Lx Software

Measurement Capabilities and Comparisons

STANDARD & OPTIONAL SOFTWARE	L3	L2 Plus	L2	S2	Comments
Load, Distance and Break Test Templates			S		These are preformatted test setups for inexperienced users.
Compression and Extension Spring Templates				S	These are preformatted test setups specifically for compression and extension spring testing applications.
Test Builder	S	S	S	O	Included in L3, L2 Plus and L2 products. The Test Builder is Optional for S2 and must be ordered separately.
Formula Builder	S				The Formula Builder is supplied standard with L3. It is optional for L2 Plus, L2 and S2 and included as part of the Automation Builder software. The Formula Builder is not as comprehensive for L2/S2 as there is no support for advanced mathematical functions (trigonometric, algebraic, logarithmic) in L2/S2. In L2/S2 you have the ability to Add, Subtract, Multiply and Divide only.
Automation Builder	O	O	O	O	The Automation Builder is optional for all Lx software products.
TARGET USERS & APPLICATIONS	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
High-volume production testing where users are interested primarily in measuring maximum (peak) load.					When applications require fast measurement of common results (peak/max load), and where testing is done in production environments, L2 is a good choice.
Measuring Stress, Strain and Elongation					L3 is the only product that can measure Stress and Strain. Elongation is its truest definition is Strain. However, some will measure the change in length as elongation and therefore it is possible, but not recommended, to measure elongation with L2 Plus and L2 with the optional Automation Builder software
Measuring and analysis of Loads and Distance					When more detailed analysis is required, generally by the Quality technician or Engineer, L2 Plus should be used.
Application-specific measurement of Spring Rate & Constant					When the application is specifically for extension or compression springs, S2 software should be used.
PRIMARY MEASUREMENT METHODS	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
Measure from/using the graph data AFTER the test run.	S	S			Measurement are performed using the graph and analysis tool.
Measure using a LOVs and BEFORE the test run.			S	S	Use the DATA step and select from the LOVs which results you want to measure and display.
UNITS OF MEASUREMENT					
Load (N, kgf, lbf, gf, ozf)	S	S	S	S	All Lx products
Distance (mm, in)	S	S	S	S	All Lx products

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Stress (Mpa, Gpa, N/cm^2, kgf/mm^2, kgf/cm^2, PSI)	S				L3 only
Strain (%)	S				L3 only
Work (J, mJ,kJ, in-lbf)	S	S			L3 and L2 Plus only
Time (Minutes)	S	S	S	S	All Lx products
Adjustable Resolutions (Load, Distance, Stress, Strain, Time)	S	S			L3 and L2 Plus only. Resolutions in Load in L2 and S2 are a function of 10,000:1 per FS load cell capacity
Engineering Notation	S	S			L3 and L2 Plus only
DATA SAMPLING RATE (HZ)	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
5 to 1000 Hz (samples per second)			S	S	All Lx products
1 to 2000 Hz (samples per second)	S	S			L3 and L2 Plus only
TEST STEP TYPES	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
TEST STEP GOTO MOVEMENTS					
Sample Definition	S				L3 product only.
Tensile Goto Load	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Tensile Goto Distance	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Tensile Goto Break	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Compression Goto Load	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Compression Goto Distance	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.

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Compression Goto Break	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Hold @ Load	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Hold @ Distance	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Cycle for Duration	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Cycle for Count	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Loop	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Prompt Tell	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Prompt Ask	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Datum	S	S	S	O	Standard on all Lx products with Test Builder application. S2 is not supplied standard with Test Builder. Test Builder for S2 systems must be ordered separately.
Conditional Logic	O	O	O	O	Requires optional Automation Builder application

