Series EG

DIGITAL FORCE GAUGES

User's Guide

MARK-10

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GENERAL Section 1

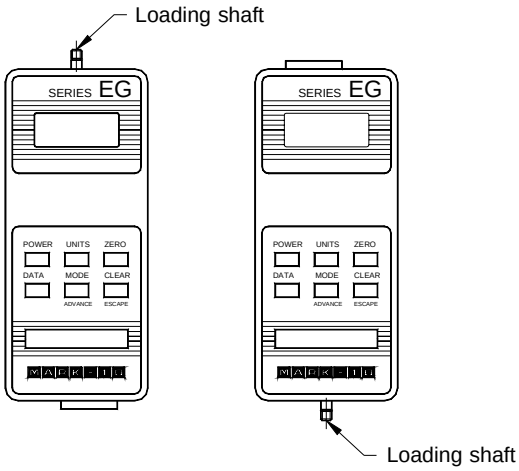
Controls

Six keys on the front panel are used for all functions and control of the instrument. Some have more than one function, depending on the mode of operation. The main functions are labeled above the keys and the secondary functions are below the keys in smaller type. In the list below the secondary functions are in parenthesis. For detailed descriptions of the secondary functions see Sections 3 and 5.

POWER (ENTER)	Turns power on and off.
UNITS	Selects units of measurement.
ZERO	Zeroes any tare value (up to the full capacity of the instrument) and clears the peak readings.
DATA	Initiates a data transmission sequence (if equipped with the communication option).
MODE (ADVANCE)	Switches the display between normal and peak modes of operation.
CLEAR (ESCAPE)	Clears peak readings from memory.

Orientation

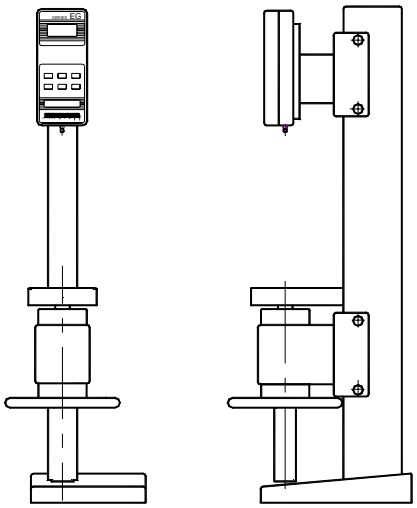
In order to accomodate a variety of testing requirements, the orientation of the loading shaft may be set up in either of the two positions shown below. In order to change the loading shaft orientation, simply unscrew the four screws on the back side of the housing, separate the two housing halves, rotate one half 180° and reassemble.



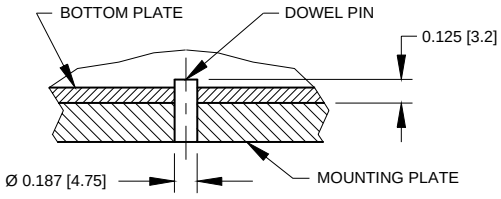
Upright orientation (as supplied)

Alternate orientation (for stand mounting, etc.)

Mounting



Gauge shown mounted on Model TSC test stand



Recommended use of a dowel pin

POWER Section 2

The gauge is powered by a 7.2-volt NiCd rechargeable battery. Since batteries are subject to self-discharge, it may be necessary to recharge the unit after a prolonged period of storage. Plug the accompanying charger into the AC outlet and insert the charger plug into the receptacle on the gauge. The gauge may be operated for 8-10 hours after approximately 16-18 hours of charging. ***Do not use chargers other than supplied or instrument damage may occur.***

There are three levels of low battery voltage indication. At the first level the display shows a steady "LO BAT" indicating approximately one hour of charge remaining. The second level is indicated by a flashing "LO BAT". At the third level the whole display except the "LO BAT" indicator will flash for three seconds after which time the gauge will turn itself off. This prevents the instrument from working at voltages too low for reliable operation.

CONFIGURATION Section 3

The Series EG gauges have several features with programmable options allowing many user-specified choices. In order to get to the configuration menu, perform the following:

1. Turn off the gauge.
2. Press and hold MODE.
3. Turn on the gauge.
4. Release MODE.

The version number of the internal software will be displayed for a short time followed by either 'AoFF' for a standard gauge or '232' if the communication option has been installed. The following secondary functions of keys are used during the configuration process.

ADVANCE	Used to step through menu choices.
ENTER	Used to select a menu choice.
ESCAPE	Used to quit any function (no change).

