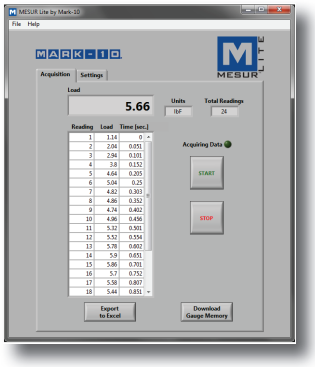


The M7I professional digital force / torque indicator is designed to work with a wide range of Mark-10 remote force and torque sensors (see page 4). With exclusive Plug & Test® technology, all calibration and configuration data is saved within the sensor's smart connector, not the indicator, allowing for true interchangeability. In addition, all sensors are fully compatible with other Mark-10 indicators.

The M7I features an industry-leading sampling rate of 14,000 Hz, producing reliable results for extremely quick-action tests. In addition to the M5I indicator's functions, the M7I features high speed continuous data capture and storage, with memory for up to 5,000 readings, at an acquisition rate of up to 14,000 Hz. The M7I also features programmable footswitch sequencing, break detection, and 1st / 2nd peak detection. Coefficient of friction unit of measurement and a user-defined unit of measurement add flexibility for specialized applications. For productivity enhancement, the indicator also features automatic data output, data storage, and zeroing functions upon the completion of break detection, averaging, external trigger, and 1st / 2nd peak detection.



MESUR® Lite data acquisition software is included with the M7I

The M7I interfaces with Mark-10 test stands to permit functions such as break testing, dynamic load holding, PC control capability, and more. The included MESUR® Lite data acquisition software tabulates continuous or single point data. Data saved in the indicator's memory can also be downloaded in bulk. One-click export to Excel easily allows for further data manipulation.



M7I is shown mounted to an optional AC1100 tabletop stand with Series R50 torque sensor

Features

- **Interchangeable force and torque sensors through Plug & Test® technology**
- **Sensor password protection, for preventing use of an unauthorized sensor**
- **High-speed 14,000 Hz sampling rate**
- **Continous data capture of up to 5,000 data points, at up to 14,000 Hz, downloadable to a PC**
- **Individual data point memory for up to 5,000 readings, downloadable to a PC**
- **USB, RS-232, Mitutoyo, and analog outputs**
- **Sample break detection with auto functions, including stopping movement of a Mark-10 test stand**
- **Automatic output / data storage / zeroing upon various event completions**
- **1st / 2nd peak detection**
- **5 units of measurement, plus Coefficient of Friction and user-defined unit with configurable name**
- **Programmable footswitch command string**
- **Programmable set points, with indicators and outputs**
- **Averaging mode - calculates average readings over time**
- **External trigger mode - for switch contact testing or remotely stopping display update**
- **Password protection, configurable for individual keys and calibration**

Display Indicators



Focus on Engineering: Specialized Functions

The M7I indicator features several functions typically found in more complex instruments, such as materials testers, data acquisition systems, and PLCs. The following unique features are highlighted:

High Speed Data Capture & Storage

> The M7I can 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. Configurable start and stop triggers are provided. The data acquisition rate is variable and can be slowed to also capture longer events, such as structure relaxation, material expansion, and others.

Data from the storage buffer can be exported to data collection software such as MESUR®gauge for further analysis and graphing. Using an M7I could replace cumbersome and expensive data acquisition hardware and software.





Footswitch Command String

> Integrate your footswitch / automation system with an M7I indicator to improve testing ergonomics and efficiency; no need for multiple key presses. Up to three steps may be programmed for a single footswitch activation.

Select from several commands, including request peak reading, zero the display, save to memory, and others. Time delays can be inserted between each step.

Automatic Data Output / Save / Zero / I/O Pin Toggle

> Upon completion of several event types, the M7I can perform the following automatic functions:
(1) Save the peak reading to memory, (2) Transmit the peak reading via USB, RS-232, or Mitutoyo output, (3) Zero the display, and (4) Toggle an I/O pin, for example to stop movement of a Mark-10 test stand.

