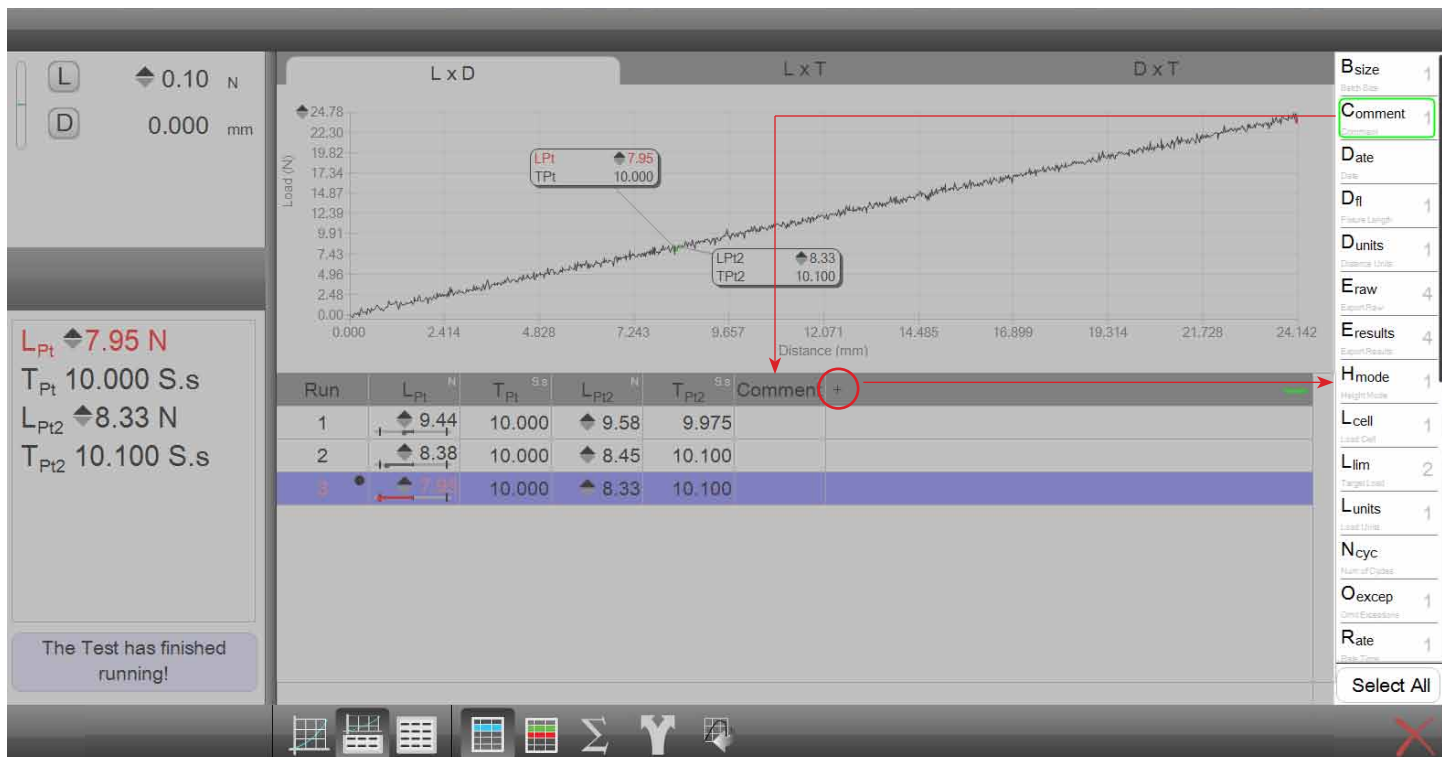
The highlighted test run (#3) indicates which test run is being displayed in the Results view. If a split graph-data view was shown, the graph would indicated for #3.

2.3.4 Extra Coefficients

L2 Plus allows certain information to be included in data table views that are not a measured result. From a Data view, the far right column contains a “+” sign. When you press or select this symbol, a list of “extra coefficients” are presented.

Extra coefficients may be useful to include in your Data views. Simply select the coefficient and it will be added to your table. You can move the column or remove the coefficient by selecting or de-selecting from the list of values.

Select the “+” symbol to display extra coefficients that you may include in your data table. These coefficients are generally not a measurement result, but additional information to help identify your test results.



L2 Plus Split Graph-Data Table view
 Displaying Extra Coefficients list of values to include in your table

2.4 Exporting Data

Result data may be exported automatically or on-demand using the Share function. Result data may be the results or the raw data of the entire test run from start to completion.

You may also export certain information to the clipboard where it may be pasted into other applications, e.g. Microsoft® Excel®, Word®, etc. And you have the ability to export image files in different formats, again for incorporation into other types of document applications.



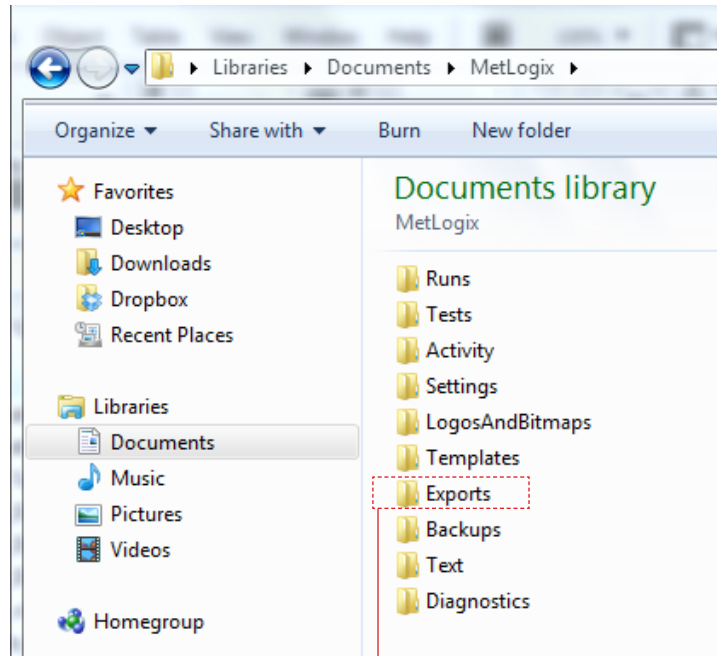
NOTE

The factory default setting for Sampling Rate (Hz) is 100 (100 samples per second). The sampling rate may be set between 5 and 2000 samples per second. Higher sampling rates are prone to noise, so use care when specifying the rate. In most cases, 100 samples per second is sufficient. Lower sampling at 20-30 Hz is similar to what you would sample at using RS232.

