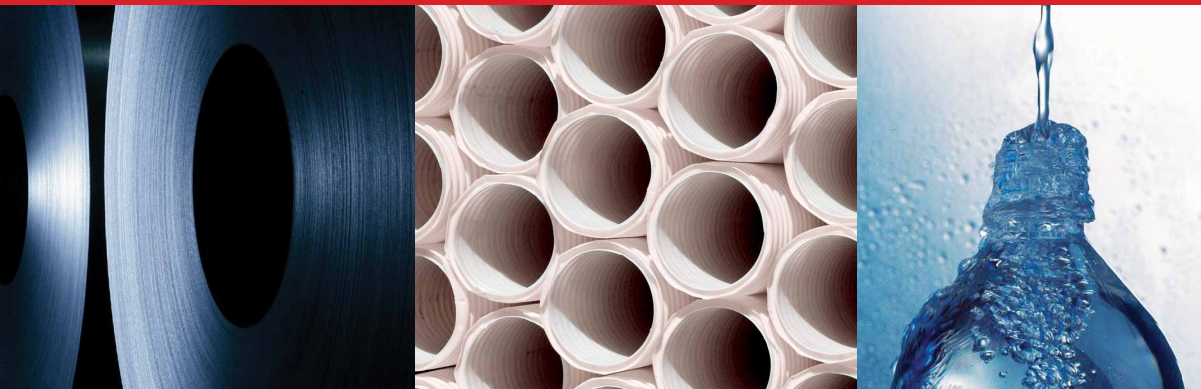


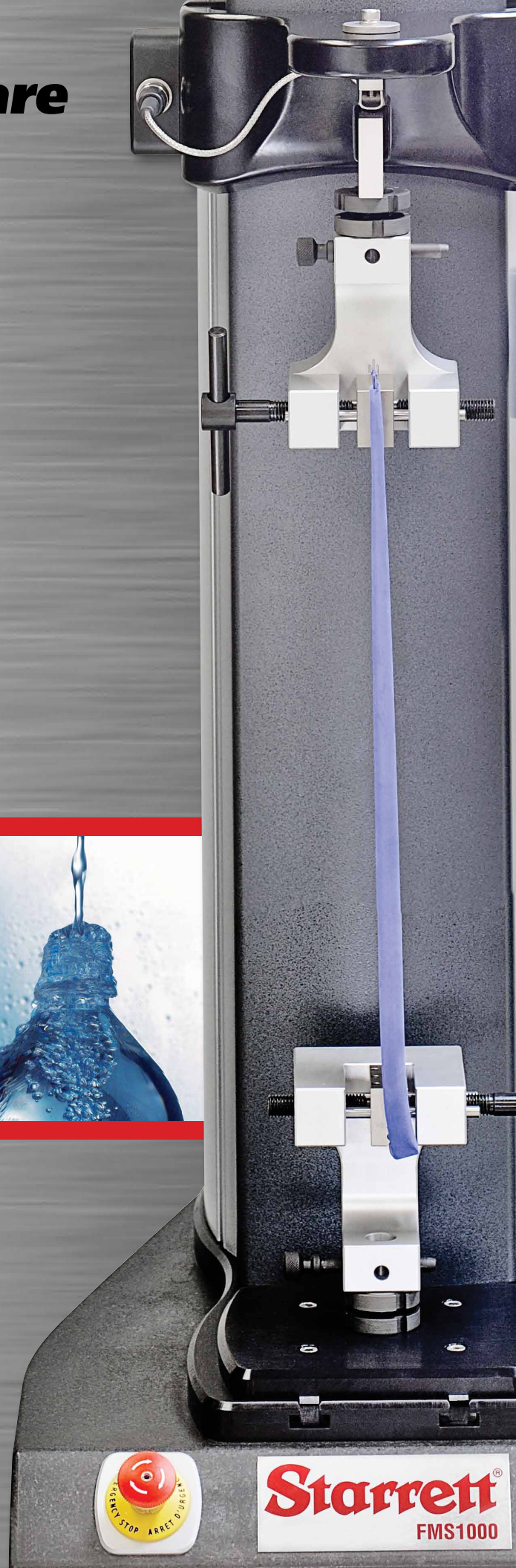
# **L2 Plus Series Software for Advanced Force Measurement**

## **Performing a Test**



# **Starrett®**

**The Better Solution**



**Starrett®**  
FMS1000



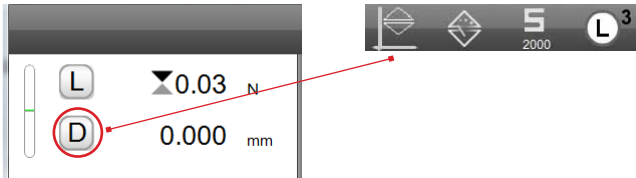
Table of Contents		Page
<b>4.0</b>	<b>PERFORMING AN L2 PLUS TEST</b>	<b>4</b>
4.1	L2 Plus Test Modes of Operation	4
4.1.1	Standard Operating Mode	4
4.1.2	Height Operating Mode	4
4.1.2.1	Setting Datum	5
4.2	L2 Plus Status Indicators	7
4.2.1	Test Mode Indicator	7
4.2.2	Load Bargraph	8
4.2.3	Measured Load Indicator	9
4.2.4	Measured Displacement Indicator	9
4.2.5	Test/Step Velocity Indicator	10
4.3	L2 Plus Status Messages	10
4.3.1	Step Messages	10
4.3.1.1	Load Limit Message	11
4.3.1.2	Distance Limit Message	11
4.3.1.3	Break Message	11
4.3.1.4	Hold Message	11
4.3.1.5	Cycle Count Message	12
4.3.1.6	Cycle Duration Message	12
4.3.1.7	Prompt Message	12
4.3.1.8	Ask Message	13
4.3.2	Test Exception Status Message	13
4.3.2.1	Using Omit Exception OFF	14
4.3.2.2	Using Omit Exception ON	14

Table of Contents		Page
4.4	Test Operation Controls	15
4.4.1	Start Test Controls	15
4.4.2	Stop Test Controls	16
4.4.3	Joy Stick Control	16
4.5	Selecting Your Test Setup	17
4.5.1	Test Setup Menu	17
4.5.1.1	Creating New Test Setup	18
4.5.1.2	Opening a Test Setup	18
4.5.1.3	Creating a Test Setup Template	19
4.5.1.4	Deleting a Test Setup	19
4.5.1.5	Editing a Test Setup	20
4.5.1.6	Copying a Test Setup	21
4.5.1.7	Renaming a Test Setup	22
4.6	Performing a Test Run	23
4.6.1	Pre-Run Procedure	23
4.6.1.1	Manual Zero	24
4.6.1.2	Set Home	24
4.6.2	Start a Run	25
4.6.3	Stop a Run	25

## 4.0 Performing an L2 Plus Test

### 4.1 L2 Plus Test Modes of Operation

Your L2 Plus advanced force measurement system has two modes of operation: standard and height. The default operating mode is standard mode. Both operating modes are discussed in detail in the following paragraphs.



*Shows system in Standard (Normal) mode*

#### 4.1.1 Standard Operating Modes

Most L2 Plus applications will operate in standard mode. Standard mode is also referred to as “normal mode”.

Standard mode means that the measurements are taken from your Home position. From Home where the test sequence begins, load, distance, stress and strain are measured.

Standard mode measures distance (D) and load (L) for the test steps used in your test setup. Your test steps will typically go to a load or to a distance at a specified crosshead velocity.

In all standard mode L2 Plus test setups, you define your test sequence using Load and Distance. In the Controller view, L2 Plus software displays the load (L) and distance (D) for each test setup. When (D) is displayed, the system is in standard operation mode, also called normal mode.

You can also tell if the system is in standard mode by looking at the test mode symbol in the header tool bar. When the crosshead is located mid-level showing two opposing arrows, the system is in standard mode.



**NOTE**

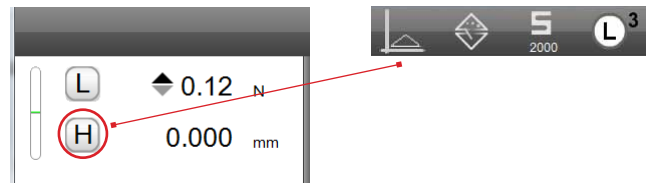
When you create your test setup, you must be in the mode you intended to perform the test in. You cannot create a test when the system is in Height mode (H) and then perform the test in standard mode (D).

#### 4.1.2 Height Operating Mode

Height mode is used when it is important to measure results based on the sample’s height or its change in height when a load is applied. A compression spring is an example where the height of the spring is important in order to determine the spring rate of the spring. In this application, load is applied and the load at individual setpoints based on height are measured and recorded.

When your L2 Plus system uses height mode, you place the system into height mode by selecting the mode symbol. When in height mode, you will also see the Distance (D) indicator change to (H) representing the measured height during the test run.

When using Height mode, the L2 Plus system must perform a datum pre-test function. The datum must be established in order for the system to be able to measure the height.



*Shows system in Height mode*

### 4.1.2.1 Setting Datum

Setting the datum establishes a reference zero height position. Your sample's length/height is measured based on your established datum. The datum may be established for either tensile or compressive testing. An automatic datuming procedure is included with the spring test software.

#### Tensile Datuming

Once you have affixed your testing fixtures, use the jog targets to position the top fixture as close as possible to the bottom fixture.

There are two ways you can determine the sample's free length:

1. If you know the sample's length from measuring with a caliper or micrometer, you can enter that value into the text block. This value represents the height of the sample and used to determine the datum.
2. Or, you can place the sample into the test fixture. Use the jog key to extend the crosshead upward until a very slight load is displayed on the Controller view. Then press the jog key down to remove all load.

Next, press the UP target on the Datum dialog box. The crosshead will automatically move upward at a very slow velocity until a load is detected. Once a load is detected, the height of the sample is known. This height will be used as the basis for all future height measuring in this setup.

#### Compressive Datuming

The automatic datuming feature is used for finding the datum for a compression test.

Begin, by manually positioning the top and bottom fixtures very close to one another, but not touching.



#### CAUTION

Use extreme care and the slowest jog speed when placing the top and bottom fixtures together to avoid overloading your load cell sensor.

