PIN-TYPE LED BAR GRAPH MOISTURE METER

USER'S MANUAL

MM1E

Please read this manual carefully and thoroughly before using this product.

TABLE OF CONTENTS

INTRODUCTION

Thank you for purchasing General Tools & Instruments' MM1E Pin-Type LED Bar Graph Moisture Meter. Please read this user's manual carefully and thoroughly before using the meter.

The MM1E is designed for applications in woodworking, building construction and home inspection. Examples include:

- Checking for moisture on or below the surface of carpets and sub-flooring
- Measuring the surface moisture content of wood, and drywall before painting/wallpapering, sealing or treating
- Locating water leaks in roofs, floors and walls
- Selecting dry lumber

The meter bases its measurements on the relationship between the moisture content of a material and its electrical conductivity. The wetter a material, the higher its conductivity. The two replaceable steel pins at the top of the MM1E serve as the electrodes of a conductance meter optimized for measuring moisture content. The meter displays measurements in the unit %WME (Wood Moisture Equivalent).

For hard materials like wood, the meter's readings largely reflect surface moisture content because:
1) Moisture close to a surface has a greater effect on a reading than moisture deep below it; and 2) The pins of the MM1E are only 3/8 in. (10mm) long and cannot be driven deep into a hard material. For softer materials like soil, paper or powders, readings are more likely to reflect the average moisture level of the material between its surface and the penetration depth of the pins (normally far less than 3/8 in.).

The MM1E's front-panel bar graph of 10 LEDs measures %WME (Wood Moisture Equivalent) over two different ranges: 7 to 15% (**LOW**), and 16 to 35% (**HIGH**). A slide switch on the back of the meter requires the user to choose the right range for the material under test. The same switch functions as the power switch. Whenever the meter is powered on, the bar graph momentarily indicates remaining battery life. After powering on, the meter's calibration can be checked by inserting the test pins into holes in the pin protection cover.

The MM1E is powered by a "9V" battery included in the blister pack.

KEY FEATURES

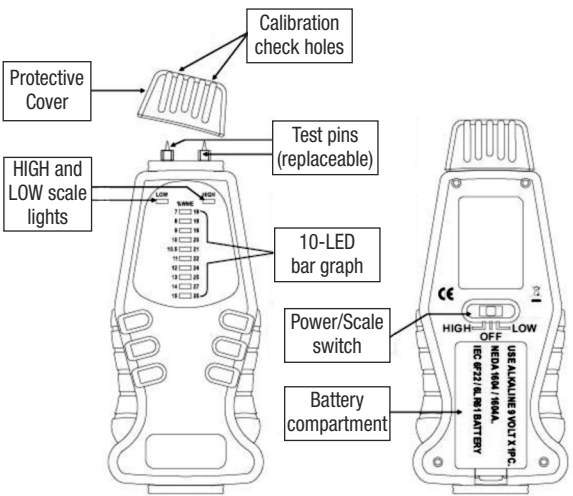
- 10-LED display
- 7 to 35% measurement range, with separate **HIGH** and **LOW** scales
- Protective cap doubles as calibration checker
- Full Battery and Low Battery indications

WHAT'S IN THE BLISTER PACK

The MM1E comes in a plastic blister pack along with a "9V" battery, a protective cover for the test pins and this user's manual.

PRODUCT OVERVIEW

The figure below shows all of the controls and indicators on the front and the back of the MM1E, as well as the location of the battery compartment on the back.



SETUP INSTRUCTIONS

INSTALL BATTERY

To open the battery compartment, turn the meter over and push the flange on the bottom of the battery compartment cover up with your thumb. Lift and remove the cover and set it aside. Plug the included “9V” battery into the wired socket inside the compartment. The terminals of the battery and the socket mate in only one way, with the smaller male terminal plugging into the larger female terminal. Close the battery compartment by replacing its cover and snapping it shut.

OPERATING INSTRUCTIONS

To power on the MM1E, slide the Power/Scale switch on the back of the meter to the **HIGH** position.

Moving the switch should cause some or all of the LEDs on the front panel to illuminate in sequence from bottom to top. If no LEDs light, you can assume that the battery is dead and must be replaced.

