



PINLESS LCD MOISTURE METER WITH TRICOLOR BAR GRAPH

USER'S MANUAL



MMD7NP

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

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INTRODUCTION

Thank you for purchasing General Tools & Instruments' MMD7NP Pinless LCD Moisture Meter with Tricolor Bar Graph. Please read this user's manual carefully and thoroughly before using the instrument.

The MMD7NP is designed for use in woodworking, water damage restoration, building construction and home renovation. Examples include:

- Checking for moisture on or below the surface of carpets and subflooring
- Measuring the moisture content of wood, drywall or masonry before painting, wallpapering, sealing or treating
- Locating water leaks above ceilings, below floors or behind walls
- Selecting dry lumber

The meter is a non-invasive (pinless) instrument that can detect moisture up to 3/4 in. (19mm) below the surface of the following materials: wallboard, masonry, hardwood and softwood. It infers the level of moisture from the material's capacitance, which the meter measures by gauging its effect on an electric field that the meter generates each time it is powered on.

The meter exploits two physical phenomena to make its measurements:

1. The linear relationship between a solid material's moisture level and its dielectric constant—and therefore its capacitance.
2. The so-called fringing-field effect—the slight spreading of the electric field produced by current flowing between two electrodes when both electrodes are on the same side of a material.

Behind the back cover of the MMD7NP are two metal plates. When the meter is powered on, the plates are given small and opposite charges. The potential difference causes current to flow, creating a three-dimensional electric field.

When the back of the meter is placed against one side of a material with moisture on or slightly below its surface, the increased capacitance of the material distorts the electric field to an extent that can be sensed (as a change in flux over the sensing area) and measured. Displayed readings reflect the *average* moisture level of the material between its surface and the electric field's maximum penetration of 3/4 in. Moisture closer to the surface has a greater effect on readings than moisture at the maximum penetration depth.

The MMD7NP has been calibrated at the factory for use with wallboard, masonry, hardwood and softwood. The capacitance of wood and the capacitance of building materials are affected differently by moisture because they have different densities. The meter compensates for density by adjusting the gain of its internal sensing circuitry.

Two buttons on the front of the MMD7NP provide a convenient way to switch among the four materials. The name of the material selected appears on the LCD. Below the LCD is a bank of colored LEDs that roughly mirrors the digital reading above it in bar graph format, with green indicating “dry”, red indicating “wet”, and yellow indicating an intermediate moisture level. An audible out-of-range alarm (beeper) sounds whenever wood is tested and found to have a moisture content above 17% or when drywall or masonry is found to be more than 70% wet.

Although the LCD displays measurements of drywall and masonry moisture content as % readings, these are actually relative readings with no accuracy specification. Despite that shortcoming, relative readings are useful for quickly comparing the moisture levels of materials, or the wetness of different areas of the same material. For example, you can use the meter to locate the source of

a water leak above a ceiling by comparing readings at various points on it. If the ceiling is level, the point that produces the highest reading is below the source of the leak.

Any digital reading can be held by pushing the fourth and final front panel button—the **HOLD** button. This button makes it possible to make a measurement in a dark place and display it after bringing the meter into a lighted area.

To extend battery life, the MMD7NP automatically powers off after two minutes of inactivity. The instrument is powered by a “9V” battery included in the blister pack.

KEY FEATURES

- Separate settings for drywall, masonry, softwood and hardwood
- 2 in. diagonal backlit LCD + 3-color LED bar graph
- Non-invasive technology with 3/4 in. (19mm) maximum sensing depth
- $\pm 4\%$ accuracy on wood
- Auto calibrating
- Reading **HOLD** button
- 2-minute Auto Power Off trigger
- Separate out-of-range alarms for wood and building materials
- Low battery indication
- Powered by “9V” battery

TO MANUALLY CALIBRATE THE MMD7NP


1. Power the meter on and hold it in one hand with the top in the air. Make sure your fingers are not touching or near the inductive sensing area.
2. Press and hold the **HOLD** button until the display reads **101**. Then release the button; this will change the reading to **102**. Wait a few seconds. When the reading changes to **000**, calibration is complete.