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Equation (fx)	S	O	O	O	Requires optional Automation Builder when used with L2 Plus, L2 or S2
SAMPLE PRECONDITIONING STEPS					
Spring Scragging	S	S	S	S	Standard with S2 product for preconditioning sample prior to testing. Scagging can be performed on all other Lx products equipped with the Test Builder using a Cycle step.
Spring Load Set	S	S	S	S	Standard with S2 product for preconditioning sample prior to testing. Load Set can be performed on all other Lx products equipped with the Test Builder using a Hold step.
MEASUREMENT METHODS & TECHNIQUES	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
POINT MEASUREMENTS					
Measure a Stress POINT	S				Only done using L3.
Measure a Strain POINT	S				Only done using L3.
Measure Elongation POINT	S	O	O	O	L3 should be used when Elongation measurement is required. It is possible, but not recommended, to use L2 Plus or L2 to calculate % Elongation. However, these systems MUST be equipped with the optional Automation Builder software to do so.
Measure a Load POINT	S	S	S	O	L3 and L2 Plus use the graph. L2 uses the LOV or scoping. You can measure a Load point using the Test Builder and scoping. The Test Builder application is optional for S2 systems and must be ordered separately.
Measure a Distance POINT	S	S	S	O	L3 and L2 Plus use the graph. L2 uses the LOV or scoping. You can measure a Distance point using the Test Builder and scoping. The Test Builder application is optional for S2 systems and must be ordered separately.
Measure a Time POINT	S	S	S	O	Find a result using the Time axis. Easy to do using L3 and L2 Plus from the time graph. May be done using scoping in L2, but more complicated- not recommended.
Measure Tensile Strength POINT	S	S	S	O	Tensile strength is a material testing term and should be performed using L3. The term "strength" is sometime used to refer to maximum load or stress, so depending on the application, L2 Plus or L2 may be used.

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Measure Compressive Strength POINT	S	S	S	O	Compressive strength is a material testing term and should be performed using L3. The term "strength" is sometime used to refer to maximum load or stress, so depending on the application, L2 Plus or L2 may be used.
Measure Modulus @ Elongation POINTS	S				Modulus is a material testing term and should be performed using L3. Modulus points are generally the stress result at a specific elongation, e.g. Modulus @ 200% (Stress @ a 200% Strain).
Measure Offset Yield POINT	S				Offset Yield is a material testing term and should be performed using L3.
Measure Slope Intersection POINT	S	S			In material testing, slope=modulus and is generally associated with Elastic Modulus, Young's Modulus, Chord Modulus or other types of measurement involving Hooke's Law. Modulus is a material testing term and should be performed using L3. Slope is a force measurement term. The slope intercept can be used to measure initial tension in a spring. You MUST find the Slope before you can measure the Slope Intersection.
Measure Initial Spring Tension POINT	S	S	S	S	S2 should be used in spring testing applications. If more detailed analysis is required, L2 Plus or L3 may be used. L2 can be used but you estimate Initial Tension using a preload.
Measure Spring Free Length/Height POINT	S	S	S	S	S2 should be used in spring testing applications. Using Height mode, the height of any sample can be measured using any of the Lx products.
MODULUS & SLOPE MEASUREMENTS					
Measure Elastic (Young's) MODULUS	S				Elastic and Young's Modulus are material testing terms and should be performed using L3.
Measure Chord (Segment, Secant) MODULUS	S				Chord, Secant and Segment Modulus are material testing terms and should be performed using L3. This uses the 2-point measurement method in L3.
Measure Tangent MODULUS	S				Tangent Modulus is a material testing term and should be performed using L3.
Measure Automatic MODULUS	S				Automatic Modulus is Elastic or Young's Modulus. This is a material testing term and should be performed using L3.