Data and information may also be exported using the Share function. The Share function appears in the footer tool bar. There are four basic share options when you select this symbol:

- .CSV
- Raw Data
- Clipboard
- .BMP Image

L2 Plus Metlogix Directory
Exported information is saved to the Exports sub-directory



Exports can be saved to the Export sub-directory within the Metlogix directory. Or, you may map the export to a location on your network using the File Settings.

Run	L _{Pt} N	T _{Pt} S.s	L _{Pt12} N	T _{Pt12} S.s	+
1	9.44	10.000	9.50	9.975	Export Result data
2	8.38	10.000	8.45	10.100	
3	7.95	10.000	8.33	10.100	Export to clipboard

L2 Plus Data Table Standard
Selected the Export on-demand function (Share)

.CSV Function

When the .CSV function is selected, the results for the currently shown test run is exported to the Export sub directory in the Metlogix directory.



NOTE

When .CSV is selected using the Share function, a new file is created for the Export sub directory regardless of how you have configured Export Results in the Post Test step.

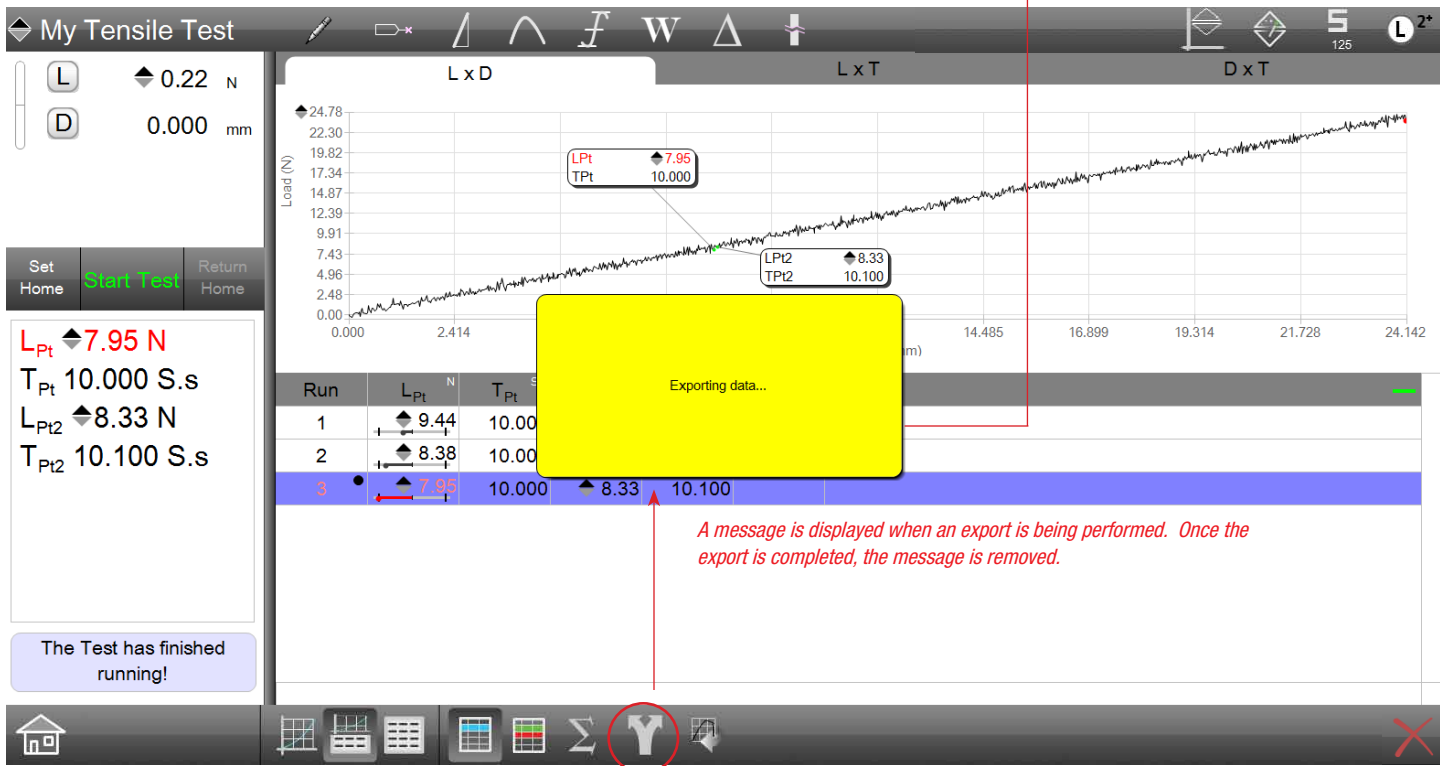
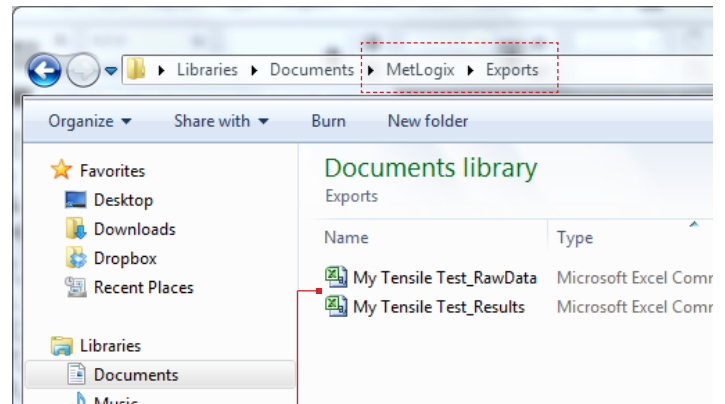
Raw Data Function

When the Raw Data function is selected using the Share function, a new raw data file is created for the Export sub directory regardless of how you have configured Export Raw in the Post Test step.