PRODUCT OVERVIEW

Fig. 1 shows all of the controls, indicators and physical features of the MMD7NP. Familiarize yourself with their names, positions and functions before moving on to the Setup Instructions.

Fig. 1. The controls, indicators and physical features of the MMD7NP



- A. **HARDWOOD** Mode indicator
- B. **SOFTWOOD** Mode indicator
- C. **MASONRY** Mode indicator
- D. Drywall Mode indicator (**WALL**)
- E.  (Low battery) icon
- F. Moisture level reading, as a percentage
- G. Tricolor LED bar graph


- H.  button: Powers meter on and off
- I.  button: Press to select mode at left of current mode
- J. **HOLD** button
- K.  button: Press to select mode at right of current mode
- L. Held reading indicator
- M. Inductive sensing area
- N. Battery compartment



SETUP INSTRUCTIONS

INSTALL BATTERY

To open the battery compartment, turn the meter over and lift the tab at the top of the battery compartment cover (Fig. 1, Callout N). Remove the cover and set it aside. Then 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 meter, press and hold the  button for at least three seconds. (To power off the meter, follow the same instruction.)

To measure the moisture level of drywall, masonry, hardwood or softwood, press the  or  button until the name of that material appears on the LCD (**WALL** is short for drywall). Then scan the material by gently pressing the inductive sensing area (Fig. 1, Callout M) on the back of the meter against the material. The LCD will read out the material’s moisture content as a percentage.

Simultaneously, one or more bar graph LEDs will illuminate to place the material’s moisture level within a spectrum bounded by “dry” and “wet”. The color of the illuminated LED furthest to the right indicates which % band contains the material (see the Specifications section on p. 7) for the bands’ boundaries.

To hold a reading, press the **HOLD** button briefly. The display will show the held value, along with a lock icon above the % sign. If the reading is above the alarm limit for that material, pressing the **HOLD** button will silence the beeper.

MEASUREMENT TIPS

For maximum accuracy, press the sensing area against a flat area of the material.

Ideally, the material should be at least 3/4 in. thick. That is the meter’s maximum measurement depth and the thickness it is calibrated for. If your sample is too thin, the meter will measure material beneath it as well and produce an inaccurate reading. One way to compensate for thin samples is to stack them.

The sample's length and width should be at least as large as the dimensions of the sensing area: 1.6 x 1.6 in. (40 x 40mm).

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.

SPECIFICATIONS

Measurement Ranges	0 to 53% for softwood 0 to 35% for hardwood Relative readings for wallboard and masonry
Measurement Accuracy	±4% for hardwood and softwood
Maximum Sensing Depth (in wood)	3/4 in. (19mm)
Inductive Sensor Size	1.5 x 1.5 in. (38 x 38mm)
Out-of-Range Alarm Levels	>17% for wood >70% for drywall and masonry
LCD Size	2 in. (51mm) diagonal with three 0.5 in. (13mm) high digits
Display Resolution	1%
Bar Graph Composition	3 each green, yellow and red LEDs
LED Bands	For drywall and masonry: green = 0 to 30%, yellow = 31 to 70%, red = >70% For wood: green = 5 to 14%, yellow = 15 to 17%, red = >17%
Auto Power Off Trigger	2 minutes of inactivity
Operating Temperature	32° to 104°F (0° to 40°C) @ 5 to 95% R.H.
Storage Temperature	14° to 122°F (-10° to 50°C)
Dimensions	6.7 x 2.9 x 1.2 in. (170 x 75 x 30mm)
Weight	5.4 oz. (152g) without battery
Power Source	(1) "9V" battery

WARRANTY INFORMATION

General Tools & Instruments' (General's) MMD7NP Pinless LCD Moisture Meter with Tricolor Bar Graph 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, the company determines it 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, or for any cost, attorneys' fees, expenses, or 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 to obtain an RGA (Return Goods Authorization) number before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

General Tools & Instruments

75 Seaview Drive Secaucus, NJ 07094-1806 212-431-6100

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

GENERAL TOOLS & INSTRUMENTS

75 Seaview Drive Secaucus, NJ 07094-1806

PHONE (212) 431-6100 FAX (212) 431-6499 TOLL FREE (800) 697-8665

e-mail: sales@generaltools.com www.generaltools.com

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Specifications subject to change without notice

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