

Programmable Test Stand w/PC Control **ESM301**

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The ESM301 is a highly configurable motorized test stand for tension and compression testing applications up to 300 lb (1.5 kN). The stand can be controlled from the front panel or via a computer and is fully compatible with Nexygen™ TCD software. The ESM301 is engineered on a unique modular platform, allowing for “build-your-own” configurability. Features can be ordered individually at time of order or activated in the field. Integrated travel indication, overload protection, and a host of programmable parameters makes the ESM301 quite sophisticated, while its intuitive menu structure allows for quick, simple setup and operation. A password can be programmed to prevent unauthorized changes. With a rugged and modular design, the ESM301 is a compelling solution for applications in laboratory and production environments.

Standard Features

- LCD display with UP, DOWN, STOP, and emergency stop buttons and soft keys
- Selectable speed units of measurement (in/min & mm/min)
- Password protection of test parameters, to prevent unauthorized changes
- 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 is shown in a typical configuration with Series BG digital force gauge and G1008 film & paper grips



Optional integrated travel indication



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

Optional Hardware Features

- **Multi-function cable, BG gauge to controller**
Connects a Series BG force gauge to the controller. This single cable is used to transmit set points, overload signals, and force data.
- **Serial cable, controller to PC**
Sends force and travel data on a single cable via RS-232 to a PC.
- **Column extensions**
Available in 6” (150 mm), 12” (300 mm), 24” (600 mm), and custom lengths
- **Bench mounting kit**
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.

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Optional Controller Features

The below option packages may be purchased at time of order or may be added in the field through a code activation process. A complete options package is also available.

■ Computer Control

A bi-directional RS-232 port is provided to interface with a PC. Users can write their own custom program or control the stand via a PC using Nexygen™ TCD software. Requires a Series BG force gauge, 09-1056 serial cable, 09-1143 multi-function cable, ESM301-001 travel indication, and EF011 programmable travel limits.

■ Travel Indication*

Travel is indicated on the front panel, and an RS-232 port is supplied. Position indication is provided via an internal linear scale, producing significantly higher accuracy than with conventional rotary encoder-based designs. Backlash and nonlinearity are virtually eliminated.

■ Programmable Travel Limits

The ESM301 can stop at or cycle between programmable upper and lower travel distances. Requires ESM301-001 integrated travel indication option.

■ Overload Protection

Protects a force gauge against overload (requires the 09-1143 multi-function cable). The user programs the desired percentage of full scale of the gauge. Adjustable analog output voltage setting allows the ESM301 to interface with virtually any force gauge with analog output.

■ Auto-return

The crosshead moves to a limit switch, force (requires a Series BG force gauge), or travel position (requires EF011 programmable travel limits), stops, and reverses direction at full speed to the other limit switch, force, or travel position.

■ Cycling / Dwell Time

Same as Auto-return, but with the ability to program the number of cycles up to 99,999 cycles. Dwell time allows the operator to program the length of time, up to 9,999.9 seconds, in 0.1 second intervals, for which the crosshead pauses between cycles. Independent up and down speeds may be programmed (requires EF013).

■ Programmable Button Functions

Expands UP and DOWN button operation to three user-configurable modes:

1. Maintained (standard): short push produces continuous motion until STOP is pressed
2. Momentary: crosshead moves only while the button is pressed
3. Auto: short push produces maintained motion, while holding the button down will produce momentary motion

■ Independent Up and Down Speeds

Configurable speeds for up and down directions

■ Low Speed Extended Range

Extends the speed range to 0.02 - 13 in/min (0.5 - 330 mm/min)

■ High Speed Extended Range

Extends the speed range to 0.5 - 45 in/min (13 - 1100 mm/min)

* Factory installation only. Also available as a retrofit.

** If force data output is required, both the 09-1143 and 09-1056 cables are required.

*** Requires: Series BG force gauge, 09-1056 serial cable, 09-1143 multi-function cable, ESM301-001 travel indication, and EF011 programmable travel limits.