Clipboard Function

When the Clipboard function is selected, the displayed results are copied and saved to a clipboard where they may be pasted into another document, e.g. Word or Excel. The results only are saved.

L2 Plus Metlogix Directory
Exports being saved to sub-directory called EXPORTS



A message is displayed when an export is being performed. Once the export is completed, the message is removed.

L2 Plus Full Graph View

Shows Load x Distance graph with Data view and tolerance

2.4.1 Export Raw Data

Raw data are all of the data points captured during a test run. When you set the Sampling Rate (Hz) in the Pre Test step, you have specified how many data points per second are being sampled and used to generate your graph and other measurements.

When the Export Raw option is enabled, the raw data points for the completed test will be saved as a .csv file and saved to a directory that you designate in the Main Settings option.

- Go to the Main Settings menu.
- Select File Locations.
- Select the Directory where you want your data saved to.



NOTE

When data is exported, it is exported in a .csv format.



NOTE

You may export up to 100,000 rows of data. A .csv file is created for each 25,000 rows from your test run. Up to four (4) separate .csv files are created if you are exporting 100,000 rows of data.

The maximum number of rows for data is 100,000.

The maximum number of .csv files created for a test run is four (4).

L2 Plus Post Test Setup

In the Post Test step of your test setup, you may specify how this data is to be used by defining whether to export or not.

Once you have designated a file location, you have two options on how to transmit the file to the location:

Overwrite Data

When Export Raw = OVERWRITE, raw data is exported to a .csv file. There is a single file and it includes all the raw data for that test run.



CAUTION

When Overwrite is specified, all previous raw data for the previous run is over-written- it is permanently replaced by the new data.

Auto Number Data

When Export Raw = AUTO NUMBER, raw data is exported to a .csv file. Each test run creates a new file and each new file is sequentially numbered for identification.



NOTE

If you want to maintain the data for all test runs, use Auto Number. A separate file is created for each test run.

step	time	raw load	load	raw distance	distance	xtm	distance used
1	2	0	48.97 N	0.46 N	48.556 mm	0.091 mm	0.091 mm
2	2	0.109	48.88 N	0.23 N	48.646 mm	0.182 mm	0.182 mm
3	2	0.219	49.11 N	0.55 N	48.738 mm	0.273 mm	0.273 mm
4	2	0.328	48.67 N	0.67 N	48.829 mm	0.364 mm	0.364 mm
5	2	0.437	48.54 N	0.42 N	48.92 mm	0.455 mm	0.455 mm
6	2	0.546	49 N	1.06 N	49.011 mm	0.546 mm	0.546 mm
7	2	0.655	49.33 N	0.57 N	49.101 mm	0.637 mm	0.637 mm
8	2	0.765	49.08 N	0.76 N	49.193 mm	0.728 mm	0.728 mm
9	2	0.874	49.37 N	1.4 N	49.284 mm	0.819 mm	0.819 mm
10	2	0.983	49.46 N	1.01 N	49.375 mm	0.91 mm	0.91 mm
11	2	1.092	49.4 N	1.01 N	49.466 mm	1.001 mm	1.001 mm
12	2	1.201	49.94 N	1.18 N	49.556 mm	1.092 mm	1.092 mm
13	2	1.311	49.48 N	0.63 N	49.648 mm	1.183 mm	1.183 mm
14	2	1.42	49.73 N	1.35 N	49.739 mm	1.274 mm	1.274 mm
15	2	1.529	49.86 N	1.76 N	49.83 mm	1.365 mm	1.365 mm
16	2	1.638	49.82 N	1.28 N	49.921 mm	1.456 mm	1.456 mm
17	2	1.747	49.65 N	2.11 N	50.011 mm	1.547 mm	1.547 mm
18	2	1.857	50.02 N	1.32 N	50.103 mm	1.638 mm	1.638 mm
19	2	1.966	50.17 N	1.91 N	50.194 mm	1.729 mm	1.729 mm
20	2	2.075	50.34 N	2 N	50.285 mm	1.82 mm	1.82 mm
21	2	2.184	50.77 N	1.77 N	50.376 mm	1.911 mm	1.911 mm
22	2	2.293	50.32 N	1.4 N	50.466 mm	2.002 mm	2.002 mm
23	2	2.403	50.42 N	1.95 N	50.556 mm	2.093 mm	2.093 mm
24	2	2.512	50.76 N	1.97 N	50.649 mm	2.184 mm	2.184 mm
25	2	2.621	50.94 N	2.47 N	50.74 mm	2.275 mm	2.275 mm
26	2	2.73	50.65 N	1.88 N	50.831 mm	2.366 mm	2.366 mm
27	2	2.839	51.5 N	3.08 N	50.921 mm	2.457 mm	2.457 mm
28	2	2.949	51.02 N	2.23 N	51.013 mm	2.548 mm	2.548 mm
29	2	3.058	51.01 N	1.79 N	51.104 mm	2.639 mm	2.639 mm
30	2	3.167	51.22 N	2.23 N	51.195 mm	2.73 mm	2.73 mm

Export Raw exports all of the data points from your graph based on the sample rate you set in Pre Test.

Export Results exports only the result data.

