

# Data Sheet

## Motorized Test Stand w/PC Control ESM301/ESM301L

32-1095 REV 7

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The ESM301 and extended length ESM301L are highly configurable motorized test stands for tension and compression testing applications up to 300 lbF (1.5 kN) for laboratory and production environments. The stands can perform a wide range of tests, including break testing, cycling, limit testing to a load or distance, load holding, elongation testing, tensile testing, compression testing, and more. Satisfy various test methods through an easy-to-use menu, allowing the configuration of test speed, force and distance limits, cycling, preload, and many other functions. The stands can be controlled via its console or PC.

Functions are offered individually through a unique “build-your-own” configuration platform. Order any combination of functions to customize the stand to specific requirements. Functions not ordered originally can be activated in the field. A password can be set to protect against unauthorized changes. Modular mechanical design allows the test frame and controller to be separated for various mounting configurations.

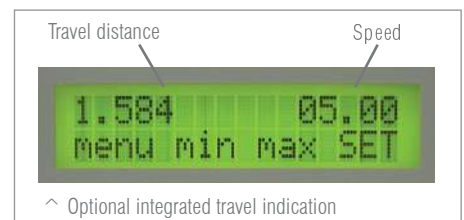
### Standard Features

- LCD display with UP, DOWN, STOP, & emergency stop buttons & variable function keys
- Selectable speed units of measurement (in/min & mm/min)
- Password protection of test parameters
- Integrated travel limit switches
- Removable fixture mounting plate with matrix of threaded holes
- Stepper motor-driven, produces 0% speed variation with load
- Mounting holes for bench mounting
- Unique mechanical design significantly reduces column bending

< The ESM301 and ESM301L are shown in typical configurations with Series 5 digital force gauges and G1061 wedge grips



^ Digital controller features a backlit LCD screen with menu choices for ease of setup and operation



^ Optional integrated travel indication

### Optional Hardware Features

- **Multi-function cable, Series 5/4 to controller (09-1162)**  
Connects a Series 5 or Series 4 force gauge to the controller. This single cable is used to transmit set points, overload signals, and force data.
- **Serial cable, controller to PC (09-1056)**  
Sends force and travel data on a single cable via RS-232 to a PC.
- **Column extensions (ESM301-002-1, -2, -3)**  
Increase clearance between the force gauge and test stand base. Available in 6" (150 mm), 12" (300 mm), 24" (600 mm), and custom lengths. Bench mounting kit recommended.
- **Bench mounting kit (ESM301-003)**  
Facilitates safe mounting to a work bench. Consists of a set of mounting adapters, and four sets of hardware with Allen key to accommodate surfaces of various thickness. Recommended when ordering column extensions.

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### Optional Controller Features

Any of the below option packages may be purchased at time of order or may be enabled in the field at a later date through a simple activation process. A complete options package is also available, including all of the below features at a discounted price. The stands are shipped in Demo Mode, during which time all available features are enabled for 160 hours of operation.