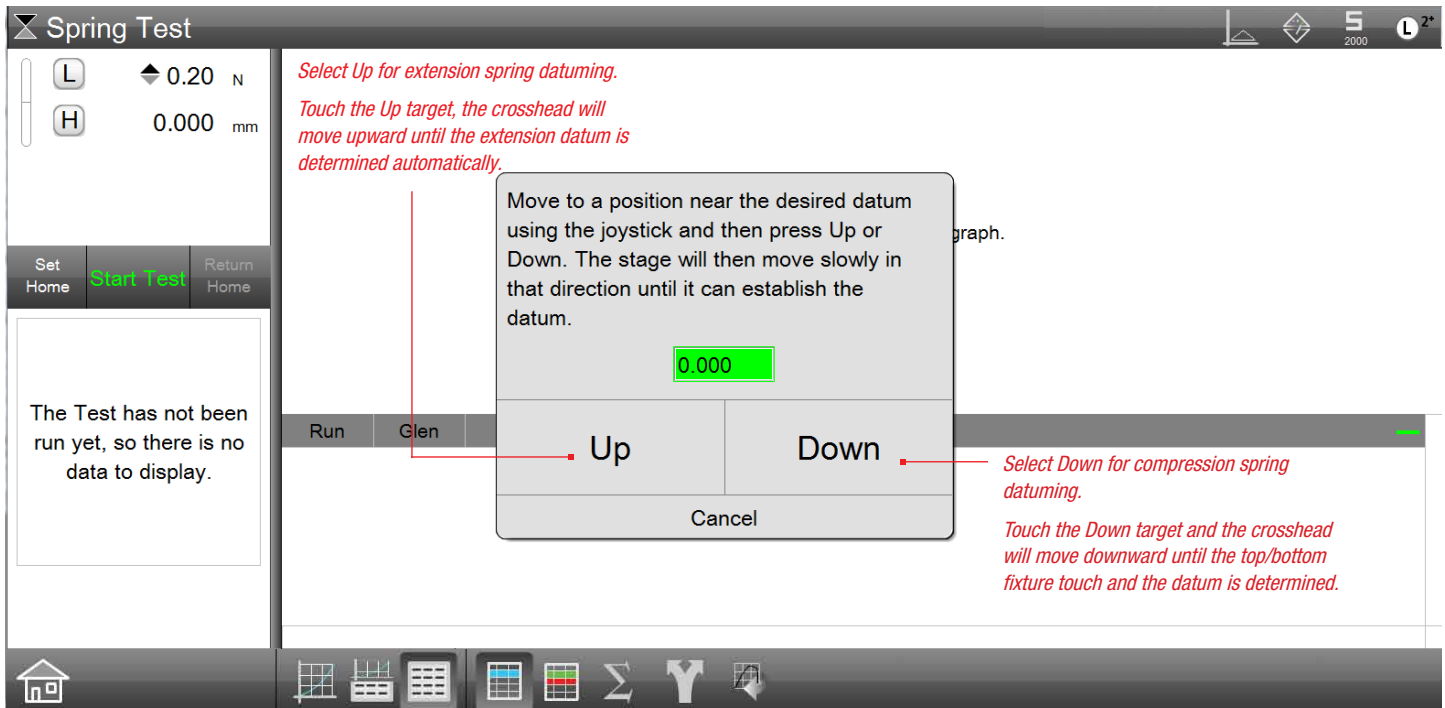
Once the top and bottom fixtures are close together, press the H target on the Controller view. This will cause the crosshead to automatically move until the top and bottom fixtures touch. A slight load, indicating that the top and bottom fixtures have touched will automatically stop crosshead movement. This will establish the datum position.

Next, manually move the crosshead upward so that there is sufficient room between your top and bottom fixture to properly fit your sample for testing.



#### NOTE

You do not need to repeatedly set the datum during a batch. The datum is remembered by the system.



Shows automatic Datum feature dialog

If you select the H target, a message will display asking whether or not to accept the current datum or to re-datum (Set).

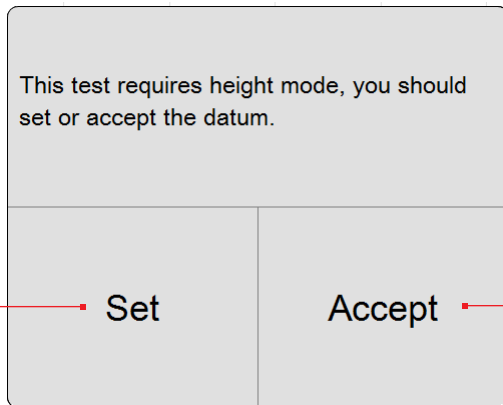
Pressing ACCEPT, will continue with the current datum setting if valid.

Pressing SET, will start a new datum setup. Again, you will manually place the top and bottom fixtures close together.

*Select SET to establish a new datum.*

*This requires that you repeat the automatic datum routine.*

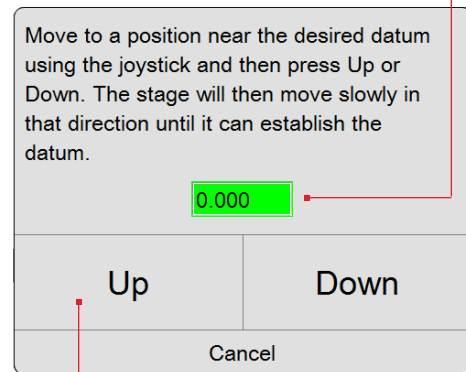
*Select ACCEPT to maintain the existing datum measurement.*



*You can accept the existing Datum or set new one*

*You can enter the Fixture Height or the known length of your extension spring in this entry block.*

*If you set up Fixture Height in the test setup, this height value is automatically populated and used to determine the datum.*



*Enter known Height for Tensile direction*

*Select Up for extension (tension) spring datuming.*

*Touch the Up target and the crosshead will move upward until a light load is detected. The height is determined based on this "first touch load".*

## 4.2 L2 Plus Status Indicators

The Start/Stop push button on the L2 Plus test frame features an LED indicator. This LED will display different colors showing the status of the test system and whether or not a test is active. The LED status colors are as follows:

LED Color	Status
None	System is inactive. Frame not communicating with L2 Plus software.
Green - Solid	System is active. Ready to test with L2 Plus software.
Green - Flashing	System is active. A test run is active.
Yellow - Flashing	Test run is active, but in a paused state.
Red - Solid	System is active on power up.
Red - Flashing	Test is stopped.

*L2 Plus Test Status Indicators*

### 4.2.1 Test Mode Indicator

The L target is used to display the applied load and to zero the load value. The D target is used to display displacement or distance. The D displays the amount of crosshead movement as measured by the encoder.

#### Load-Distance Test Mode

When in Load-Distance mode, your graph views are Load x Distance (LxD), Load x Time (LxT) and Distance x Time (DxT).

If the system is in Height mode, the D target is replaced by an H target. The H target indicated Height mode and the value next to the H target is the measured height from the datum.



*Start/Stop push button with LED. Current test status is displayed using the LED indicator.*

*The bargraph indicates the measured load relative to the load cell sensor's rated capacity.*

*Displays the active load measured by the load cell sensor.*

*Displays the active distance measured by the encoder.*

**My Tensile Test**

L 0.11 N

D 0.000 mm

Set Home **Start Test** Return Home

L<sub>max</sub> 142.57 N

D<sub>@lmax</sub> 7.137 mm

L<sub>min</sub> 123.50 N

D<sub>@lmin</sub> 12.077 mm

L<sub>brk</sub> 217.09 N

D<sub>@lbrk</sub> 19.839 mm

The Test has finished running!

*L2 Plus Controller view*

### 4.2.2 Load Bargraph

The Controller view displays the current applied load being measured by the load cell sensor. The load is displayed from the center of the bargraph. When the bargraph is filled from the center upward, tensile load is being applied. When the bargraph is filled from the center downward, compressive load is being applied.

The bargraph displays green when the measured load is within 80% of the load cell sensor's full scale capacity.

The bargraph displays yellow when the measured load is within 81% - 95% of the load cell sensor's full scale capacity.

The bargraph displays red when the measured load exceeds 95% of the load cell sensor's full scale capacity.

Color indication is used to represent the measured load versus the load sensor's capacity as follows:

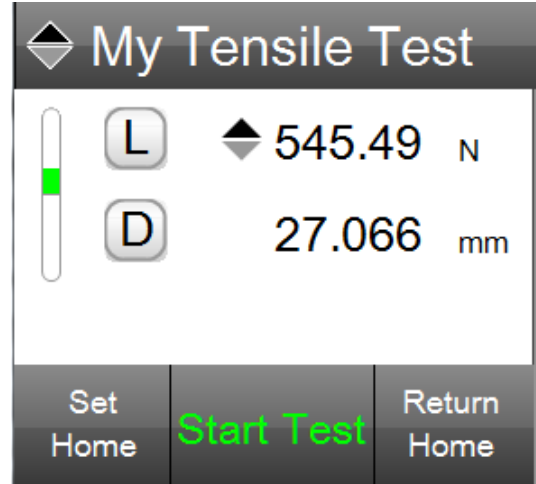
Bargraph Color	Load Indication
GREEN	The sensor is operating within its normal range 0 to 80% of full scale capacity.
YELLOW	The sensor is operating in its caution range 81 to 95% of full scale capacity.
RED	The sensor is operating in its high range 96% and above. Be alert of the measured load overloading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

*Load Sensor Status Indication*

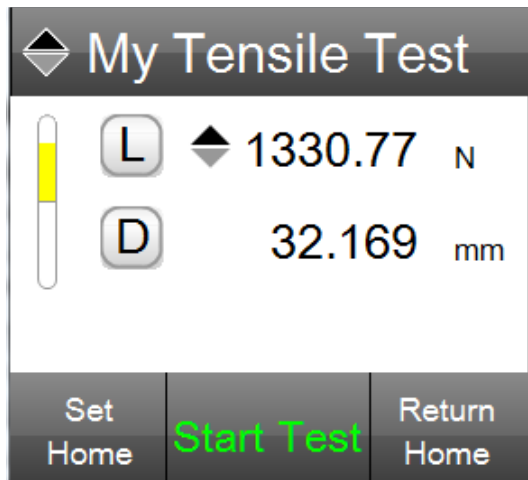


**CAUTION**

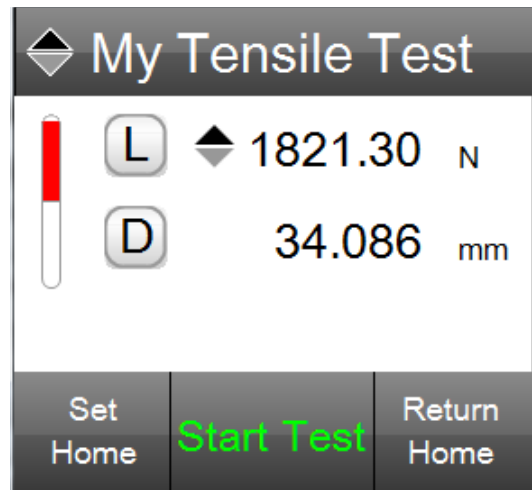
When the bargraph displays in red, it indicates that the load cell is nearing its full scale capacity and that it is near an overload condition. USE EXTREME CAUTION NOT TO EXCEED THE LOAD CELL'S FULL SCALE CAPACITY.