Test Id	Run No.	UID	Run	LPT	Limit 1	Limit 2	TPT	LPT2	TPT2
1	1	13:10:22:1	1	9.44 N	8	12	10 S.s	9.58 N	9.975 S.s
2	2	13:10:22:1	2	8.38 N	8	12	10 S.s	8.45 N	10.1 S.s
3	3	13:10:23:1	3	7.95 N	8	12	10 S.s	8.33 N	10.1 S.s

2.4.2 Export Results

The Export Results function only exports the actual results data. No raw data is included. For every coefficient in your test, when Export Results is enabled, the results for your coefficients are exported in a .csv format to the File Location you specified in Settings.

The default for Export Results is No- you are not going to automatically export the results. However, you may also specify the following types:

Append Result Data

When Export Results = APPEND, results are exported to a .csv file within the Directory you established prior to your test. There is a single file and each result is appended to the file as a new row.

Overwrite Result Data

When Export Results = OVERWRITE, results are exported to a .csv file. There is a single file and there is only one row of results. When a new test is completed, the data in the row is replaced with the new data.

Auto Number Result Data

When Export Results = AUTO NUMBER, results are exported to a .csv file. Each test result creates a new file and each new file is sequentially numbered for identification.

2.4.3 Export to Clipboard

The export to clipboard function may be used to export your results data to an external document. From the current display, when the Share function is selected and then the Clipboard function, the Run number and all results displayed are saved to a clipboard where they may be pasted into another document, e.g. Word, Excel.



NOTE

When the clipboard is used, only the results are available for paste.

Test Id	Run No.	UID	Run	Lpt	Limit 1	Limit 2	TPt	Lpt2	TPt2	Comment
1	1	13:10:22:1	1	9.44 N	8	12	10 S.s	9.58 N	9.975 S.s	
2	2	13:10:22:1	2	8.38 N	8	12	10 S.s	8.45 N	10.1 S.s	
3	3	13:10:23:1	3	7.95 N	8	12	10 S.s	8.33 N	10.1 S.s	

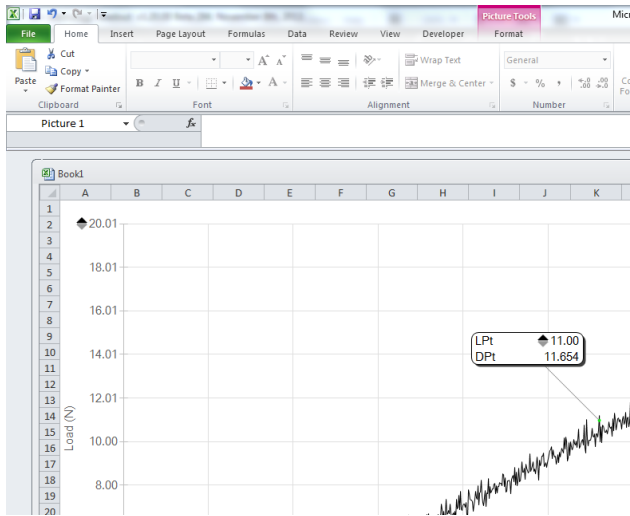
Excel Spreadsheet created from Export Result .csv file

2.4.4 Export Image

You can export an image of the currently displayed view using the Share function. The image is saved as a bitmap (.bmp) and applies to any views with a graph.

When you export an image using the Share function, a .bmp image file is created and sent to a “clipboard” where you may paste the image into another document, e.g. Microsoft Word or Excel.

The .bmp image you create is not saved in a directory.



L2 Plus
Bitmap pasted into Excel

2.5 Offline Archived Run Analysis

You may use the offline archive function to compare historical run results to current and active runs. Comparing archived runs with active runs should be performed using the Multi-view function.

