



Series 7 Professional Digital Force Gauges

Series 7 professional digital force gauges are designed with a number of sophisticated features for the most demanding tension and compression measurement applications, up to 500 lbf (2,500 N). The gauges feature $\pm 0.1\%$ accuracy and a blazingly fast, industry-leading sampling rate of 14,000 Hz, producing reliable results for extremely quick-action tests.

Features:

- **High speed data capture and storage**
Capture and store up to 5,000 continuous data points at a rate of up to 14,000 readings per second. This unique function is ideal for capturing switch activation forces, sharp breaks, and other short-duration applications.
- **Automatic data output / save / zero / I/O pin toggle**
Upon peak force detection, I/O pin toggle can stop a Mark-10 motorized test stand.
- **Programmable footswitch command string**
Up to 3 functions may be specified, along with delays between each function.
- **Custom unit**
A user-defined unit multiplier may be programmed for custom applications.
- **1st / 2nd peak detection**
For tensile testing and other applications.



Series 5 Advanced Digital Force Gauges




Series 5 premium digital force gauges feature a fast sampling rate of 7,000 Hz and $\pm 0.1\%$ accuracy. Additional advanced features such as averaging mode, external trigger mode, password protection, and data memory for 1,000 readings make this flexible gauge series ideal for a wide range of applications. Capacities up to 2,000 lbf [10,000 N].

Features:

- **Communication with external devices**
Full ASCII command set, allowing for communication with a PC, PLC, or other device through USB or RS-232. Mitutoyo and analog outputs also included.
- **Averaging / external trigger modes**
Addresses the need to record the average force over time, useful in applications such as peel testing, while external trigger mode makes switch activation testing simple and accurate.
- **Data memory**
1,000-point data memory with statistics (min, max, mean, standard deviation), and outputs.
- **Password protection**
Passwords may be set for calibration and for individual keys, designed to protect the gauge against unauthorized changes.



Specifications

	 Series 7 Professional	 Series 5 Advanced	 Series 4 Performance
Accuracy (% of full scale)	±0.1%		±0.2%
Sampling rate	14,000 Hz	7,000 Hz	3,000 Hz
Resolution	1/5,000		1/2,000
Outputs	USB, RS-232, Mitutoyo, Analog		
RS-232	Configurable up to 230,400 baud	Configurable up to 115,200 baud	
USB	Configurable up to 230,400 baud		Configurable up to 115,200 baud
Mitutoyo (Digimatic)	Serial BCD suitable for all Mitutoyo SPC-compatible devices		
Analog	±1 VDC, ±2% FS at capacity. Positive for compression, negative for tension		
General purpose I/O	Three open drain outputs, one input		
Set point	Three open drain lines		
MESUR® Lite software included	Yes		
Data output functionality	Automatic output or by pressing DATA button, or requesting from a PC or other device		By pressing DATA button, or requesting from a PC or other device (currently displayed reading only)
ASCII command set for external control	Full command set		"?" only (request current reading)
Interface w/MESUR®gauge and MESUR® Lite	Full communication		Single point or continuous data output only
Interface w/ESM303 / 750 / 1500 test stands	Full communication, including PC control		Limited to force data, overload protection, and force set points
Data memory (readings, with output)	5,000	1,000	50
Data memory deletion	Any individual data point, or clear all		
Statistic calculations and output to PC	Max, min, mean, std. dev., number of readings, with output		
Break detection	Yes*	No	
1st / 2nd peak detection	Yes*	No	
Programmable footswitch command string	Yes	No	
Averaging mode	Yes*	Yes	No
External trigger mode	Yes**	Yes	No
Analog load bar graph shown on display	Yes		
Set points (for pass / fail indication)	Yes with high / low indicators, markers on analog bar graph, and outputs		
Password protection	Yes, for calibration and individual keys		No
Peak readings always displayed	Yes		
Programmable audible tones	Yes		
Calibration procedure	Configurable number of data points (up to 10 in each direction)		
Overload outputs	Dedicated pins for tension and compression		
Battery life	Rechargeable. Backlight on: up to 7 hours of continuous use / Backlight off: up to 24 hours of continuous use		
Units of measurement	lbF, ozF, gF, kgF, N, kN, mN (depending on model)		
Safe overload	150% of full scale (display shows warning at 110% and above)		
Weight (lb [kg])	M7-012 - M7-100: 1.0 [0.45] M7-200 - M7-500: 1.2 [0.54]	M5-012 - M5-100: 1.0 [0.45] M5-200 - M5-500: 1.2 [0.54] M5-750 - M5-2000: 1.8 [0.82]	M4-012 - M4-100: 1.0 [0.45] M4-200 - M4-500: 1.2 [0.54]
Included items	Carrying case, chisel, cone, V-groove, hook, flat, extension rod, universal voltage AC adapter/charger, rechargeable battery, quick-start guide, USB cable, NIST-traceable certificate of calibration with data. Download free MESUR® Lite or MESUR®gauge Plus demo period at www.mark-10.com/software .		

* With configurable automatic data output, data storage, and zero function upon event completion. Can also stop travel of certain motorized test stands.