Feature	Part No.	Description	Requirements
Computer control	EF010	A bi-directional RS-232 port is provided to interface with a PC. Users can write a custom program utilizing a library of ASCII commands or control the stand via a PC using legacy Nexygen TCD software (not available from Mark-10).	<ul style="list-style-type: none"> <li>- Series 5 force gauge</li> <li>- 09-1056 serial cable</li> <li>- 09-1162 cable</li> <li>- ESM301(L)-001 integrated travel indication</li> <li>- EF011 programmable travel set points</li> </ul>
Travel indication	ESM301-001 ESM301L-001	Travel is indicated on the front panel, and an RS-232 port is provided. Position indication is provided via an internal linear scale, producing significantly higher accuracy than with conventional rotary encoder based designs. Backlash and hysteresis are virtually eliminated.	- Order option, not field installable
Programmable travel limits	EF011	The ESM301 can stop at or cycle between programmable upper and lower travel distances.	ESM301-001 or ESM301L-001 travel indication option
Overload protection	EF012	Protects a force gauge against overload. Program the desired percentage of full scale of the gauge. Adjustable analog output voltage setting allows the ESM301 to interface with virtually any gauge with analog output.	<ul style="list-style-type: none"> <li>- Series 5 or Series 4 force gauge</li> <li>- 09-1162 cable</li> </ul>
Auto return	EF013	The crosshead moves to a limit switch, force set point, travel position, or break, then stops and reverses direction at full speed to the other limit.	<ul style="list-style-type: none"> <li>- Reversing at force set point: Series 5 / 4 force gauge and 09-1162 cable</li> <li>- Reversing at travel limit: EF011 programmable travel limits option</li> <li>- Reversing at break: EF019 break detection option and 09-1162 cable</li> </ul>
Cycling / dwell time	EF014	Same as auto return, but with the ability to program up to 100,000 cycles. Programmable dwell time time for upper and lower limits (set independently) can be set up for up to 10,000 seconds.	Same as auto return. Requires EF016 for independent up and down speeds.
Independent Up and Down Speeds	EF016	Configurable speeds for up and down directions .	-
Low Speed Extension	EF017	Extends the speed range to 0.02 - 15 in/min (0.5 - 330 mm/min).	-
High Speed Extension	EF018	Extends the speed range to 0.5 - 45 in/min (13 - 1100 mm/min).	-
Break Detection	EF019	Crosshead stops at a sudden drop in force. Programmable percentage of peak force.	<ul style="list-style-type: none"> <li>- Series 5 force gauge firmware V1.7+</li> <li>- 09-1162 cable</li> <li>- Test stand firmware V2.0+</li> </ul>
Load Holding	EF020	Dynamically adjusts the crosshead position to maintain a programmed load for an indefinite or specified period of time.	<ul style="list-style-type: none"> <li>- Series 5 force gauge firmware V1.7+</li> <li>- 09-1162</li> <li>- Test stand firmware V2.0+</li> <li>- If a specified time is required, order EF014 cycling option</li> </ul>
Preload / Sample Touch	EF021	Stops the crosshead and freezes the travel display at an initial preload - useful in tensile, compression, spring, elongation, and other applications. Preload is programmable as a percentage of force gauge full scale. Three modes: (1) stop, (2) stop and zero, and (3) zero without stopping.	<ul style="list-style-type: none"> <li>- ESM301-001 or ESM301L-001 travel indication option</li> <li>- Series 5 force gauge firmware V1.7+</li> <li>- 09-1162 cable</li> <li>- Test stand firmware V2.0+</li> </ul>
Complete Options Package	Includes all Controller Features listed above		

## Dimensions in (mm)

Technical drawing of the MOUNTING PLATE showing front, side, and top views with dimensions in inches and millimeters.

**FRONT VIEW:**

- Overall height: A
- Bottom panel width: 5.50 [140.0]
- Bottom panel height: 4.20 [106.7]
- Bottom panel depth: 4.50 [114.3]

**SIDE VIEW:**

- Overall height: B
- Mounting plate height: C
- Mounting plate width: 3.00 [76.2]
- Base width: 13.20 [335.3]
- Base depth: 0.35 [8.9]

**MOUNTING PLATE TOP VIEW:**

- Overall width: 5.00 [127.0] TYP
- Overall height: 3.25 [82.6]
- Internal width: 2.800 [71.1]
- Internal height: 2.300 [58.4]
- Internal depth: 2.75 [70.1]
- Mounting holes: #10-32 UNF-2B X 0.350 DEEP X34
- Mounting holes: 5/16-18 UNC-2B X 0.350 DEEP
- Mounting holes: 0.600 [12.7] TYP

## Ordering Information

1. ESM301/ESM301L contains a universal power supply (80 - 240V) and includes a power cord with US plug. Add suffix 'E' for Euro plug, 'U' for UK plug, or 'A' for Australian plug.
2. Factory installation only. Also available as a retrofit.
3. If force data output is required, both the 09-1162 and 09-1056 cables are required.
4. Requires: Series 5 force gauge, 09-1056 serial cable, 09-1162 multi-function cable, ESM301(L)-001 travel indication, and EF011 programmable travel limits.
5. Requires ESM301(L)-001 integrated travel indication option.
6. Firmware version 2.0+ required.