The following list shows all configuration options. ***Italics*** indicate factory settings.

232 - RS-232 settings sub-menu

232d	Output Disabled
232E	***Output Enabled***
300	300 baud
600	600 baud
1200	1200 baud
2400	2400 baud
4800	4800 baud
9600	***9600 baud***

7-1E	7 data bits, 1 stop bit, even parity
7-1o	7 data bits, 1 stop bit, odd parity
7-2E	7 data bits, 2 stop bits, even parity
7-2o	7 data bits, 2 stop bits, odd parity
7-2n	7 data bits, 2 stop bits, no parity
8-1E	8 data bits, 1 stop bit, even parity
8-1o	8 data bits, 1 stop bit, odd parity
8-1n	***8 data bits, 1 stop bit, no parity***
8-2n	8 data bits, 2 stop bits, no parity

Ft F	***Full data (numeric + units)***
Ft n	Numeric data only

bcd - Mitutoyo BCD settings sub-menu

bcdd	Output disabled
bcdE	***Output enabled***
nPOL	No polarity (absolute value)
POL	***Data with polarity (+ comp., - tension)***

AoFF - Automatic shutoff settings sub-menu

no	Disabled
1	1-minute automatic shutoff
5	***5-minute " "***
10	10-minute" "
20	20-minute" "
30	30-minute" "

init - Initial (default) settings sub-menu

LB	***Pounds as default units***
KG	Kilograms" "
N	Newtons " "
TC	***Real time display at turn on***
PEAK T	Peak tension display at turn on
PEAK C	Peak compression display at turn on

CAL - Calibration sub-menu. See Section 5

OUTPUTS Section 4

Outputs are available as part of the communication option. If installed, it offers RS-232, Mitutoyo BCD and analog outputs on the 9-pin male connector. Please refer to the pin diagram at the end of this section for proper connection.

RS-232

The data transmission can be initiated by pressing the DATA key or by an external device by sending ASCII "?" to the gauge. The gauge will respond by sending the current reading in either full or numeric format, depending on the configuration setting (see Section 3). Polarity sign indicates tensile (-) or compressive (+) forces. The transmitted string has the following format:

[POLARITY (SPACE OR -)][DATA][SPACE][UNITS (IF ENABLED)][CRLF]

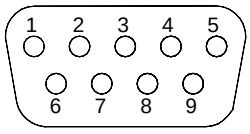
Mitutoyo BCD

This output is useful for connection to data collectors, printers, multiplexers or any other device capable of accepting Mitutoyo BCD data. The transmission is initiated by the DATA key (see Section 3 about settings) or by the receiving device.

Analog

This output can be used for chart recorders, oscilloscopes, data acquisition systems, etc. The output produces ±1 volt at full scale of the instrument. The polarity of the signal is positive for compression and negative for tension.

I/O connector pin diagram



DB-9P

1	RS-232 receive	Input
2	RS-232 transmit	Output
3	Mitutoyo request	Input
4	Mitutoyo clock	Output
5	Signal ground	-
6	+Analog signal	Output
7	+12V DC	Output
8	Mitutoyo ready	Output
9	Mitutoyo data	Output

CALIBRATION Section 5

Mount the gauge firmly with the loading shaft pointing downward. Go into the configuration mode as described in the previous section and select the calibration sub-menu by pressing ENTER three times when the display shows 'CAL'. After the display shows 'null' press ZERO, while insuring that there is no weight on the loading shaft other than the weight of the required attachments (hooks, etc.). The next displayed prompt is 'SPAn' at which time apply the exact weight equal to the ***full capacity of the gauge in pounds*** and press ENTER. A successful calibration procedure is indicated by 'donE' on the display. Press ENTER to save the new calibration data and to return to normal operation. In some cases the display will show 'nnnn' or 'uuuu' to indicate excessive or insufficient calibration weight. This can be caused by incorrect weights, tare weight of over 10% of the full capacity of the gauge or an overloaded sensor. The calibration procedure may be aborted at any time by pressing ESCAPE without changing the previous calibration information.