** Can stop certain legacy motorized test stands upon event completion.



Ordering Information

Model No.	Capacity x Resolution							
	lbF	ozF	kgF	gF	N	kN	mN	
Series 7	M7-012	0.12 x 0.00002	2 x 0.0005	-	50 x 0.01	0.5 x 0.0001	-	500 x 0.1
	M7-025	0.25 x 0.00005	4 x 0.001	-	100 x 0.02	1 x 0.0002	-	1000 x 0.2
	M7-05	0.5 x 0.0001	8 x 0.002	-	250 x 0.05	2.5 x 0.0005	-	2500 x 0.5
	M7-2	2 x 0.0005	32 x 0.01	1 x 0.0002	1000 x 0.2	10 x 0.002	-	-
	M7-5	5 x 0.001	80 x 0.02	2.5 x 0.0005	2500 x 0.5	25 x 0.005	-	-
	M7-10	10 x 0.002	160 x 0.05	5 x 0.001	5000 x 1	50 x 0.01	-	-
	M7-20	20 x 0.005	320 x 0.1	10 x 0.002	10000 x 2	100 x 0.02	-	-
	M7-50	50 x 0.01	800 x 0.2	25 x 0.005	25000 x 5	250 x 0.05	-	-
	M7-100	100 x 0.02	1600 x 0.5	50 x 0.01	50000 x 10	500 x 0.1	-	-
	M7-200	200 x 0.05	3200 x 1	100 x 0.02	-	1000 x 0.2	1 x 0.0002	-
	M7-500	500 x 0.1	8000 x 2	250 x 0.05	-	2500 x 0.5	2.5 x 0.0005	-
Series 5	M5-012	0.12 x 0.00002	2 x 0.0005	-	50 x 0.01	0.5 x 0.0001	-	500 x 0.1
	M5-025	0.25 x 0.00005	4 x 0.001	-	100 x 0.02	1 x 0.0002	-	1000 x 0.2
	M5-05	0.5 x 0.0001	8 x 0.002	-	250 x 0.05	2.5 x 0.0005	-	2500 x 0.5
	M5-2	2 x 0.0005	32 x 0.01	1 x 0.0002	1000 x 0.2	10 x 0.002	-	-
	M5-5	5 x 0.001	80 x 0.02	2.5 x 0.0005	2500 x 0.5	25 x 0.005	-	-
	M5-10	10 x 0.002	160 x 0.05	5 x 0.001	5000 x 1	50 x 0.01	-	-
	M5-20	20 x 0.005	320 x 0.1	10 x 0.002	10000 x 2	100 x 0.02	-	-
	M5-50	50 x 0.01	800 x 0.2	25 x 0.005	25000 x 5	250 x 0.05	-	-
	M5-100	100 x 0.02	1600 x 0.5	50 x 0.01	50000 x 10	500 x 0.1	-	-
	M5-200	200 x 0.05	3200 x 1	100 x 0.02	-	1000 x 0.2	1 x 0.0002	-
	M5-300	300 x 0.1	4800 x 2	150 x 0.05	-	1500 x 0.5	1.5 x 0.0005	-
	M5-500	500 x 0.1	8000 x 2	250 x 0.2	-	2500 x 0.5	2.5 x 0.0005	-
	M5-750	750 x 0.5	12000 x 10	375 x 0.2	-	3750 x 2	3.75 x 0.002	-
	M5-1000	1000 x 0.5	16000 x 5	500 x 0.2	-	5000 x 2	5 x 0.002	-
	M5-1500	1500 x 1	24000 x 20	750 x 0.5	-	7500 x 5	7.5 x 0.005	-
M5-2000	2000 x 1	32000 x 20	1000 x 0.5	-	10000 x 5	10 x 0.005	-	
Series 4	M4-012	0.12 x 0.00005	2 x 0.001	-	50 x 0.02	0.5 x 0.0002	-	500 x 0.2
	M4-025	0.25 x 0.0001	4 x 0.002	-	100 x 0.05	1 x 0.0005	-	1000 x 0.5
	M4-05	0.5 x 0.0002	8 x 0.005	-	250 x 0.1	2.5 x 0.001	-	2500 x 1
	M4-2	2 x 0.001	32 x 0.02	1 x 0.0005	1000 x 0.5	10 x 0.005	-	-
	M4-5	5 x 0.002	80 x 0.05	2.5 x 0.001	2500 x 1	25 x 0.01	-	-
	M4-10	10 x 0.005	160 x 0.1	5 x 0.002	5000 x 2	50 x 0.02	-	-
	M4-20	20 x 0.01	320 x 0.2	10 x 0.005	10000 x 5	100 x 0.05	-	-
	M4-50	50 x 0.02	800 x 0.5	25 x 0.01	25000 x 10	250 x 0.1	-	-
	M4-100	100 x 0.05	1600 x 1	50 x 0.02	50000 x 20	500 x 0.2	-	-
	M4-200	200 x 0.1	3200 x 2	100 x 0.05	-	1000 x 0.5	1 x 0.0005	-
	M4-500	500 x 0.2	8000 x 5	250 x 0.1	-	2500 x 1	2.5 x 0.001	-