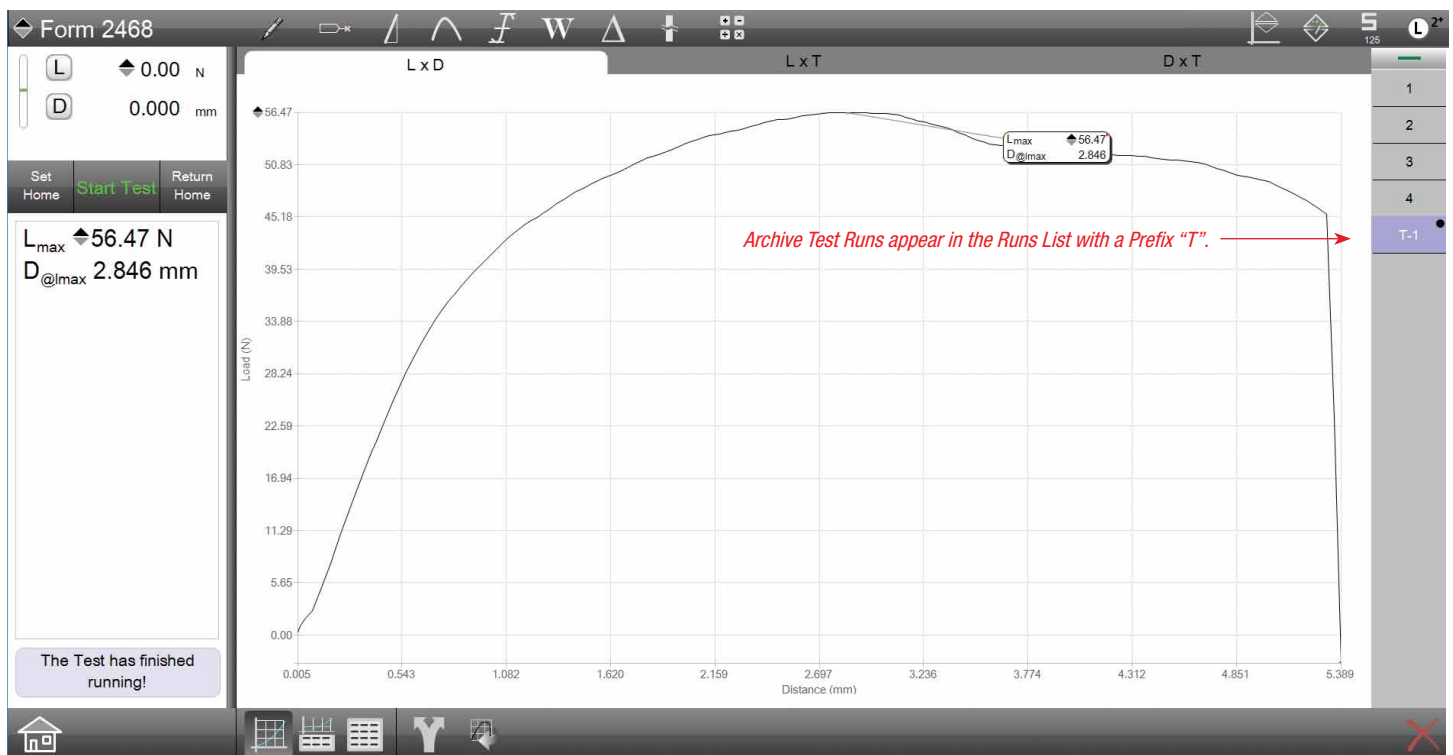
2.5.1 Archived Test Runs

When a Runs Limit is met, the oldest test run is moved to the Archive directory within your Metlogix directory. The archived run may then be opened using the Offline tool, which when selected, opens the Archive directory. From the Archive directory, you may select any test run. Selecting Open, the archived test run is placed in your active Runs List. Archived runs have a prefix “T”. For example, when you load an archived run onto your active Runs List, the first archived run will display as “T-1”.



NOTE

Any test run within your Archive directory may be imported to your active test and Runs List. Use care to make sure you are importing test runs that are associated with your current test setup and your current Runs List.



Full Graph showing Archived Run for analysis and comparison to Active Runs

2.5.2 Importing an Archived Run

Selecting the Archive function will open the Archive within the Metlogix directory, or where you have the Archive directory mapped to on your network.

To import an archived test run, select a run from the list. You may select more than one. The selected run does not need to be from the same test setup either.



NOTE

You may select any test run from the Archive directory. The selected test run does not have to have been created using the test setup associated with the active test runs.

The screenshot shows the 'Run to Import' dialog box with the following table of files:

Name	Date modified	Type	Size
Formula Test_00001.mbrundata	11/26/2014 9:43 AM	MLXRUNDATA File	11 KB
Formula Test_00002.mbrundata	11/26/2014 10:40 ...	MLXRUNDATA File	17 KB
Molar Force-Extension_PM Unknown_00...	11/12/2014 3:50 PM	MLXRUNDATA File	1 KB
My Break Test_00001.mbrundata	11/26/2014 3:16 PM	MLXRUNDATA File	21 KB
My Break Test_00002.mbrundata	11/26/2014 3:16 PM	MLXRUNDATA File	18 KB
My Break Test_00003.mbrundata	11/26/2014 3:16 PM	MLXRUNDATA File	16 KB
My Rupture Test_Ctrl V4 M 357_000001.m...	11/26/2014 1:12 PM	MLXRUNDATA File	5 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:47 AM	MLXRUNDATA File	64 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:49 AM	MLXRUNDATA File	65 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:52 AM	MLXRUNDATA File	1 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:54 AM	MLXRUNDATA File	74 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:56 AM	MLXRUNDATA File	71 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:58 AM	MLXRUNDATA File	73 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 8:59 AM	MLXRUNDATA File	65 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 9:01 AM	MLXRUNDATA File	80 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 9:05 AM	MLXRUNDATA File	65 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 9:06 AM	MLXRUNDATA File	59 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 9:08 AM	MLXRUNDATA File	54 KB
Tine Compressive Force T_Ctrl V3 Narro...	11/12/2014 9:10 AM	MLXRUNDATA File	73 KB

Annotations in the image include:

- Red dashed box around the 'ARCHIVE' button: *Select ARCHIVE function.*
- Red dashed box around the 'Archives' sub-directory: *Opens the Archives sub-directory.*
- Red dashed box around the selected file: *Select the test runs you want to import.*
- Red dashed box around the 'Open' button: *Select Open.*
- Red text on the right: *Delete an imported test run like any test run using the Delete function.*