Applicable events include:
(1) Sample break detection (also applicable to samples which slip, click, or otherwise reach a peak, then fall), (2) Completion of an averaging sequence, (3) External trigger (ex. switch activation), and
(4) 1st / 2nd peak capture (ex. torque tool testing, tensile testing).





User-defined Unit of Measurement

> The M7I displays 6 standard units of measurement. One additional user-defined unit is provided for unique applications. A base unit is specified, along with a multiplier, and 5-character name.

Typical applications:
(1) To measure the torque produced by pressing on a lever in a mechanical assembly, configure the multiplier based on the length of the lever, thereby converting a unit such as N into Ncm.

(2) To measure the pressure produced by a circular compression plate on a foam sample, configure the multiplier based on the area of the plate, thereby converting a unit such as lbF into psi.

Focus on Engineering: Reversible Housing

Display and keypad are upright

Sensor connector oriented down





Housing separates into reversible halves, electrically connected by gold-plated spring contacts.



Sensor connector oriented up

Reversible housing allows the sensor connector to be oriented up or down.

The display and keypad remain upright.

Focus on Engineering: Plug & Test® Technology



▲ Unique Plug & Test® technology allows for interchangeable sensors to be used with a Mark-10 M7I, M5I or M3I indicator. All calibration and configuration data is saved in the smart connector.



▲ The Plug & Test® connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.

Specifications

Accuracy:	±0.1% of full scale + sensor
Sampling Rate:	14,000 Hz
Power:	AC adapter: 100-240VAC, 50-60 Hz, 0.3 A Battery: Rechargeable 8.4V NiMH Low battery indicator appears when battery level is low, and gauge powers off automatically when power reaches critical stage.
Battery life:	**Backlight on / off:** up to 7 / 12 hours of continuous use
Outputs:	**USB / RS-232:** Configurable up to 230,400 baud. Includes Gauge Control Language 2 for full computer control. **Mitutoyo (Digimatic):** Serial BCD suitable for all Mitutoyo SPC-compatible devices. **Analog:** ±1 VDC, ±2% of full scale at capacity. **General purpose:** Three open drain outputs, one input. **Set points:** Three open drain lines, 40 VDC max., 100 mA DC max.
Configurable settings:	Digital filters, outputs, automatic output (via USB/RS-232), automatic shutoff, default settings, averaging mode, external trigger, passwords, key tones, audio alarms, backlight, calibration.
Weight:	0.7 lb [0.3 kg]
Environmental requirements:	40 - 100°F, max. 96% humidity, non-condensating
Warranty:	3 years (see individual statement for further details)

In The Box



The M7I force / torque indicator is shipped as shown at left, and includes the following accessories:

(1) Carrying case
(1) USB cable
(1) AC adapter
(1) Battery
(1) Certificate of calibration. A combined certificate for the sensor and an indicator is available at time of order, part no. CERT-SI.

Force and torque sensors are available separately.

Ordering Information

Model	Description
M7I	Professional force / torque indicator, 110V
AC1100	Tabletop mounting kit for M7I/M5I/M3I
CERT-SI	Combined certificate of calibration with data, indicator + sensor, calibrated as a set

