

## 840L Servo-All-Electric™ Test System For Static, Fatigue, Dynamic Testing

Force Range: 0.0001 - 2500 N (580 lb)

Speed Range: Static to 15 Hz (840LE); Over 50 Hz (840LM)

### System Overview

The 840L system characterizes and tests materials, devices and components over a wide spectrum of load and displacement. Each system is configured from a number of actuators and transducers to serve exact customer needs. When configured with short travel LVDT's or small load cells – the package delivers unmatched accuracy and control in micromechanical test applications.

Systems include:

- Compact load frame.
- E or M Series Actuators
- Load cell, extensometers, and LVDTs
- 2370 Servocontroller with Power Pack
- MS Control Software
- PC with USB port
- Accessories - Grips, Extensometers, Baths, Software

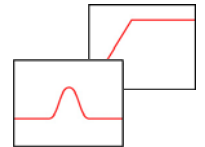


## Perform Standard or Special Static, Dynamic or Fatigue Tests

### Monotonic Static and Dynamic Tests

Tensile, Compressive, Flexural, Stress Relaxation, Indentation or Creep Tests

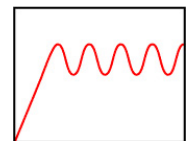
Slow or quick ramps in load, strain or position control. Set up and collect force, strain, and displacement data for materials characterization, stress – strain plotting, and calculate strength properties. Special applications software products available to automate multi-step creep and stress relaxations tests to get more data out of each test run. Generate impact loads and capture high speed force, strain, and displacement data for materials characterization or product performance.



### Fatigue, Fracture & Cyclic Tests

Tension / Tension, Compression / Compression, Tensile / Compression (thru zero) Fatigue Tests

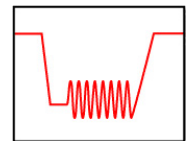
Run load or strain controlled cyclic fatigue tests to determine cycles to failure or to prove your device meets endurance requirements. Adaptive peak valley control feature adjusts amplitude as test sample responds. Optional metals research application software includes full suite of LCF and fracture mechanics software programs.



### Dynamic Characterization Tests

Tension, Compression, Shear

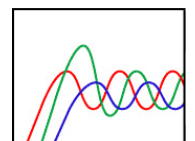
Sweep time and temperature, change strain and load rates and gather accurate stress and strain data to measure time-dependent characteristics of viscoelastic materials using special test software. Analyze and report the full dynamic properties of gels, elastomers, polymers, tissues and biomaterials.



### Multiaxial Tests

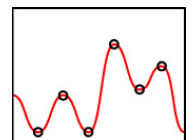
Planar Biaxial Characterization and Fatigue Tests, Combined Axial / Torsion Tests

Combine Tension, Compression, Torsion, Pressure or whatever channels you wish with the expansive 2370 controller and characterize your new material by testing it in the final application. Use as many modes of control as you wish and perform in-phase or out-of-phase modeling,



### Random Spectrum

**Point loading** - Create your own test, Mix n' match - Import your loading profile from a spreadsheet and produce customized point by point waveforms. You can mix ramps and sinusoids, switch control modes during a test condition, or customize your data collection process.



## Lightweight Compact Load Frame

Horizontal or vertical mode. Occupies 0.05 m<sup>2</sup> (0.5 ft<sup>2</sup>) space. Frame features adjustable test space and crosshead or baseplate mounted actuator. Actuator power pack 110V or 220V.

## 2370 Control Hardware

- High Speed (300 MIPS) Digital Signal Processor
- 24 bit Analog Data Conversion
- 32 bit Digital Data acquisition
- 40 bit Servo-Loop Calculations

The 2370 Series offers the latest in electronic performance, functionality and cost savings. 2370 hardware, combined with Global Data Sharing (GDS) software, offers the test engineer a unique, flexible, and modular test control system. Each 2370 includes two strain bridge feedback channels for load cells or extensometers and one circuit to provide user choice of AC type signal conditioner for an LVDT position transducer or any transducer that can provide a high level 10V analog input signal. A digital encoder is included as the fourth feedback and control channel. Two servo-output channels provide 10V signals to actuators. Eight channels of digital input and output provide drive and device control including hydraulic pump on/off or high/low pressure in servohydraulic applications.