*Normal Operating Run  
Bargraph displays green- load cell sensor in normal range*



*Caution Operating Run  
Bargraph displays yellow- load cell sensor in caution range*



*Warning Operating Run  
Bargraph displays red- load cell sensor in warning range*



### 4.2.3 Measured Load Indicator

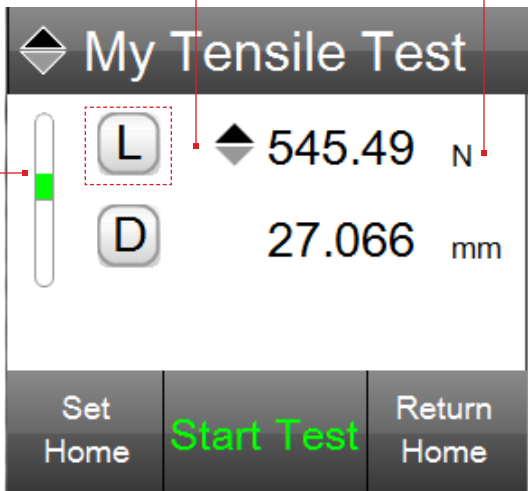
The L target in the Controller view is used to tare or zero the measured load. The numeric value next to the L target is the currently measured load, being measured by the attached load cell sensor.

The units of measure are displayed after the measured value.

*Bargraph displays "upward" indicating measured load is tensile direction.*

*Arrow also displays upward (tensile).*

*Actual load is "positive" integer for tension. Shown with specified units of measure (Newtons).*

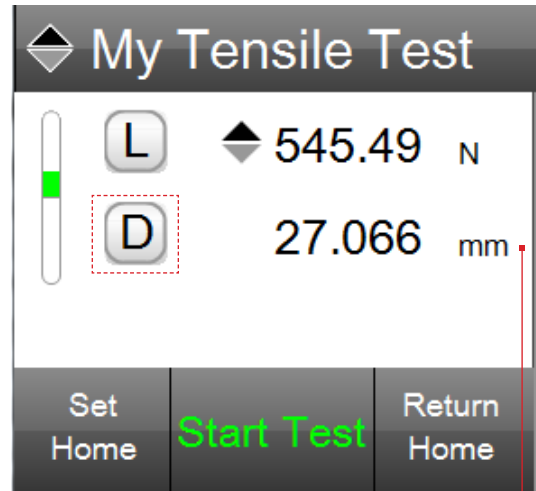


*Select L to zero/tare the load cell sensor*

### 4.2.4 Measured Distance Indicator

The D target in the Controller view is used to tare or zero the measured displacement (distance). The numeric value next to the D target is the currently measured load, being measured by the frame's internal encoder.

The units of measure are displayed after the measured value.



*Select D to zero the distance (Home)*

*Displays the total travel from the Home (Start) position for the test run.*

*Distance is using millimeters (mm) as the unit of measure for distance.*

### 4.2.5 Test/Step Velocity Indicator

During a test run, the crosshead's current velocity is displayed with the units of measure for speed.

*During each test step, the crosshead velocity is displayed in both the main Controller view and in the Step Message box (bottom).*

**My Tensile Test**

L 195.26 N

D 34.134 mm (4.000 mm limit)

Speed 25.000 mm/min

**Stop Test**

Results for last run

- L<sub>max</sub> 460.75 N
- D<sub>@lmax</sub> 7.199 mm
- L<sub>min</sub> 351.68 N
- D<sub>@lmin</sub> 14.985 mm
- L<sub>brk</sub> 457.74 N
- D<sub>@lbrk</sub> 8.759 mm

Step Direction: Pull, D<sub>lim</sub> = 4.000 mm, S = 25.000 mm/min

*Active crosshead speed  
Velocity displayed during a test step*

### 4.3 L2 Plus Status Messages

During a test, the L2 Plus software displays a status message in the message box area. The status message will generally advise the user of the current test step being performed and key step parameters for that step. Certain messages, such as Ask messages, require the user to enter information before the test step can continue.

#### 4.3.1 Step Messages

Test setups are made up of a series of test steps. During a test run, your L2 Plus Series software displays step messages that alert the user to the current step being performed. These messages are described in the following sections.

**My Tensile Test**

- Pre Test (1)
- Pull (2)** D<sub>lim</sub> = 4.000 mm, S = 25.000 mm/min
- Pull (3) Brk = 50.0 %, S = 50.000 mm/min
- Data (4) L<sub>max</sub>, D<sub>@lmax</sub>, T<sub>@lmax</sub>, L<sub>min</sub>, D<sub>@lmin</sub>
- Post Test (5)

*Test Setup for My Tensile Test  
Step 2 is being performed*

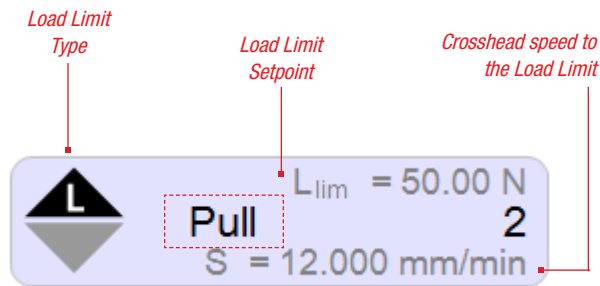
*A Step message is displayed for each test step in the test setup. Included is the Step Number and the key step parameters, e.g. Limit, Direction, Speed.*

*Step Number*

### 4.3.1.1 Load Limit Step Message

Load Limit steps are available for either tensile or compressive test steps. The Load Limit step moves the crosshead until a load limit or load setpoint established for this step is achieved.

The Load Limit step message will tell you the step number, the direction of crosshead motion, the limit setpoint and the velocity to this step.

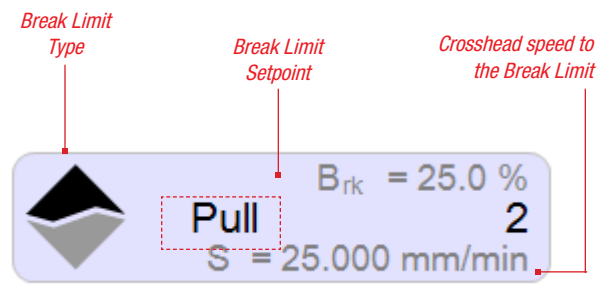


Load Limit Step Message

### 4.3.1.3 Break Message

Break steps are available for either tensile or compressive test steps. The Break step moves the crosshead until a break limit, defined as a percentage drop in load after a maximum load is reached, is achieved.

The Break step message will tell you the step number, the direction of crosshead motion, the break setpoint and the velocity to this step.

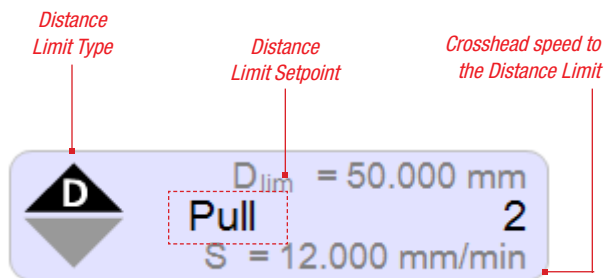


Break Limit Step Message

### 4.3.1.2 Distance Limit Step Message

Distance Limit steps are available for either tensile or compressive test steps. The Distance Limit step moves the crosshead until a distance limit or distance setpoint established for this step is achieved.

The Distance Limit step message will tell you the step number, the direction of crosshead motion, the limit setpoint and the velocity to this step.

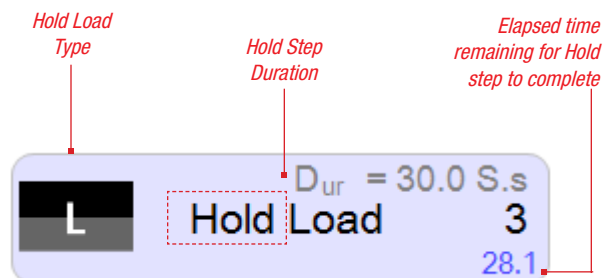


Distance Limit Step Message

### 4.3.1.4 Hold Message

Hold steps are available for either load or distance test steps. The Hold step holds the crosshead at a previous step's load or distance limit for a specified time duration.

The Hold step message will tell you the step number, the hold type (load or distance), and the hold duration to the end of the hold step.

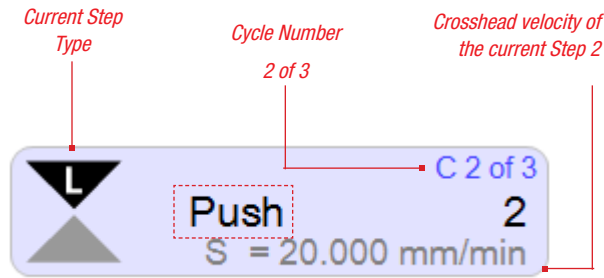


Hold Step Message

### 4.3.1.5 Cycle Count Message

A Cycle Count step is used to cycle steps in a series. You specify the step numbers you want to cycle and using a count, you specify the number of times this series of steps should be repeated.

The Cycle Count step message will tell you the count number of your cycle series.