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Measure Slope Intersection POINT	S	S			Slope is a force measurement term. L2 Plus can be used to perform slope measurements. L3 may also be used to perform slope measurements when stress and strain are not being measured. When measuring initial tension for a spring, you must first measure the slope before you can measure the initial tension using the Point Slope Intersection tool.
Measure Automatic SLOPE	S	S			Same measurement as Modulus except you are not measuring Stress/Strain.
Measure Tangent SLOPE	S	S			Same measurement as Modulus except you are not measuring Stress/Strain.
Measure Chord (Segment, Secant) SLOPE	S	S			Same measurement as Modulus except you are not measuring Stress/Strain.
PEAK & VALLEY MEASUREMENTS					
Measure Load at a PEAK	S	S			"Peaks & Valleys" are generally force measurements used to analyze adhesives or samples that involve peel testing. Peak does NOT mean Maximum. Peel tests are generally performed using L2 Plus, but may be performed using L3 when not using stress and strain.
Measure Distance at a PEAK	S	S			Measures the Distance at a specified Peak.
Measure Stress at a PEAK	S				Stress may be measured at a specific peak and this required L3 software.
Measure Strain (Elongation) at a PEAK	S				Strain may be measured at a specific peak and this required L3 software.
Measure Time at a PEAK	S	S			Time is a variable that can be measured using L3 or L2 Plus.
Measure Average Load across specified PEAKS	S	S			You may measure the average load between your specified Peaks. This averages the load data between the Start and Finish Peaks.
Measure the Number of PEAKS	S	S			Peaks are specified based on Sensitivity. When the rise and fall on your graph equal or are greater than your specified sensitivity, the area on the trace is considered a peak. You may specify sensitivity using L3 or L2 Plus, and thus can count the number of peaks. L2 Plus is preferred since stress is generally not measured.
Measure Load at a VALLEY	S	S			Valleys are measured BELOW the graph trace.
Measure Distance at a VALLEY	S	S			Measures the Distance at a specified Valley.

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Measure Stress at a VALLEY	S				Stress may be measured at a specific valley and this required L3 software.
Measure Strain (Elongation) at a VALLEY	S				Strain may be measured at a specific valley and this required L3 software.
Measure Time at a VALLEY	S	S			Time is a variable that can be measured using L3 or L2 Plus.
Measure Average Load across specified VALLEYS	S	S			You may measure the average load between your specified Valleys. This averages the load data between the Start and Finish Valleys.
Measure the Number of VALLEYS	S	S			Valleys are specified based on Sensitivity. When the rise and fall on your graph equal or are greater than your specified sensitivity, the area on the trace is considered a valley. You may specify sensitivity using L3 or L2 Plus, and thus can count the number of valleys. L2 Plus is preferred since stress is generally not measured.
MINIMUM, MAXIMUM AND AVERAGE MEASUREMENTS					
Measure MINIMUM Load	S	S	S	O	In L2, select from LOV. In L3 and L2 Plus find the minimum by selecting below the graph trace. Available in S2 provided the optional Test Builder is installed.
Measure MINIMUM Stress	S				L3 only. Find by selecting below the graph trace on the stress-strain or stress-time graph.
Measure MINIMUM Distance	S	S	S	O	In L2, select from LOV. In L3 and L2 Plus find the minimum by selecting below the graph trace. Available in S2 provided the optional Test Builder is installed.
Measure MINIMUM Strain (Elongation)	S				L3 only. Find by selecting below the graph trace on the stress-strain or strain-time graph.
Measure MAXIMUM Load	S	S	S	O	In L2, select from LOV. In L3 and L2 Plus find the maximum by selecting above the graph trace. Available in S2 provided the optional Test Builder is installed.
Measure MAXIMUM Stress	S				L3 only. Find by selecting above the graph trace on the stress-strain or stress-time graph.
Measure MAXIMUM Distance	S	S	S	O	In L2, select from LOV. In L3 and L2 Plus find the maximum by selecting above the graph trace. Available in S2 provided the optional Test Builder is installed.
Measure MAXIMUM Strain (Elongation)	S				L3 only. Find by selecting above the graph trace on the stress-strain or strain-time graph.