**** Requires ESM301-001 integrated travel indication option

Specifications

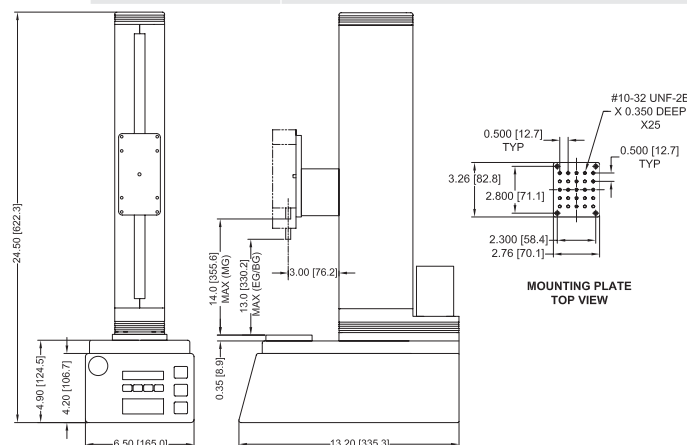
Load capacity 300 lbf [1.5 kN] 200 lbf [1 kN]	Up to 24 in/min (610 mm/min) > 24 in/min (> 610 mm/min)
Standard speed range	0.5-13 in/min [13-330 mm/min]
Maximum travel	11.5 [292 mm]
Speed setting accuracy	±0.2%
Speed variation with load	±0% [Stepper motor driven]
Limit switch repeatability	0.001 in [0.03 mm]
Travel accuracy	±0.002 in [0.05 mm]
Travel repeatability	0.001 in [0.02 mm]
Travel resolution	0.001 in / 0.02 mm
Power	Universal input 80-240 VAC, 50/60 Hz
Weight (without options)	34 lbs [15.6 kg]
Included accessories:	Ext. rod, small hook, medium hook, #10-32 coupler, compression plate, gauge mounting hardware, tool kit

Ordering Information

ESM301	Motorized test stand, 110 V
ESM301E	Motorized test stand, 220 V
ESM301-001*	Travel indication with RS-232 output*
ESM301-002-1 / -2 / -3	Column extension, 6" / 12" / 24"
ESM301-003	Bench mounting kit
09-1143**	Multi-function cable, BG to ESM301**
09-1056**	Serial cable, ESM301 to PC**

Controller Options

EF010***	Computer control via RS-232***
EF011****	Programmable travel limits****
EF012	Integrated overload protection (requires 09-1143 cable)
EF013	Auto return
EF014	Cycling / dwell time
EF015	Programmable button functions
EF016	Independent up and down speeds
EF017	Extended speed range, low
EF018	Extended speed range, high
EFCOMP	Complete options package



Premium Digital Force Gauges **Series BG**



The Series BG Digital Force Gauge is an advanced force measurement instrument, with sophisticated measurement capabilities, data outputs, computer control capabilities, and a long list of features and configurable settings.

Specifications

Accuracy:	±0.2% of full scale ±1 digit
Power:	AC or rechargeable battery with Intelligent Power Management System (IPM), a 3-step system that warns the user via a "LO BAT" indicator and then powers off the gauge.
Battery life:	8-10 hours of continuous use
Selectable units of measurement:	lbF, N, kg/g (depending on model)
Outputs:	Standard
RS-232	Fully configurable up to 9600 baud. Includes Gauge Control Language (GCL) for full computer control of all functions.
Mitutoyo (Digimatic)	Serial BCD suitable for all Mitutoyo SPC-compatible devices
Analog	±1 VCD, ±0.25% of full scale at capacity. + for compression, - for tension.
General purpose I/O	Three open collector outputs and one input (utilizing Mitutoyo lines)
Set points	Three open collector lines (utilizing Mitutoyo lines)
Configurable settings:	Analog filter, digital filters, RS-232, outputs selection (other than RS-232), automatic output (RS-232), automatic shutoff, initial (default), averaging mode, calibration
Load cell deflection (at full scale):	See Ordering Information
Safe overload:	150% of full scale (display shows "----" at 110% and above)
Weight (gauge only):	BG012 - BG200: 0.95 lb [0.4 kg], BG500: 1.12 lb [0.5 kg]
Environmental requirements:	40° F - 100°F [5°C - 45°C], <96% humidity (non-condensating)
Thermal effects:	Zero: 0.03% of full scale/°C, Span: 0.01% of full scale/°C
Housing construction:	Aluminum
Included accessories:	Chisel, cone, V-groove, hook, flat, extension
Warranty	3 years (see individual statement for further details)