The number of LEDs that light corresponds to remaining battery life. If all eight LEDs light, that means the battery is fully charged. If only a few light, the battery is weak and should be replaced soon.

A few seconds after the LEDs light, they will go dark. If most of the LEDs lit up at power on, the **HIGH** LED at upper right will light and remain lit. If only a few LEDs lit up, the **HIGH** light will blink, indicating a weak battery that should be replaced.

To check the calibration of the MM1E, power on the meter by sliding the Power/Scale switch to the **HIGH** position. Remove the protective cap from the top of the meter, taking care not to stab yourself with the two sharp pins beneath the cap. Then turn the cap over and place its two holes over the two pins. If the meter is calibrated, an LED at the 18%, 19%, 20%, 21%, 22% position on the **HIGH** scale will illuminate.

To measure the moisture level of a material, power on the meter into the **HIGH** scale and place the test pins on the material. If it has a moisture level between 16% and 35%, one of the LEDs will light. The number at its right indicates the moisture level in %WME.

If the material's moisture level is higher than 35%, the bottom (35%) LED will light. This indicates that the material's moisture level is beyond the range of the MM1E. If the material's moisture level is lower than 35%, no LED will light.

To determine whether the material's moisture level is lower than 16% or between 16% and 35%, slide the Power/Scale switch on the back of the meter to the **LOW** position. If one LED lights, the number at its left indicates the moisture level in %WME. If no LED lights, the material's moisture level is less than 7% and beyond the measurement range of the MM1E.

Some measurement tips:

1. To locate the source of a leak behind wood, plaster, drywall or a ceiling, make measurements at different locations. The leak is located when the meter displays the highest reading.
2. Never use force to drive the pins into a hard surface.
3. When measuring the moisture level of soil, surface readings will be lower than readings with the test pins deep in the soil.

4. Conductive or metallic objects will always light the lowest LED on the bar graph, regardless of the selected scale.
5. Measurements of wood are skewed by two variables: ambient humidity and the density of the wood species. The best way to compensate for the effect of these variables is to develop your own moisture level curves, based on your experience working with different species of wood on a day-to-day basis.
6. The MM1E has no auto power off function. To avoid discharging the battery, manually power off the meter after each measurement session by sliding the Power/Scale switch on the back to the OFF position.

SPECIFICATIONS

Measurement Range	7 to 35% WME (Wood Moisture Equivalent) over two scales: 7% to 15% (Low) and 16% to 35% (High)
Measurement Accuracy	±1 LED
Pin Length	3/8 in. (10mm)
Calibration Check Point	20% ±2 LED
Low Battery Alarm Level	<7.5V
Operating Temperature	32° to 140°F (0° to 60°C) @<80% R.H.
Storage Temperature	23° to 140°F (-5° to 60°C)
Current Consumption	<15mADC
Dimensions	6.5 x 2.7 x 1 in. (164 x 69 x 26mm)
Weight	3.2 oz. (91g)
Power Source	“9V” battery (included)

REPLACEMENT PARTS

The only replacement parts available for the MM1E are replacement test pins (Part No. PIND4E).

WARRANTY POLICY

General Tools & Instruments' (General's) MM1E Pin-Type LED Bar Graph Moisture Meter is warranted to the original purchaser to be free from defects in material and workmanship for a period of one year. Subject to certain restrictions, General will repair or replace this instrument if after examination it is determined by General to be defective in material or workmanship.

This warranty does not apply to damages that General determines to be from an attempted repair by non-authorized personnel or misuse, alterations, normal wear and tear or accidental damage. The defective unit must be returned to General Tools & Instruments or to a General-authorized service center, freight prepaid and insured.

Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for purchase of this product. In no event shall General be liable for any incidental, special, consequential or punitive damages, attorneys' fees, expenses, losses alleged to be a consequence of damage due to failure of, or defect in any product including, but not limited to, any claims for loss of profits.

RETURN FOR REPAIR POLICY

Every effort has been made to provide you with a reliable product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service Department. If the product is determined to require repair under the General Tools & Instruments Warranty Policy, you will be issued a Return Goods Authorization. The unit will be sent via prepaid freight to the attention of our Service Center at this address:

Remember to include a copy of your proof of purchase, your return address, and your phone number and/or e-mail address.

GENERAL®

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MAN#MM1E 11/29/16