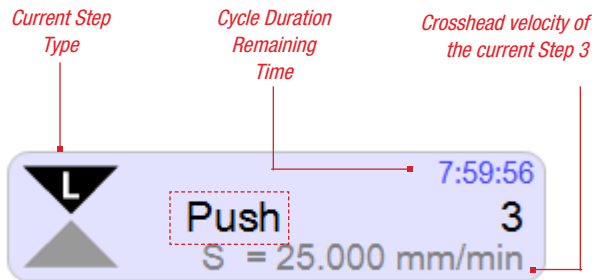


Cycle Count Step Message

### 4.3.1.6 Cycle Duration Message

A Cycle Duration step is used to cycle steps in a series. You specify the step numbers you want to cycle and using a time duration you specify the time duration this series of steps should be repeated.

The Cycle Time step message will tell you the time remaining for your cycle series. When the time expires, the test setup will move to the next step.



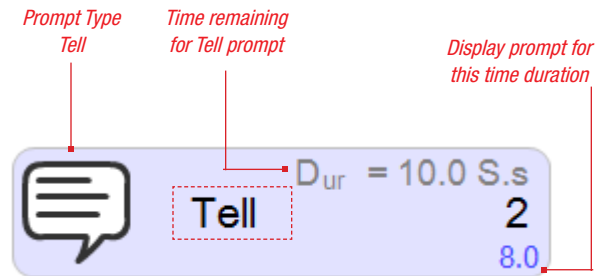
Cycle Duration Step Message

### 4.3.1.7 Prompt Message

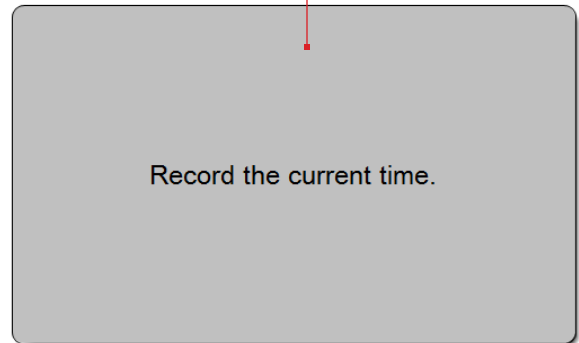
Prompt messages are useful to inform the test operator of important information regarding the test or the current step within a test. Prompts are simply messages that require no operator response and are used to inform the operator.

A Prompt message requires a time duration.

A Prompt message may be up to 100 characters in length.



The prompt, which advises the operator, is displayed on the main graph view for the time duration specified. The operator can extinguish the prompt by selecting this marker.

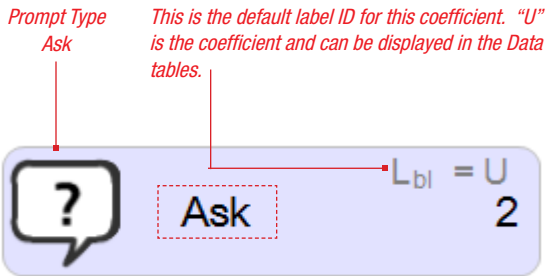


Tell Step Message  
Requires no operator response

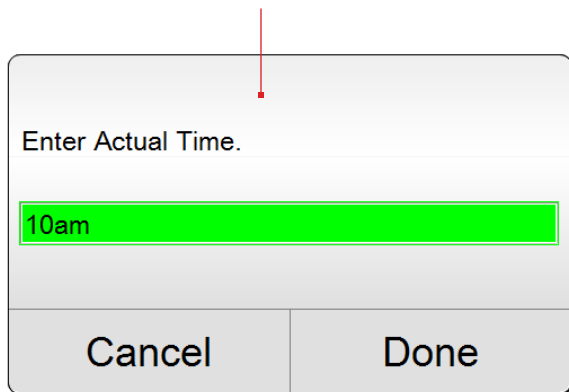
### 4.3.1.8 Ask Message

The Ask message alerts the test operator and requires an answer to the question. Questions should always be short and require a single or few word response. The maximum number of characters, including spaces, for your question is 100.

The response is limited to a maximum number of characters, including spaces, to 40. Use the Ask coefficient to display the answer to your question.



The prompt, which advises the operator, is displayed on the main graph view until the operator enters a response.



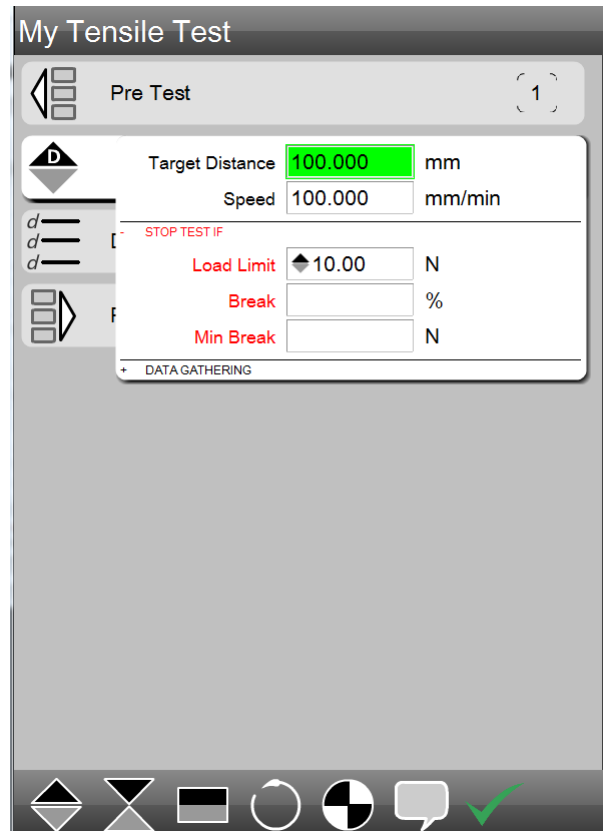
Ask Step Message  
Requires an operator response

### 4.3.2 Test Exception Message

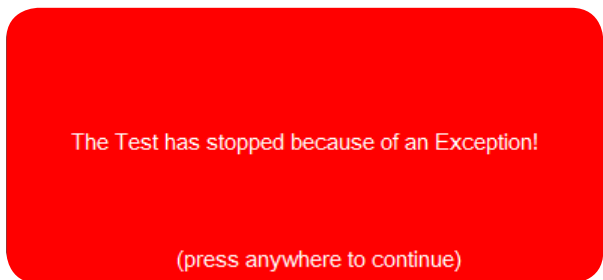
All test step types, except for Prompt, Ask and Datum steps, have a feature called Exception. An exception is best described as an event. If this event occurs during the step, then tell L2 Plus what to do next.

The exception feature is labeled "Stop Test If".

The exception default is Off.



Exception Limit  
Stops test automatically if Load gets to 100N



Exception Message  
When Pre Test Omit Exception = Yes, a message appears and test run stops

### 4.3.2.1 Using Omit Exception - No

You specify whether or not to omit an exception in the Pre Test Step of your test setup.

The Omit Exception default is Yes.

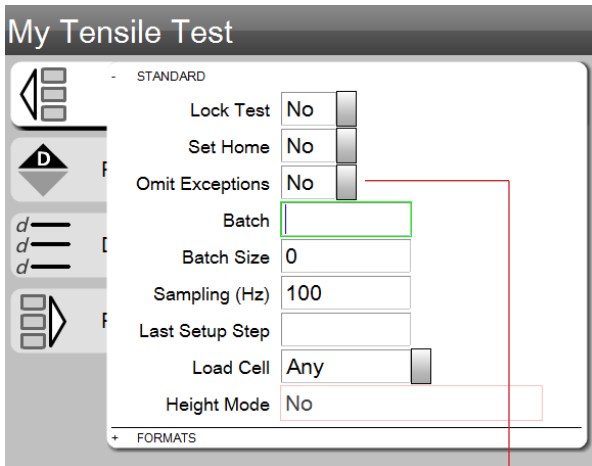
When Omit Exception is set to No, if an exception occurs, the test run will automatically end at the exception. The data for the test is available for analysis.

### 4.3.2.2 Using Omit Exception - Yes

When the Omit Exception option is set to Yes, if an exception occurs, the test run will automatically end. A message is displayed indicating that the test run was ended due to an exception.

Any results in the Results view are depicted with a red x-out over the entire results area. Additionally, the run in the Runs List is shown in red with a red strike-through indicated an aborted test caused by an exception.

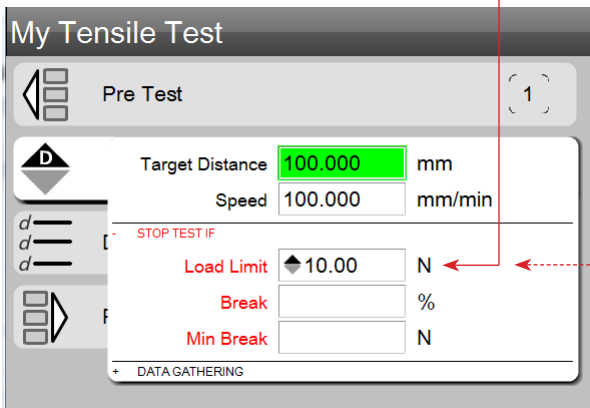
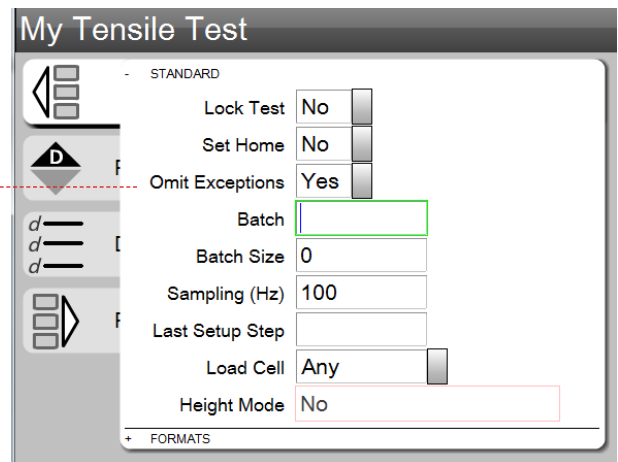
When Omit Exception = Yes, you are omitting the data from this run, e.g. no data is collected for analysis. This test run is voided.