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Measure AVERAGE Load	S	S	S	O	In L2, select from LOV. In L3 and L2 Plus find the average using the AVG tool or scope between two specified points or two anchored result markers.
Measure AVERAGE Stress	S				In L3 find the average using the AVG tool or scope between two specified points or two anchored result markers.
Measure AVERAGE Distance	S	S	S	O	In L2, select from LOV. In L3 and L2 Plus find the average using the AVG tool or scope between two specified points or two anchored result markers. Available in S2 provided the optional Test Builder is installed.
Measure AVERAGE Strain (Elongation)	S				In L3 find the average using the AVG tool or scope between two specified points or two anchored result markers.
WORK/ENERGY MEASUREMENTS					
Measure Work or Energy	S	S			Energy or sometimes called Work, is the area beneath the stress-strain or load-distance curve.
Measure Resilience	S	S			Resilience is energy and is the area beneath the LxD curve. Resilience is generally used in force measurement.
DELTA MEASUREMENTS					
Measure DELTA between Load results	S	S	S	O	In L3 and L2 Plus, use the Delta tool and scoping to measure the change in Load between two points. In L2, you select Delta Load from your LOV. Available in S2 provided the optional Test Builder is installed.
Measure DELTA between Distance results	S	S	S	O	In L3 and L2 Plus, use the Delta tool and scoping to measure the change in Distance between two points. In L2, you select Delta Distance from your LOV. Available in S2 provided the optional Test Builder is installed.
Measure DELTA between Stress results	S				Stress is measured in L3 only.
Measure DELTA between Strain results	S				Strain is measured in L3 only.
Measure DELTA between Load results for Spring Rate	S	S		S	Spring Rate is the Delta Load divided by the Delta Height and may be selected from the LOV in S2 only.
Measure DELTA between Height results for Spring Rate	S	S		S	Spring Rate is the Delta Load divided by the Delta Height and may be selected from the LOV in S2 only.
Measure DELTA between Time results	S	S			In L3 and L2 Plus, use the Delta tool and scoping to measure the change in Time between two points.
MULTIVIEW DELTA MEASUREMENTS					

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Measure delta between multiple graph traces	S	S			Using Multiview tools can measure deltas using x- or y-axis.
BREAK MEASUREMENTS					
Measure Load at %DROP BREAK	S	S	S	O	Measures the Load when the load decreases by a percentage from the Maximum Load. Available in S2 provided the optional Test Builder is installed.
Measure Distance at %DROP BREAK	S	S	S	O	Measures the Distance when the load decreases by a percentage from the Maximum Load. Available in S2 provided the optional Test Builder is installed.
Measure Time at %DROP BREAK	S	S			Measures the Time when the load decreases by a percentage from the Maximum Load.
Measure Stress at %DROP BREAK	S				Measures the Stress when the load decreases by a percentage from the Maximum Load.
Measure Strain (Elongation) at %DROP BREAK	S				Measures the Strain (Elongation) when the load decreases by a percentage from the Maximum Load.
Measure Load at RATE BREAK	S	S			Measures the Load when the load decreases by a specified Load Rate.
Measure Distance at RATE BREAK	S	S			Measures the Distance when the load decreases by a specified Load Rate.
Measure Time at RATE BREAK	S	S			Measures the Time when the load decreases by a specified Load Rate.
Measure Stress at RATE BREAK	S				Measures the Stress when the load decreases by a specified Load Rate.
Measure Strain (Elongation) at RATE BREAK	S				Measures the Strain when the load decreases by a specified Load Rate.
REPORTS & EXPORTS	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
Print Report automatically at end of Test Run	S	S			Post Test option called PRINT REPORT
Print Graph	S	S	S	S	Prints graph image from Test Run
Print Batch	S	S	S	S	Prints Batch table from Test Runs (Batch)
Print Statistics	S	S	S	S	Prints Statistics from Test Runs (Batch)
Display Statistics: Min, Max, Avg, Std Deviation, Six Sigma	S	S	S	S	Statistical calculations are standard on all Lx products.
Export Results automatically at end of Test Run	S	S	S	S	Executes automatic export of results to csv file
Export Data automatically at end of Test Run	S	S	S	S	Executes automatic export of raw data of Test Run to csv file
CALIBRATION AND CORRECTIONS	**L3**	**L2 Plus**	**L2**	**S2**	**Comments**
Load Deflection Compensation	S	S	S	S	All Lx products

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Load Corrections- 11 Points	S	S	S	S	L2 and S2 products may be calibrated at 5 points tension and 5 points compression plus zero
Load Corrections- 21 Points	S	S			L3 and L2 Plus products may be calibrated at 10 points tension and 10 points compression plus zero
Extensometer Corrections	S				L3 product only. Cannot use extensometers with FMx frames or L2 Plus, L2 or S2 software.
Deflection Correction	S	S	S	S	All Lx products