Full Graph showing Archived Runs sub-directory

2.5.3 Analyzing with an Archived Run

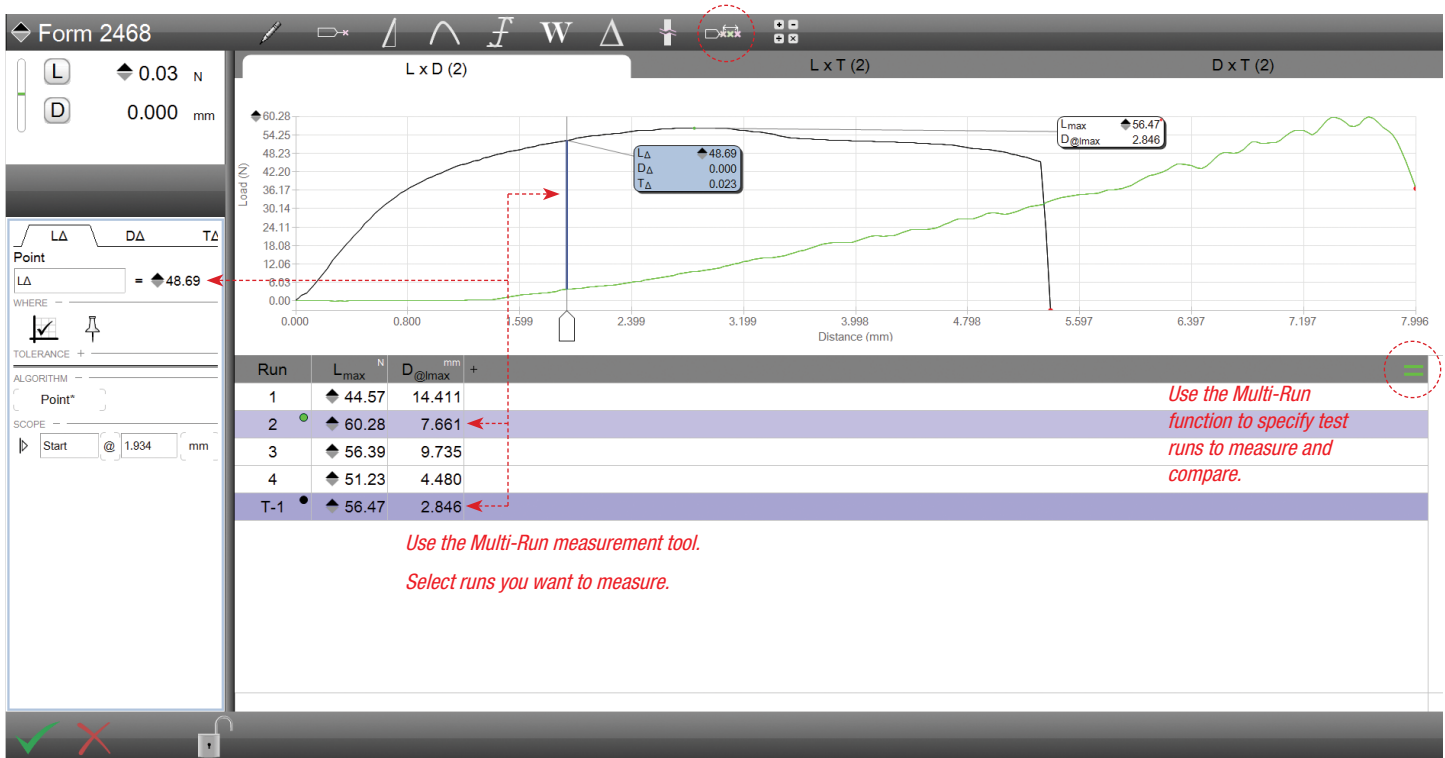
When an archived test run is imported to your active Runs List, the graph and data that make up the graph are copied to your L2 Plus system. You can then use your measurement tools to take new measurements. Or, you can use the measurements from your current active test runs to compare results with historical runs.

It may be necessary to re-measure results in the archived Run. Normally, when the archived Run is imported, the results associated with the current test Runs are automatically calculated and displayed with the archived Runs graph.



NOTE

When importing an archived Run, the archived Run may first show “XXX.X” for its coefficients. You may need to “re-link” the archived Run. You may do so, by simply choosing one of the active test runs, and then the archived run while in Multi-view.



Split Graph showing Measurement between Archive Run # T-1 and Active Run #2

2.5.4 Statistics using an Archived Run

Statistics may be re-calculated to include your Archived Run. You must select the archived Run with any of the active Runs you want statistical calculations for.

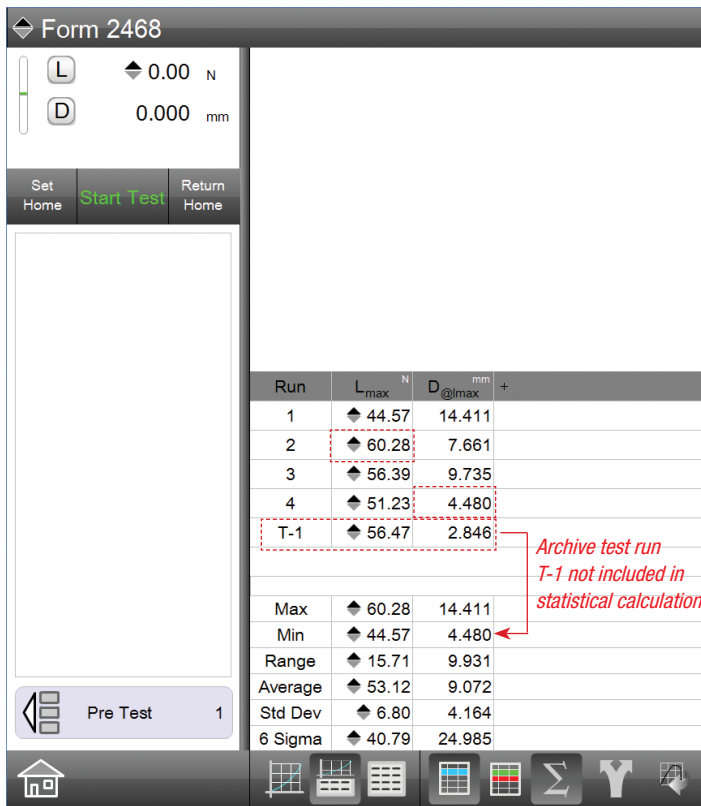
If the archived Run is not selected, its measured results are not included in your statistical results. Only the results from your active Runs List will be used to calculate statistics.



NOTE

An imported archive test run does not affect the statistics in your active test.

If you want to include the archived test run in your statistical calculation, you must use the multirun function and select the runs you want used for statistical calculations.



Statistics calculated on Active Test Runs #1 - 4
Archive Test Run T-1 Not Included

2.5.5 Removing (Deleting) an Archived Run

Remove the archive test run using the delete function on the display view. When the archived test run is deleted, it is deleted from the Runs List. The archived test run is not deleted from the source Archive directory.



NOTE

When you delete an archived run from a display view, the archived test run is removed from the Runs List. It is not permanently deleted from the Archive directory.



Statistics calculated on selected Test Runs
Archive Test Run #T-1 and Active Run #4

2.6 Navigation Tools

L2 Plus software is designed to allow you to achieve maximum results thru an array of graphic analysis tools. The software is optimized around touchscreen navigation, allowing you to touch the function you desire and get immediate results. Lists of values, touch targets, combo buttons, pinch zoom, panning, text blocks, tabs, etc. are all supported within your L2 Plus software.

In addition to touchscreen navigation, L2 Plus software may also be used with mouse and keyboard navigation as well.