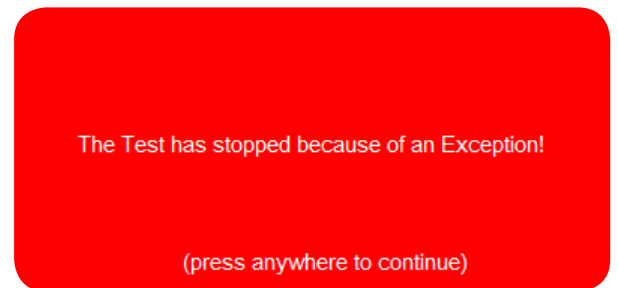
*Pre Test Omit Exception = No  
If an exception is reached, save data for analysis*

*With this test setup, if a test run should measure a load of 10N BEFORE reaching the Target Distance of 100mm, the test will automatically stop.*

*The data acquired up to the 10N will be saved for analysis because Omit Exception = No, e.g. do not omit exception data.*



*Exception Limit  
Stops test automatically if Load gets to 100N*



*Exception Message  
When Pre Test Omit Exception = Yes, a message appears and test run stops*

## 4.4 Test Operation Controls

Starrett recommends using the Start/Stop push button for operating a test. Alternatively, you may use the touch targets on the Controller view.



Start/Stop Test Push Button  
Located next to jog switch

### 4.4.1 Start Test Control

When the test setup is launched, you may proceed to start the test run. Prior to starting a test run, make sure your sample is secured in the test fixture.

If you have not configured automatic Home and automatic zeroing in your test setup, you should perform the following sequence prior to selecting Start:

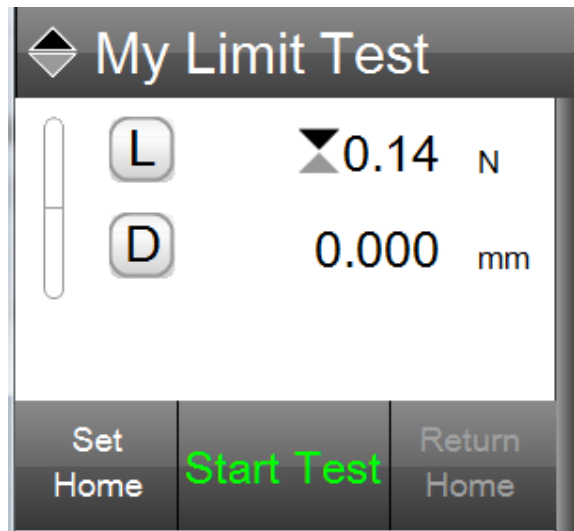
1. Select L target to zero Load;
2. Select D target to zero Displacement;
3. Select SELECT HOME target to establish your home position.

Once these pre-test run functions are completed, you may now press the Start/Stop push button or the START TEST target.



#### NOTE

Start a test using the Start/Stop push button or by selecting the START TEST target on the Controller view.



Start Target  
Press to begin a test run

## 4.4.2 Stop Test Control

During a test run, you may stop the run by selecting the Start/Stop push button or the STOP TEST target on the Controller view.

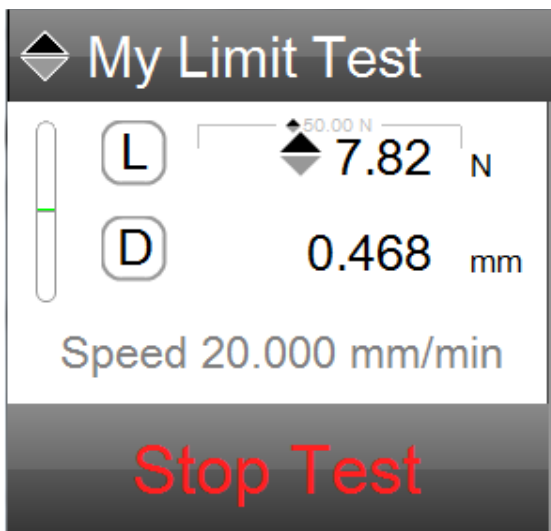
When a test run is stopped, it completes the run. You cannot resume a stopped test



**NOTE**  
Pressing the Stop function ends the current test run.



**NOTE**  
A stopped test run cannot be resumed.



Stop Target  
Press to stop a test run



**WARNING**  
Attempting to stop the crosshead movement during a rapid velocity will lead to a load cell overload condition. This can permanently damage the load cell and associated fixture. Use extreme caution when using high velocities.

*Shows pointer to the left (SLOW). Pressing the joy stick will move crosshead slowly.*



*Shows pointer to the right (NORMAL). This is the normal speed mode. If you press and hold joy stick, the velocity will increase.*



Joy Stick  
Change manual crosshead velocity

## 4.4.3 Joy Stick Control

The joy stick should be used to position the sample and load string prior to the test run. The crosshead velocity will ramp upward when the joy stick is continuously pressed.

Pressing the top portion of the joy stick causes the crosshead to move upward (tensile direction).

Pressing the bottom portion of the joy stick causes the crosshead to move downward (compression direction).



**NOTE**  
Never press the joy stick during an active test run.



**NOTE**  
The joy stick should be used to manual position the sample and load string at a home position.



Joy Stick  
Located next to Start/Stop push button



## 4.5 Selecting a Test Setup

Test setups are saved in the Metlogix/Test directory. Test setups stored in this directory get displayed at the L2 Plus System's Home view.

Test setups may be displayed in the Home view based on their alphabetical name or by activity. If a number is used in the test name, a numbered test name will be displayed before a test name using alpha characters. For example, a test setup with the name 1AAAA will display before a test name of AAAA when you are listing your test names by name.

You may specify how test setups are listed on your Home view using the Test Settings from the L2 Plus Settings menu. Your test list may be setup to display based on:

- Name
- Last Used



### NOTE

Test names with the first character as a number, will display before a test name with only alpha characters when sorted by Name.

You may save an unlimited number of test setups based on available memory in your L2 Plus workstation. Depending on how your Result view is setup, you may view up to ten (10) test setups when the Controller divider bar is positioned at its maximum top location.

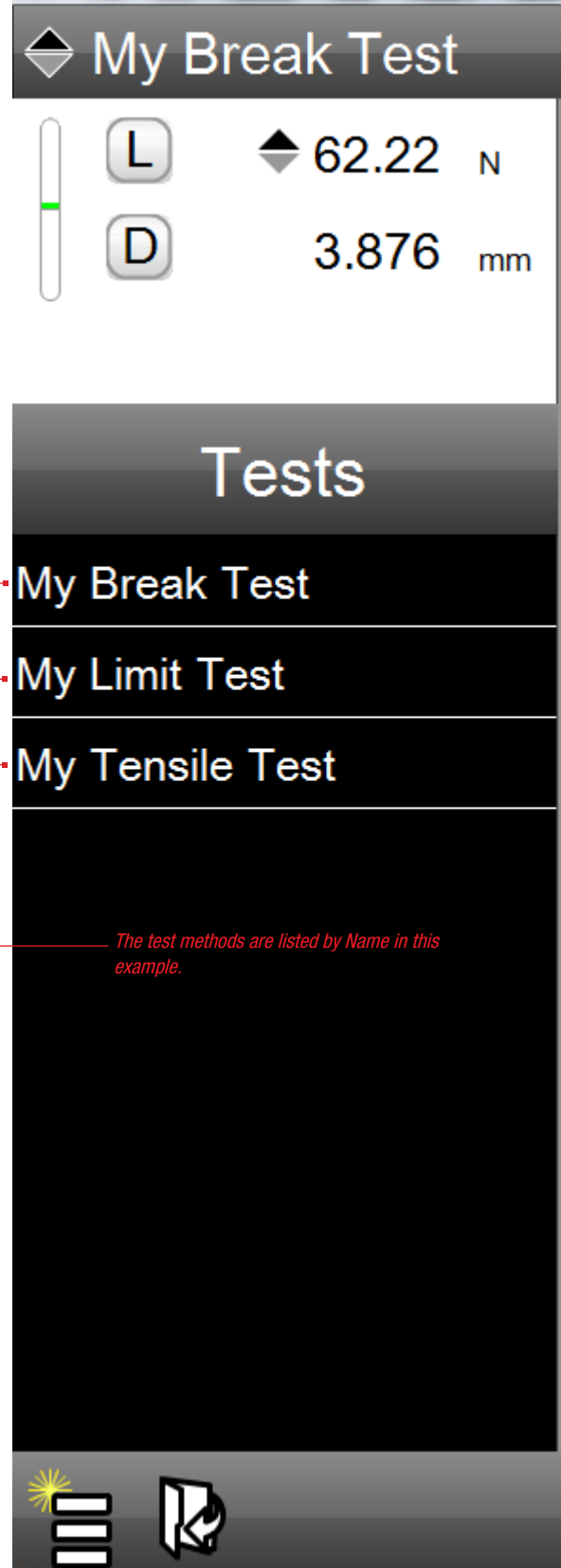


### NOTE

The number of test setups is limited by the memory available on your L2 Plus Workstation. It is possible to have hundreds of test setups saved in your Metlogix/Tests directory.

### 4.5.1 Test Setup Menu

The Home view is where you can setup a new test. You may also open a test setup from the Metlogix/Test directory from the Home view. And if you use templates, you may access the Metlogix/Template directory.