SPECIFICATIONS Section 6

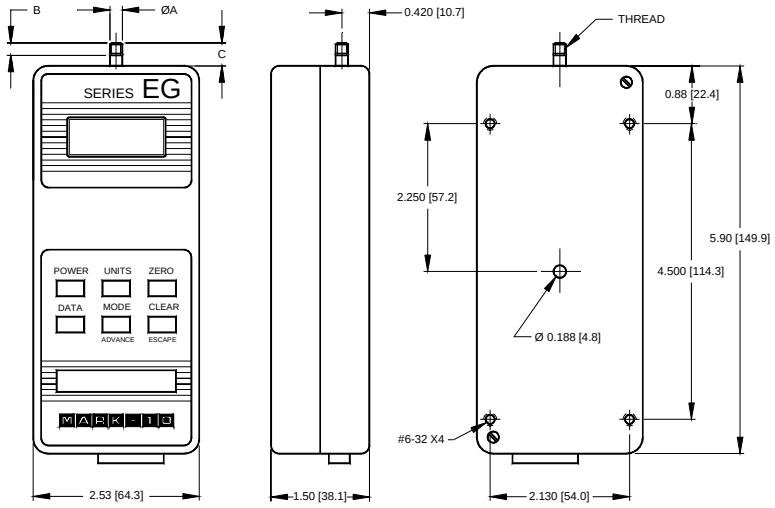
Accuracy:	±0.3% of full scale ±1count
Tare capacity:	110% of capacity. Display shows "----" at 110%
Overload capacity:	150% of capacity. Display shows "----" at 110%
Sampling rate:	30 times per second
Dispaly update:	2.5 times per second in normal mode. 30 times per second in peak mode
Display:	4-1/2-character LCD 0.3" [7.6 mm] high
Load cell deflection:	Approximately 0.010" [0.25 mm]
Outputs (optional):	
RS-232:	Baud rates between 300 and 9600
Mitutoyo:	Standard Mitutoyo SPC BCD output
Analog:	±1 VDC ±0.25% FS
Connector:	9-pin D-type male
Power:	7.2 NiCd battery or included AC adapter/charger. Simultaneous charging and operation of gauge is possible
Battery life:	8-10 hours per charge
Weight:	0.95 lbs. [0.4 kg]

Capacity x graduation

EG012	0.1200 x 0.0001 lbF	50.00 x 0.05 gF	0.5000 x 0.0005 N
EG025	0.2500 x 0.0002 lbF	100.0 x 0.1 gF	1.000 x 0.001 N
EG05	0.5000 x 0.0005 lbF	250.0 x 0.2 gF	2.500 x 0.002 N
EG2	2.000 x 0.002 lbF	1.000 x 0.001 kgF	10.00 x 0.01 N
EG5	5.000 x 0.005 lbF	2.500 x 0.002 kgF	25.00 x 0.02 N
EG10	10.00 x 0.01 lbF	5.000 x 0.005 kgF	50.00 x 0.05 N
EG20	20.00 x 0.02 lbF	10.00 x 0.01 kgF	100.0 x 0.1 N
EG50	50.00 x 0.05 lbF	25.00 x 0.02 kgF	250.0 x 0.2 N
EG100	100.0 x 0.1 lbF	50.00 x 0.05 kgF	500.0 x 0.5 N
EG200	200.0 x 0.2 lbF	100.0 x 0.1 kgF	1000 x 1 N
EG500	500.0 x 0.5 lbF	250.0 x 0.2 kgF	2500 x 2 N

Dimensions
in [mm]

MODEL	Ø A	B	C	THREAD
EG012 - EG200	0.200 [5.8]	0.19 [4.8]	0.35 [8.9]	#10-32
EG500	0.312 [7.9]	0.44 [11.2]	0.31 [7.9]	5/16-18



WARRANTY

Mark-10 Corporation expressly warrants to its buyer for three (3) years from the date of delivery that the goods sold are free from defects in workmanship and materials. Mark-10 Corporation will, at its option, repair or replace or refund the purchased price of goods found to be defective. This remedy shall be the buyer's sole and exclusive remedy. Any modification, abuse, exposure to corrosive environment or use other than intended will void this warranty. This warranty is in lieu of all other warranties, including implied warranties of merchantability and fitness for an intended purpose. In no event shall Mark-10 Corporation be liable for any incidental and consequential damages in connection with goods sold or any part thereof.

Mark-10 Corporation has been an innovator in the force and torque measurement fields since 1979. We strive to achieve 100% customer satisfaction through excellence in product design, manufacturing and customer support. In addition to our standard line of products we can provide modifications and custom designs for OEM applications. Our engineering team is eager to satisfy any special requirements. Please contact us for further information or suggestions for improvement.

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We Make A Measurable Difference In Force & Torque Measurement

Mark-10 Corporation
11 Dixon Avenue
Copiague, NY 11726 USA
1-888-MARK-TEN
Tel: 631-842-9200
Fax: 631-842-9201
Internet: www.mark-10.com
E-mail: info@mark-10.com

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