2.6.1 Touchscreen Gestures

L2 Plus software is optimized for touchscreen operation. Large touch targets are used to make selection precise and easy. Plus, all common types of touchscreen gestures are supported.

Gesture	How to perform	Description
Tap	Touch/tap the item you are interested in; can be a list of values; graphic analysis tool, view format, etc.	Most common method for selecting an item using touchscreen gestures.
Press and Hold	Press and hold does the same thing as right-clicking an item with a mouse.	To perform the action, touch the screen where you want to right-click, hold until a complete circle appears, and then lift your finger. The shortcut menu appears after you lift your finger.
Pan	Touch and drag with either one or two fingers	Use panning to see another part of a view that has scroll bars. For example, you can pan to see part of a long graph trace that doesn't appear in the window.
Zoom	To zoom out, touch two points on the item, and then move your fingers toward each other, as if you're pinching them together. To zoom in, touch two points on the item, and then move your fingers away from each other, as if you're stretching them apart.	Use zooming to make an item on the screen larger or smaller. With a graph trace, zooming in shows a smaller area in more detail; zooming out shows a larger area.
Window Shade	Increased or decreases the size of a Window.	Used in the Controller view. Lets you increase or decrease the Controller view- more room in results area and less room in Controller area.

L2 Plus Touchscreen Gestures

2.6.1.1 Touch Targets

Touch targets are used throughout your L2 Plus software. Targets are generally defined as tabs or pads, however, other forms are also used. For example, you can select a row in the Data view to view the graph of the selected run. Selecting a marker will open the Data Definition menu for the coefficients displayed in the marker. Text blocks are used, and when touched, allow you enter alpha and numeric characters.



NOTE

When a graph is displayed, you may touch above or below the graph when using certain tools to achieve a result. For example, if you use the Min/Max/Avg tool to find the maximum load, select the tool then select anywhere above the graph trace. The marker for Lmax will displayed at the point equal to the maximum load.

2.6.1.2 Panning

Panning is used in the graph views. Panning only operates when the graph has been made larger using the zoom function. This is because all graphs are automatically scaled to full view.

When the zoom function is used to increase the resolution of the graph and to magnify a particular area of the graph, scroll bars appear on both the y-axis and x-axis. You may pan the graph by operating these scroll bars, either by touch or using a mouse.

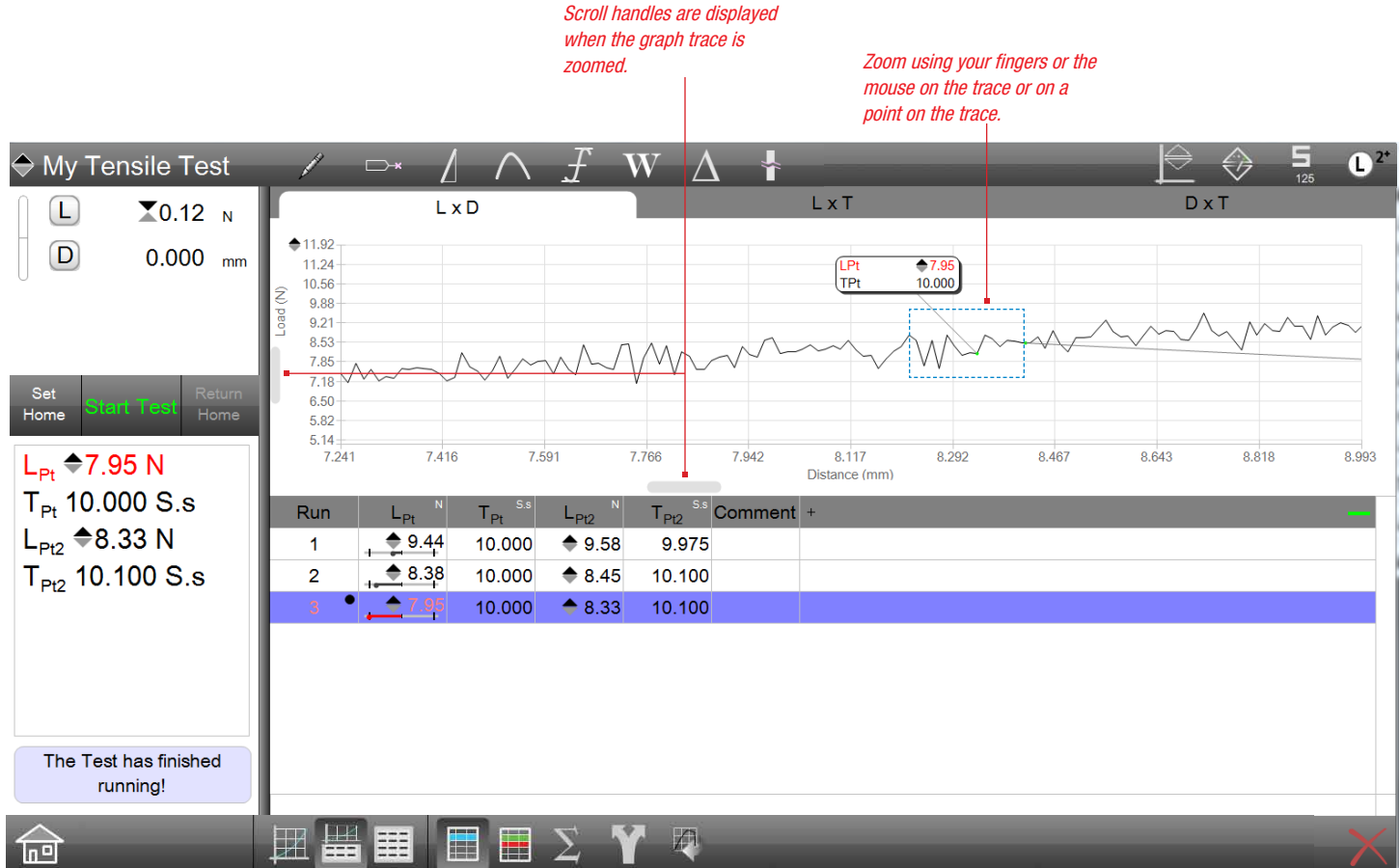
2.6.1.3 Pinch Zoom

You may zoom and enlarge a graph trace by using two fingers to frame the area to zoom and then moving your fingers apart as you touch the screen of your L2 Plus workstation.