Main Home menu  
Select the test method to perform

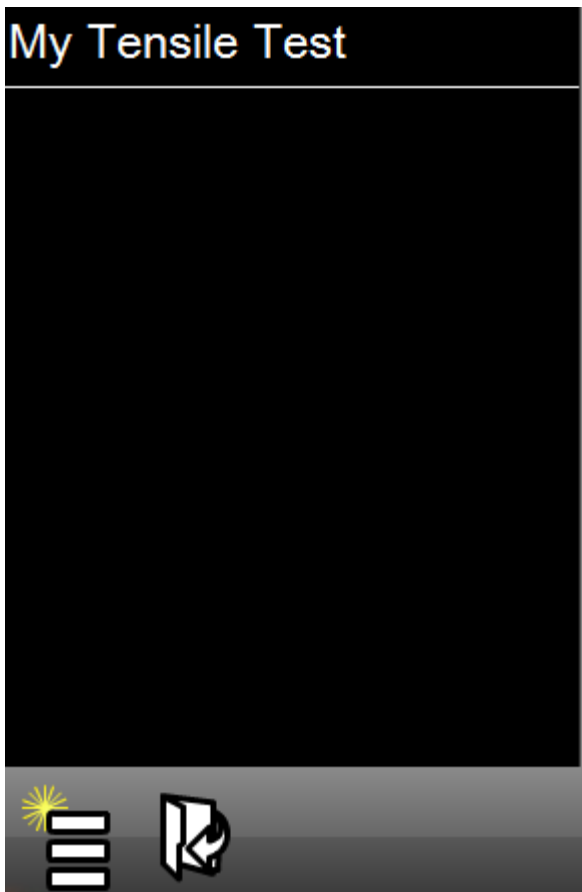
### 4.5.1.1 Creating a New Test Setup

Select the New Test symbol to create a new test setup. When the New Test symbol is selected, L2 Plus Series software opens to the test configuration view. This view shows the major sections that define a test:

- Pre Test section
- Data section
- Post Test section

The symbols at the bottom of the view are the various test step types, including if purchased for your system, additional optional functions such as the functions for logic control using the L2 Plus Automation Builder. When you create the test setup using the test steps, the Test section of your test setup is constructed and appears between Pre Test and Data.

Each of these test sections are described in **Section 3, Creating a Test**.



Main Home menu  
Create New Test symbol

Select the New Test symbol to create a new test method using the L2 Plus Test Builder.

### 4.5.1.2 Opening a Test Setup

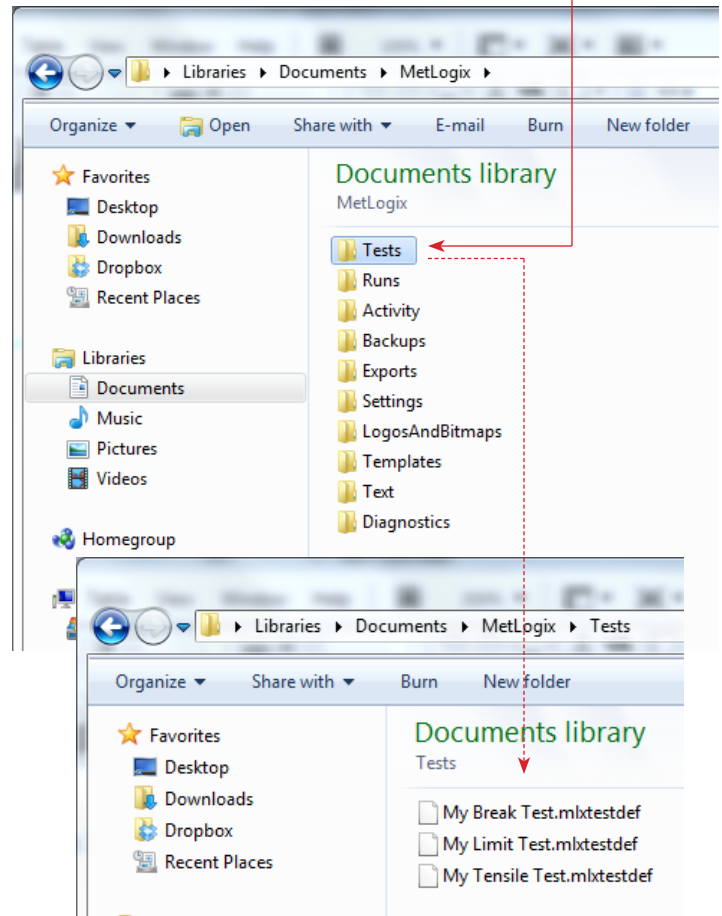
You may open a test setup using the Open Test symbol. This is useful if you have a large number of tests that may be cumbersome to locate in the test directory.

Select the Open Test symbol and L2 Plus Series software opens the Metlogix/Test directory where your actual test setups are stored. Select the test you require from the directory and that setup is launched in your L2 Plus environment.

Select the "Open Test" symbol to open a test or a template using the Metlogix directory



Main Home menu  
Open a Test or Template symbol



Metlogix/Tests Sub-directory  
Shows where test files are stored and saved

### 4.5.1.3 Creating a Test Setup Template

It may be advantageous to create a template on a test setup that may be used often, but on different parts or samples. You can create a test setup using the New Test function. Then move this test from the Metlogix/Test directory to the Metlogix/Template directory. When you select a template, L2 Plus software will open the template you select and you may then create a new test using this template. Tests created using a template must be renamed and “Saved As” and saved to the Metlogix/Tests directory.



#### NOTE

A test template cannot be run. A test template can only be used to construct a new test. The new test is then saved to Metlogix/Tests or to a designated file location on your network.

### 4.5.1.4 Deleting a Test Setup

There are two methods to delete a test setup:

- Delete from Home view
- Delete from Metlogix/Tests directory

You can delete a test setup from the Home view. Select the right side of the test setup panel, then select the delete (X) target. A dialog box is displayed requiring you to acknowledge that you want to delete this test setup.

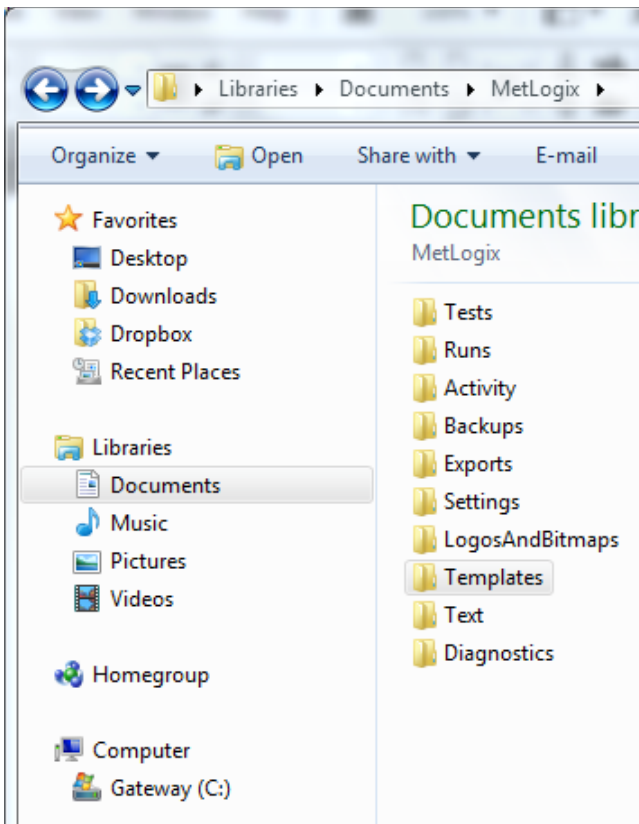
You may also delete a test setup from the Metlogix/Test directory. If you have many test setups, this method is recommended since you can see all of your test setups at one time and sort the test setups by name or date.

To delete, select the test setup and use the delete function on your keyboard.

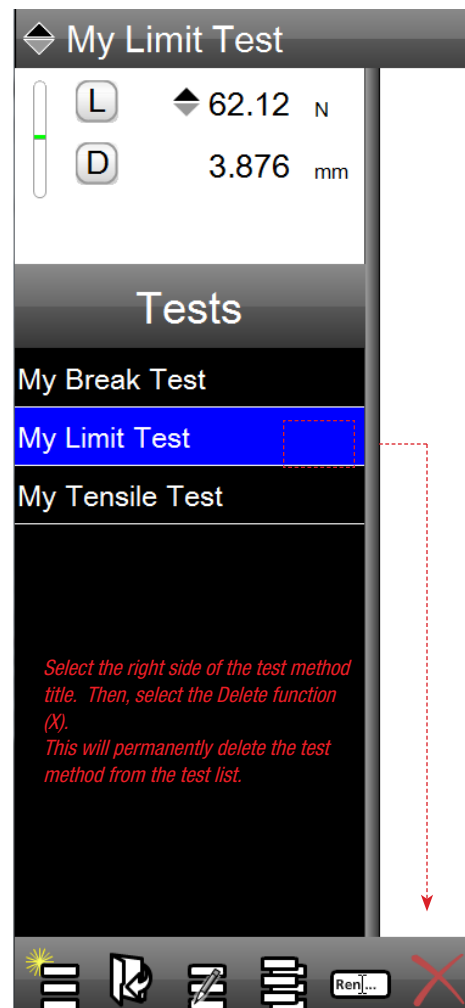


#### CAUTION

There is no acknowledgement required when deleting a test setup using the Metlogix/Test directory.



*Metlogix/Template Sub-directory  
Create and save a test method template for creating new test setups*



*Select the right side of the test method title. Then, select the Delete function (X). This will permanently delete the test method from the test list.*

*Metlogix/Template Sub-directory  
Create and save a test method template for creating new test setups*

### 4.5.1.5 Editing a Test Setup

A test setup may be edited provided the user has appropriate security authorization to revise a test.

Select the test setup and select the right side of the panel. Then select the Edit function.

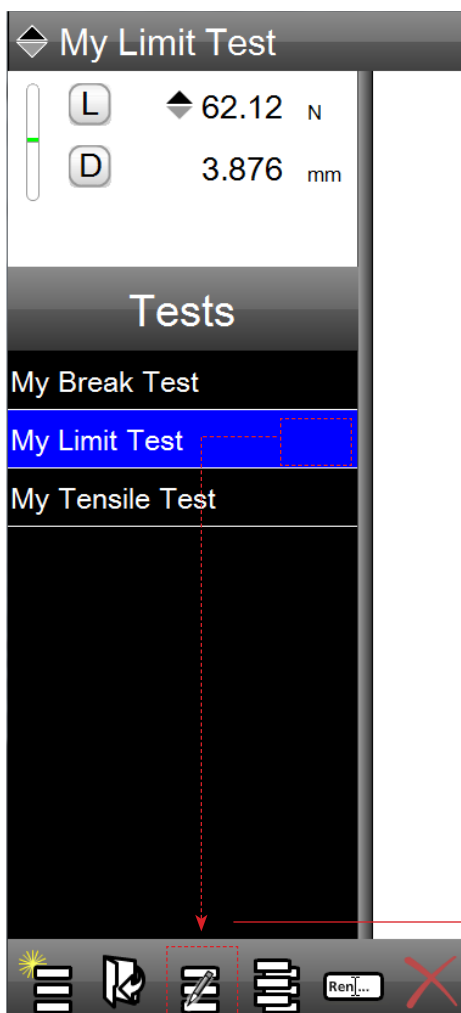
The test setup will open with the Test section showing the various steps used in the test setup. You may then revise, add or remove steps to the test section. You may also modify the Pre Test, Data or Post Test sections.