Alternative AC Adapter Prongs

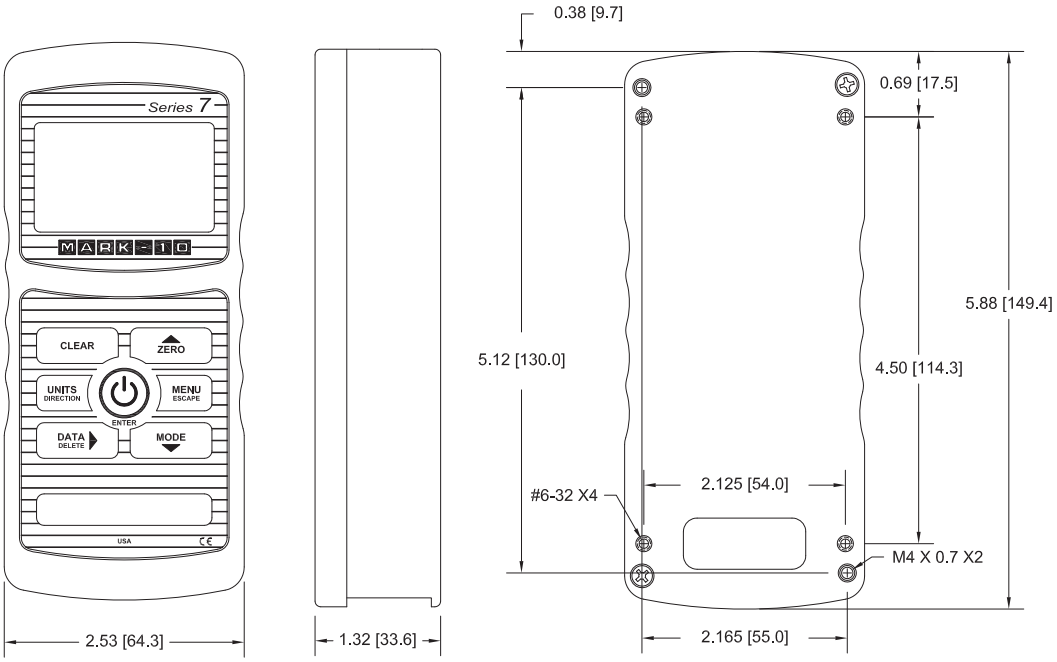


AC1120 AC1121 AC1122

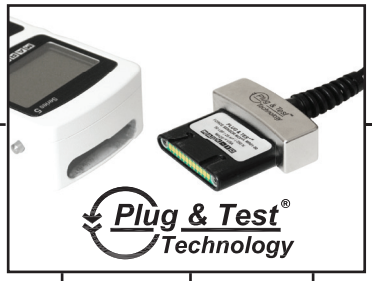
All instruments include a 110V AC adapter with US prong style.
Select an alternative prong adapter (if required) from the table below.

Model	Description
AC1120	Prong for AC adapter, 220V EUR
AC1121	Prong for AC adapter, 220V UK
AC1122	Prong for AC adapter, 220V AUS

Dimensions in [mm]



Models M7I, M5I, and M3I force / torque indicators are designed for use with Mark-10's Plug & Test® remote force and torque sensors. All calibration and configuration data is saved within the sensors' smart connectors - not the indicator - allowing for true interchangeability. Each sensor series is available in a range of capacities, from 0.25 to 10,000 lbF (1 N to 50 kN) full scale and from 10 ozFin to 5,000 lbFin (7 Ncm to 550 Nm) full scale. Refer to individual sensor data sheets for further details.



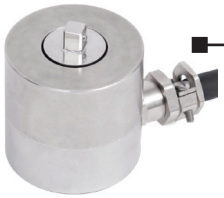
Series R50
Universal torque sensors, fixed chuck



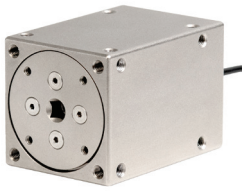
Series R51
Universal torque sensors, interchangeable attachments



Series R55
Torque sensors



Series R52
Static torque sensors



Series R08
Tension / compression force sensors





Model M7I
Professional Indicator

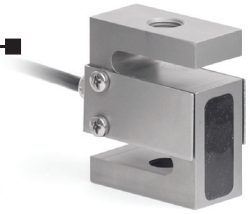


Model M5I
Advanced Indicator



Model M3I
Basic Indicator

Series R01
Tension / compression sensors



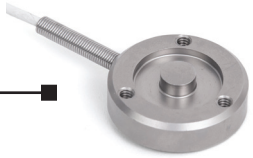
Series R03
Inline tension / compression sensors



Series R04
Miniature tension / compression sensors



Series R02
Compact compression sensors



Series R05
Ergonomics testing push / pull sensors



Series R06
Wire crimp pull sensor