NOTE

To return the graph trace size to its original shape, simple double tap the graph view.



Panning Graph

Use scroll handles to pan along the graph trace

2.6.1.4 Window Shading

The Controller view has the only window shading function. This allows you to increase or decrease with viewable area in both the Controller and Results view sections.

To increase/decrease the viewable area, select the separation bar and slide the bar up/down.

2.6.2 Mouse Navigation

Mouse navigation may also be used to navigate through your L2 Plus software. You may use a mouse exclusively or use a mouse with touchscreen navigation.

2.6.2.1 Mouse Up/Down

Use the mouse up/down key to scroll up/down within a view. In a graph view, using the up/down key increases/decreases the graph size.

2.6.2.2 Marquee Selection

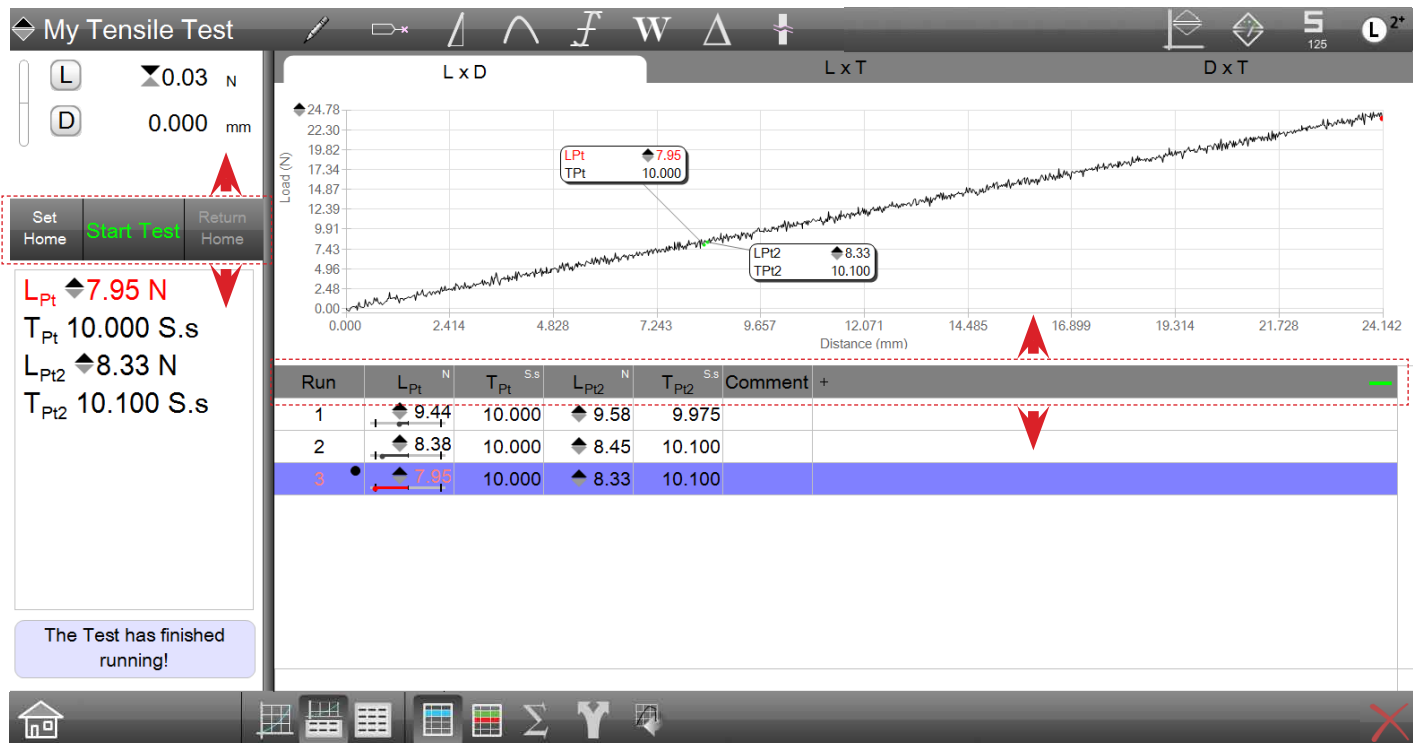
Use the mouse to draw a marquee box which serves to zoom the area within the box. When a marquee box is used to zoom, the graph trace within the marquee may be zoomed larger or smaller.

2.6.2.3 Point Zoom

Point zoom is a unique function available when using a mouse. Point zoom allows you to select a specific point on the graph trace. Once this point is latched, you can then use the mouse up/down function to zoom based on that particular point.

2.5.3 Keyboard Entry

A USB or wireless keyboard may be used to enter alpha and numeric characters.



Window Shading
Expand or decrease a window are by adjusting the bars

2.5.3.1 Text Length Rules

The following table shows the text character limits for various text blocks used within L2 Plus software.



NOTE

A space occupies one character.



NOTE

Text may only use alpha and numeric characters.
Punctuation characters, may not be used.

Text Block Location	Maximum Character Length (including spaces)
Test Name	24 characters
Sample Material Name	12 characters
Batch Name	16 characters
Coefficient Name	16 characters

Text Length Rules



Corporate Headquarters

The L. S. Starrett Company
121 Crescent Street
Athol, MA 01331 USA
Tel: 978-249-3551

Starrett Metrology Division

Starrett Kinematic Engineering, Inc.
26052-103 Merit Circle
Laguna Hills, CA 92653 USA
Tel: 949-348-1213