After your changes are made, a dialog box will display asking you to save and acknowledge the revisions to the test setup.



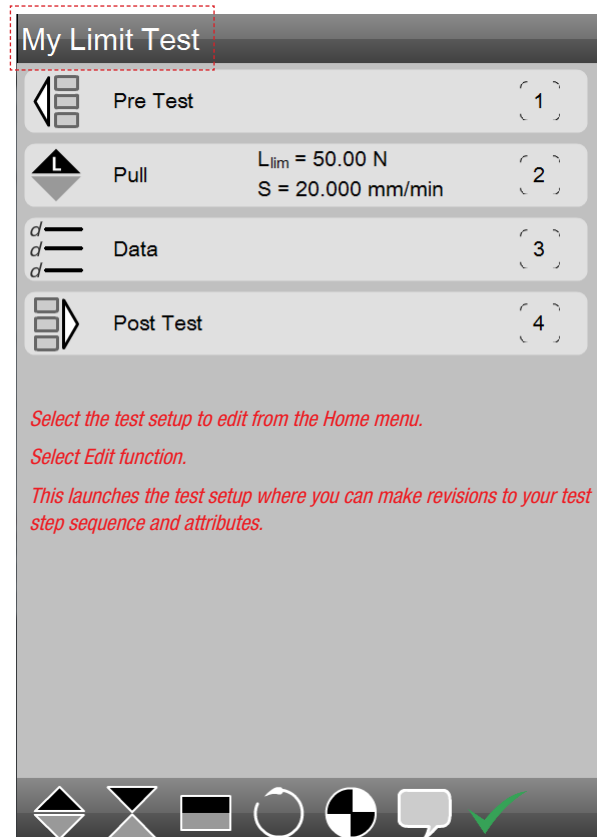
**NOTE**

Changing the test setup may affect results, including making some results invalid. Invalid or out-of-range results are displayed with an XXXXX in the marker, Result view or in the columns in the Data views.



Home Test Menu

Select Edit function to edit the specified test setup



Select the test setup to edit from the Home menu.

Select Edit function.

This launches the test setup where you can make revisions to your test step sequence and attributes.

My Limit Test Test Setup  
Selecting Edit opens test setup for selected test

### 4.5.1.6 Copying a Test Setup

A test setup may be copied using two methods:

- Use the copy function at the Home view
- Copy the test from within the Metlogix/Tests directory

You can copy a test setup from the Home view by first selecting the test setup from your list. Then select the Copy function.

The test setup will open as a NEW TEST with the Test section showing the various steps used in the test setup. You may then revise, add or remove steps to the test section. You may also modify the Pre Test, Data or Post Test sections.

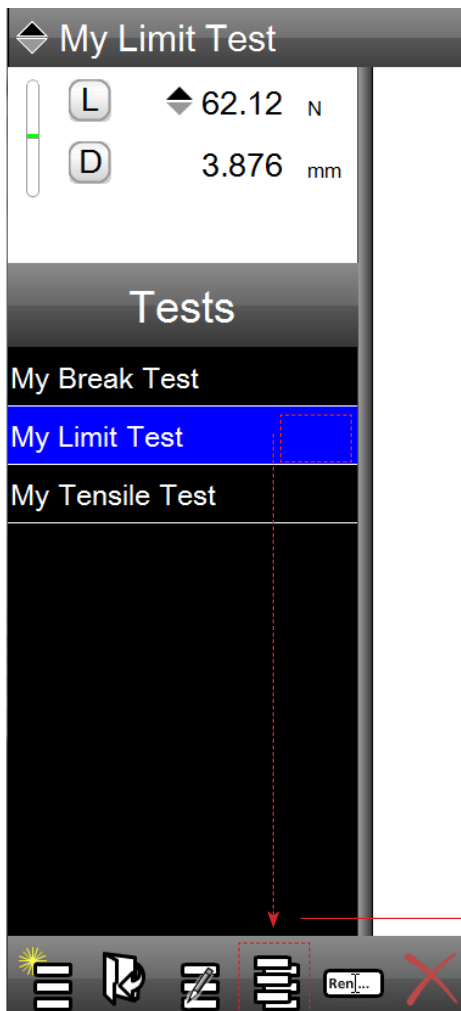
After your changes are made, a dialog box will display asking you to Name and save the test setup.

You may also copy a test from the Metlogix/Tests directory. Select the test from the list and use Window's copying methods, e.g. right mouse to copy the test setup. Rename the test setup again using standard Window's methods, e.g. highlight name and re-enter new name.

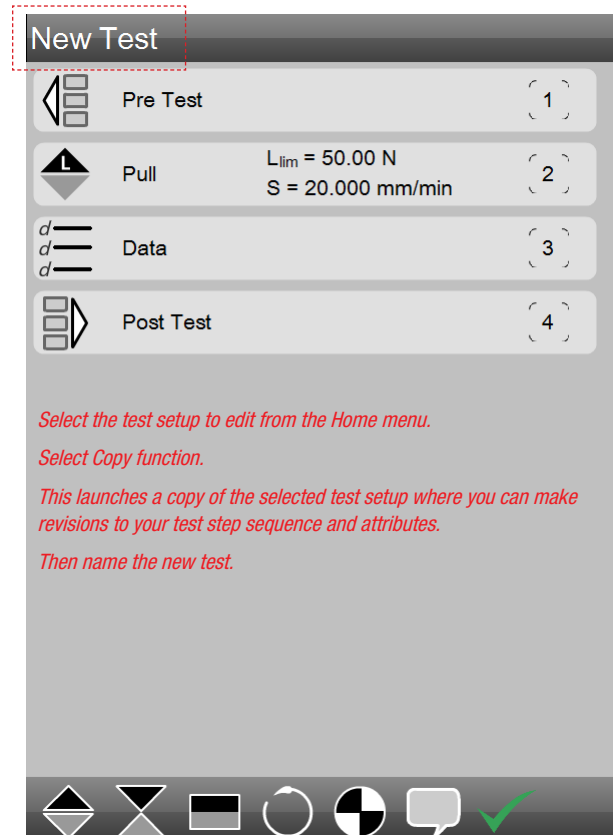


#### NOTE

Creating a new test setup using the Copy function may affect results, including making some results invalid. Invalid or out-of-range results are displayed with an XXXXX in the marker, Result view or in the columns in the Data views.



Home Test Menu  
Select Copy function to create a copy of the specified test setup



A copy of My Limit Test Test Setup  
Selecting Copy opens test setup as a New Test for editing

### 4.5.1.7 Renaming a Test Setup

You have two methods for renaming a test setup:

- Rename from Home view
- Rename from Metlogix/Tests directory

To rename a test setup from the Home view, select the test setup. Select the Rename function. The test setup name will highlight and you can then enter a new name for your test setup.

You may also rename a test using the Metlogix/Tests directory. Select the test setup from the list and using Window's naming methods, rename the test setup. The new name will be reflected when you view the test setup at the Home view.



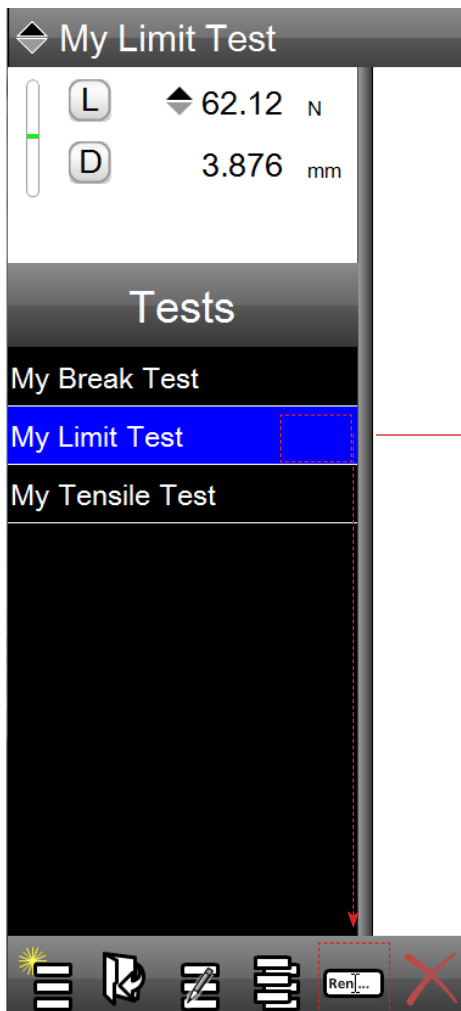
**NOTE**

Test setup names may be up to 16 characters in length.



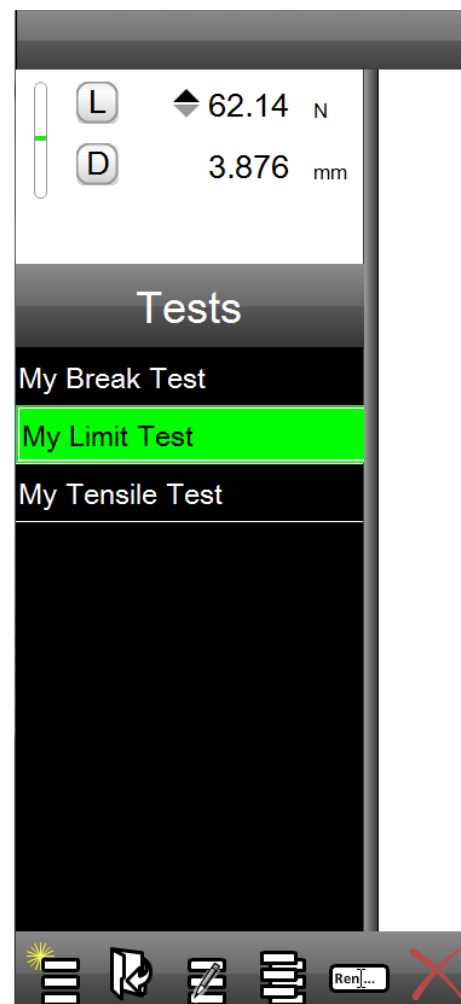
**NOTE**

If your L2 Plus system will contain a large number of test setups, take care to use a naming convention that will allow fast lookup of your test setup.