Features

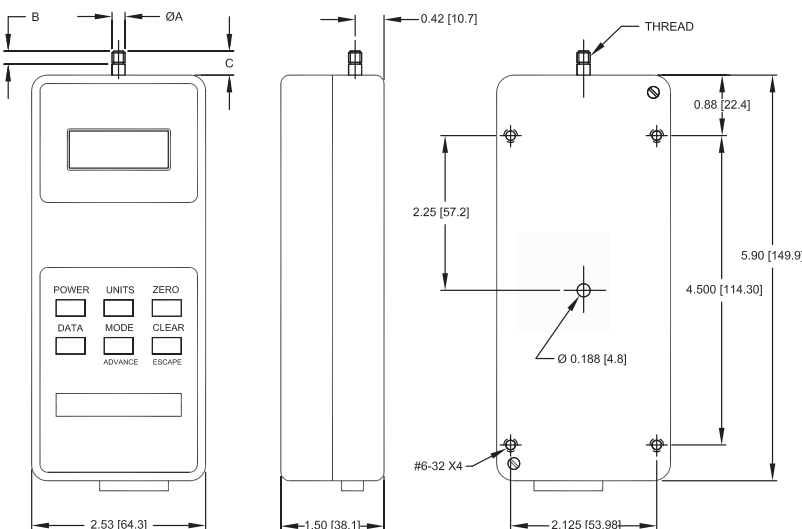
Data outputs	RS-232, Mitutoyo (Digimatic), and analog outputs. Automatic timed output (RS-232) included.
Set points	Programmable high and low force set points for triggering external devices (ex. motorized test stand, alarm, etc).
Data averaging	Calculates average force over a specified time (programmable)
External trigger	Useful for contact or switch activation force testing and data capture
Reversible housing	Housing can be reversed for handheld or test stand use

Optional Equipment

Output cables	Various data output cables are available
Hi / lo limits indicator	Set limit conditions for a test - the indicator will display red lights for high and low limits, and a green light to indicate passing.
Overload protection module	Protects the force gauge against overloads during motorized tests. Adjustable from 10% to 150% of gauge's full capacity. For use with motorized test stands.
Set point cable	Stops test stand travel at programmable high and low set points for tension and compression forces. For use with motorized test stands.

Dimensions

in [mm]



	BG012 - BG200	BG500
ØA	0.200 [5.8]	0.375 [9.5]
B	0.19 [4.8]	0.44 [11.2]
C	0.35 [8.9]	0.68 [17.3]
Thread	#10-32	5/16-18

Ordering Information

Model No.	Capacity x Resolution	Deflection
BG012	0.12 x 0.00005 lbF, 50 x 0.02 gF, 0.5 x 0.0002 N, 110V	0.005 [0.13]
BG025	0.25 x 0.0001 lbF, 100.00 x 0.05 gF, 1 x 0.0005 N, 110V	0.010 [0.25]
BG05	0.5 x 0.0002 lbF, 250 x 0.1 gF, 2.5 x 0.001 N, 110V	0.010 [0.25]
BG2	2 x 0.001 lbF, 1 x 0.0005 kgF, 10 x 0.005 N, 110V	0.009 [0.23]
BG5	5 x 0.002 lbF, 2.5 x 0.001 kgF, 25 x 0.01 N, 110V	0.005 [0.13]
BG10	10 x 0.005 lbF, 5 x 0.002 kgF, 50 x 0.02 N, 110V	0.010 [0.25]
BG20	20 x 0.01 lbF, 10 x 0.005 kgF, 100 x 0.05 N, 110V	0.004 [0.10]
BG50	50 x 0.02 lbF, 25 x 0.01 kgF, 250 x 0.1 N, 110V	0.010 [0.25]
BG100	100 x 0.05 lbF, 50 x 0.02 kgF, 500 x 0.2 N, 110V	0.010 [0.25]
BG200	200 x 0.1 lbF, 100 x 0.05 kgF, 1000 x 0.5 N, 110V	0.010 [0.25]
BG500	500 x 0.2 lbF, 250 x 0.1 kgF, 2500 x 1 N, 110V	0.010 [0.25]

For 220V operation, add suffix E to model number. Example: BG10E