Data can be acquired to 12.5 kHz on all feedback channels concurrently (50 kHz total). The 50 mm (2") full scale LVDT could be set to a 500 micron expanded range, with reliable measurements to 0.5 micron resolution. The same ratios are true of strain bridges as well. An optional expansion module (-303) increases the controllers reach to include up to four potential control stations to as many as four data acquisition and signal conditioning options.

## Mechanical Options

### Load Frame

- Frames for use inside incubators
- Frames engineered to requirements
- Larger test space – see 800 series load frames

### Accessories

- Load Cell Selections – from 50 grams to full rating of machine.
  - Grips and fixtures - for regular and irregular specimens.
  - Saline baths, environmental chambers and furnaces
- Extensometers – contacting and non contacting

## 2370 Software Technology & Products

2370 Software Products are all compatible with Global Data Sharing (GDS) which requires a PC with Microsoft Operating System (XP or Vista).

**MachineBuilder Software** (MTL32) enables user setup and application of machine resources (e.g. transducers) to test actuators. Panels for servotuning, calibration, and global limit setting make it possible to set up and switch test station configurations easily.

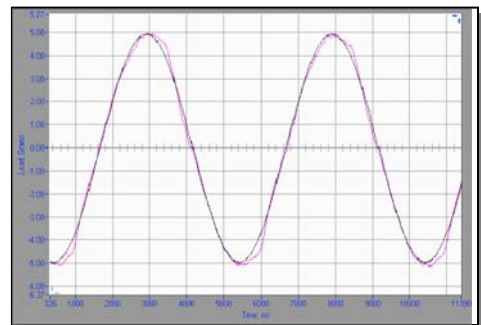
**TestBuilder Software** (MS32) enables users to set up, launch, and monitor tests. Test data may be saved and exported for reports. Separate user panels are available for static and fatigue tests. Users create, store and execute tests including command signal, data acquisition and export of data to Excel.

**GDS Toolkit** is an optional application developer's support program that facilitates software components and full applications development. GDS is a powerful capability that shortens the test development process and brings significant advantages to customers.

**Standard Test Application** programs are available for common test methods.

## Optional Control Products & Software

- Dynamic Properties Application Program - for solids
- Automated Multistep Stress Relaxation and Creep
- Global Data Sharing Developers Toolkit



Example of high resolution load control - waveform at 0.5% ( $\pm 5$  g) of load cell full scale ( $\pm 1000$  g).

## 840L Servo-All-Electric Test Systems

### Specifications

Actuator Model	M80 High Frequency	E216	Options
Max Static Force	± 206 N (46 lb)	± 2.5 kN (575 lb)	Higher load
Fatigue Rating	± 285 N (65 lb)	± 1200 N (270 lb)	Higher load
Stroke	± 25 mm (±1")	±63 mm (±2.5")	Longer stroke
Cyclic performance	Static to 50 Hz	Static to 15 Hz	Higher Freq
Velocity Max	3.8 m/s (150 in/s)	200 mm/s (8 in/s)	Faster
Example Performance at 10 Hz:	± 25 mm (± 1")	± 3 mm (± 0.125")	Higher Freq
Peak Impact Load (1 s duration)	± 1860 N (415 lb)	-	-
Max load at max velocity	50% load	100% load	-

### Dimensional and Utility Requirements

Load Frame Model	840L	Options
Crosshead Type	Adjustable	Fixed
Column Clearance	202 mm (8")	Made to order
Frame height (min test space)	445 mm (17.5") H	Made to order
Test space	0 to 350 mm (14")	Made to order
Frame height (max test space)	795 mm (31") H	Made to order
Footprint	3.5"D x 11"W	Made to order
Weight	18 kg (40 lb)	Made to order
Power Pack Enclosure	12"H x 16"W x 10"D	
Power Requirements	110V (220V optional)	

Notes – Specifications are based on typical test samples and may vary depending on actual conditions. Performance curves are available. All speed specifications based on 220 V Power Pack. Discuss all critical specifications with an application engineer.



840L Horizontal Setup