*Home Test Menu*

*Select Rename function to rename the specified test setup*



*Enter the new name for the selected test setup*

## 4.6 Performing a Test Run

Once a test setup is launched, you may then proceed to perform a test run. A test run is an actual test of a single sample. Once a run is performed it is registered in the Runs List for that test setup and it is saved to the Metlogix/Runs directory.

Test runs are listed numerically. Every test run has a unique test number. If a test run is deleted, the sequence of the test runs in the Runs List is maintained.

For example, if you delete run #3 after performing five (5) runs, the Runs List will display 1,2,4,5. Run #3 is forever removed from the Runs List. This ensures that anyone looking at the Runs List can see that a run was deleted.

Runs that ended due to an exception event, when the Omit Exception function is Yes (Pre Test), will appear in red text with a strike-thru.

Runs that make use of a tolerance, and that contain a result that is out-of-tolerance will appear in red text.

All other runs will appear in black text.

When a Batch Name is used, the Batch Name will appear atop the Runs Number in the Runs List. A Batch Name may be setup in the Pre Test section of your test setup.

When multiple runs are displayed together, a color-coded dot appears next to the run. This color designates the graph trace when multiple traces are displayed together. The active trace always appears with a black trace. When you use the split view with graph and data together, the black color identifies the test run that the data belongs to.

### 4.6.1 Pre-Run Procedure

The following represent some common “pre-run” checks that should be done prior to performing a test run:

- Start/Stop push button should display green.
- The sample is secure and axially aligned in the test fixture.
- Test fixtures are properly secured with tightened locking rings and Starrett grip pins.
- The correct test setup is open and ready to be used.
- The load cell sensor is communicating and displaying its full scale capacity beneath the load cell status icon.
- The tester is configured for the proper test mode, e.g. normal mode or height mode depending on the test setup.
- The H target is displayed when height mode is used
- The D target is used when normal mode is used.
- The correct units of measure are displayed for Load and Distance.
- The correct graph options are displayed for the type of testing to be performed, e.g. load-distance.
- If a splinter shield is used, the door on the shield is completely closed so that the interlock is enabled.
- Travel limits are set to prevent over-travel conditions that can lead to a load cell overload condition.
- Access to the Emergency stop is easily and quickly accessible to the user.
- Access to the power switch to the frame, located on the back panel, is easily and quickly accessible to the user.



#### WARNING

Operating the system carelessly could result in serious injury or death. Keep hands, head and all other body parts away from the testing space when the crosshead is in motion.



#### WARNING

Moving parts can produce dangerous forces corresponding to the system capacity. All operators should read the instruction manual thoroughly to ensure they operate the system correctly. Control access to the system to ensure only trained operators operate the system.



#### WARNING

Keep the face and body away from the test specimen during tests. When the specimen breaks, flying debris could injure eyes or other body parts. Always use a safety guard or other measure to provide protection from broken specimens.

### 4.6.1.1 Manual Zero

The Pre Test section has an option called Set Home that will automatically zero the Load and Distance values when the Start Test target or Start push button is pressed to begin a test run.

If the Set Home function is not used (Set Home = No), you must zero the Load and Distance values prior to starting the test run.

- Press the L target to zero Load
- Press the D target to zero Distance

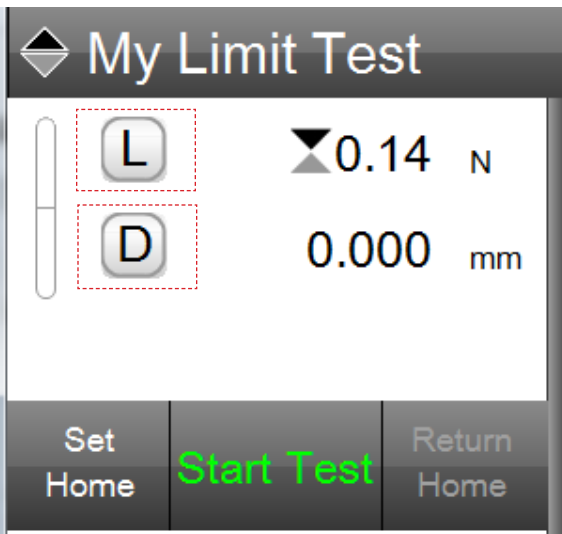
### 4.6.1.2 Set Home

The Home position is critical to successful testing. The Home position is defined as where the test starts from. It is the location used to set your sample into the testing fixture and the location where the software begins measuring load and distance values.

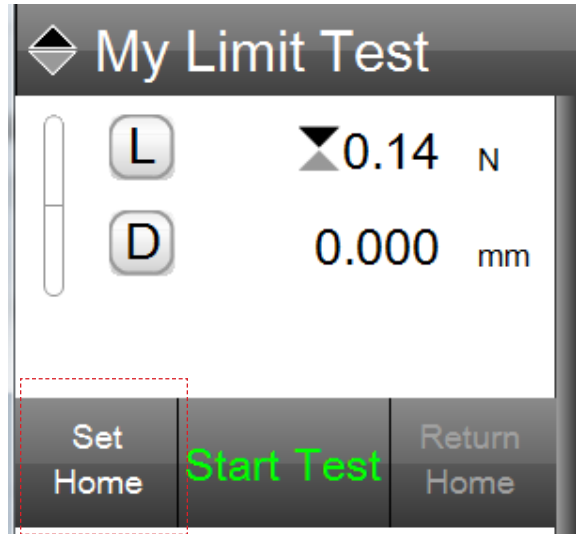
When the Setup Home option in Pre Test is Yes, the Home position is established at the point where the Start Test target or Start push button is pressed.

If the Set Home option is not used in Pre Test = No, the user must manually Set Home by pressing the Set Home target.

Press Set Home after you have zeroed Load (L) and Distance (D).

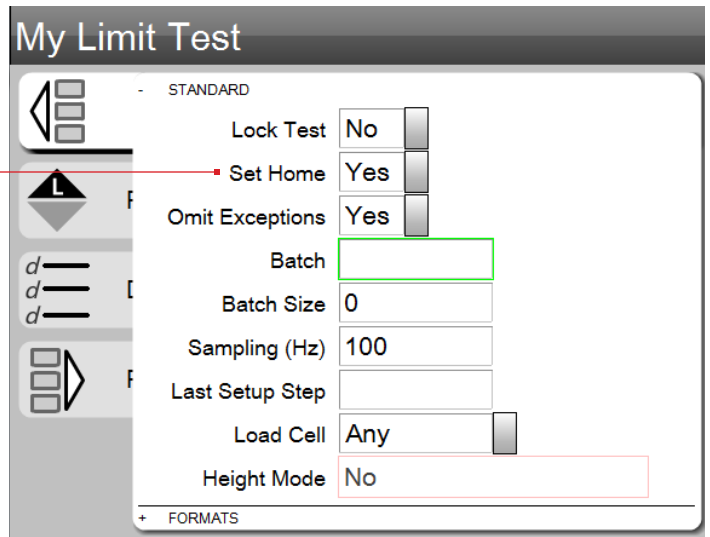


*Zero Load and Distance  
Set prior to Set Home and Start Test*



*Set Home  
This establishes the crosshead start position for all test runs*

*If SET HOME = Yes in your Pre Test step, Home is automatically established at the crosshead location when the Start Test is pressed.*



*Pre Test Set Home  
Home is set automatically when Start is pressed*



## 4.6.2 Start a Run

Select the START TEST target or press the Start/Stop push button on the test frame to begin a test run.



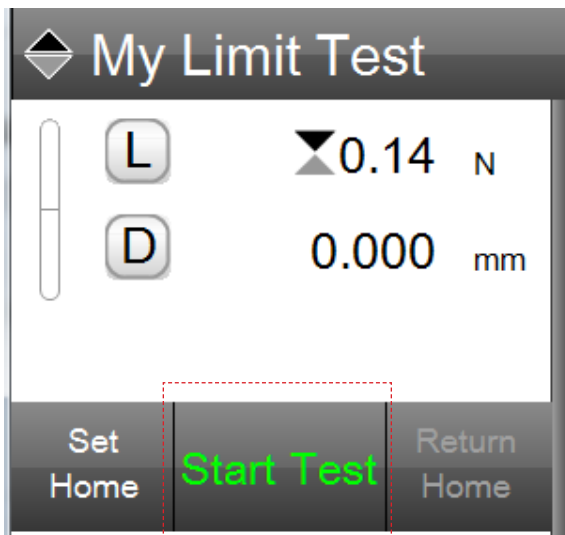
### NOTE

The LED should indicate green prior to you pressing the push button. This indicates ready.



### NOTE

During the test run, the LED will blink green indicating that the test frame is active and that the crosshead is moving.



*Start Target  
Press to begin a test run*

## 4.6.3 Stop a Run

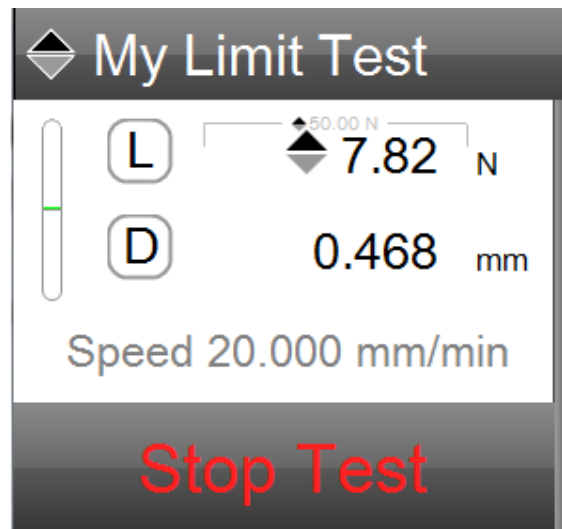
You may stop an active test run by pressing the Start/Stop push button, or by pressing the STOP TEST target on the Controller view.



### NOTE

An active test run will also stop due to the following:

- Emergency stop switch is pressed
- Crosshead travel limit exceeded
- Load cell sensor load limit exceeded
- Exception event occurred



*Stop Target  
Press to stop a test run*



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