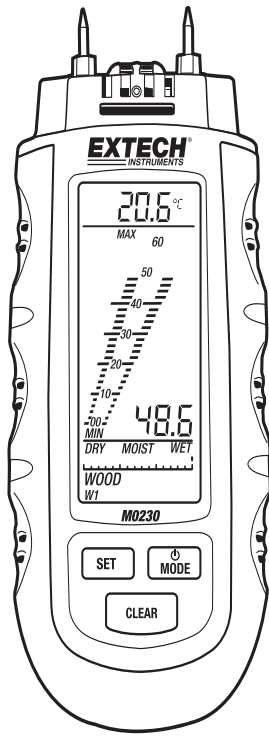


# User Guide



# Moisture Meter

## Model MO230



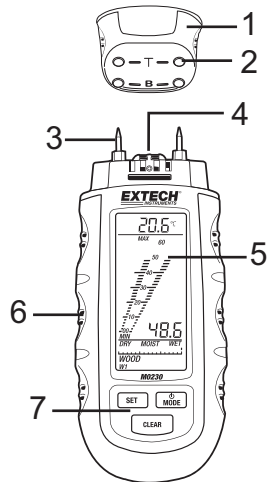
## Introduction

Congratulations on your purchase of the Extech MO230 Moisture Meter. The MO230 detects moisture in wood and building materials such as wall board, sheet rock, cardboard, paper, mortar, and plaster. Additionally, the meter measures Relative Humidity (RH) and Temperature. Careful use of this meter will provide years of reliable service.

## Description

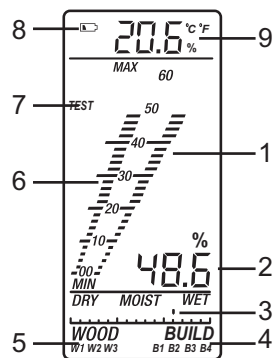
### Meter Description

1. Protective Cap
2. Test Point pairs
3. Measurement electrode pins
4. Temperature and RH sensors
5. LCD
6. Hand grips
7. SET, CLEAR, and MODE/POWER buttons



### Display Description

1. Measured value scale
2. Measured value
3. Relative Dry-Moist-Wet scale
4. Building mode and groups
5. Wood mode and groups
6. MAX value scale
7. TEST mode icon
8. Battery Status Indicator
9. Temperature or Relative Humidity display



Note: The LCD screen is optimized for a 30 degree viewing angle.

# Operation

**CAUTION:** The electrode measurement pins are extremely sharp; Use care when handling. Cover the pins with the protective cap when the instrument is not in use.

## Getting Started

1. Remove the protective cap to expose the electrode measurement pins.
2. Press and hold the power button for 2 seconds to switch the meter ON. The ambient temperature will display and then the display will switch to the moisture measurement mode.

Note: To conserve battery life, the meter automatically shuts off after 3 minutes.

## Measuring Temperature and Relative Humidity

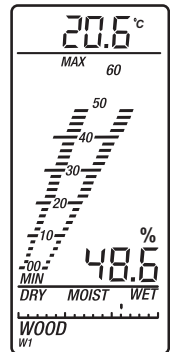
The MO230 measures ambient temperature and relative humidity via the built-in sensors at the top of the meter. The ambient temperature is used as a temperature compensation utility for moisture measurements.

1. The temperature or humidity reading is shown at the top of the LCD display window.
2. Press and hold the SET button for 2 seconds to switch from temperature display to humidity display.

Note: Refer to the programming section of this guide for instructions on switching the temperature units of measure ( $^{\circ}\text{C}$  /  $^{\circ}\text{F}$ ).

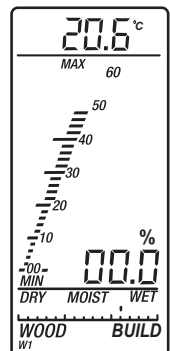
## Measuring Moisture

1. The MO230 measures moisture via the pins affixed to the top of the meter.
2. Carefully push the electrode pins as far as possible into the material under test. The pins should be inserted into wood perpendicular to the wood's fiber structure.
3. Take several readings in several locations on the material for the best representation of the amount of moisture present.
4. Read the measurement values on the display. Readings are represented in %. The measurement range for wood is 1 to 75%. The measurement range for other building materials is 0.1 to 24%.
5. Replace the protective cap when finished.



## Maximum (MAX) reading Indication

The bargraph on the left side of the LCD display indicates and holds the highest reading encountered during a measurement session. Use the CLEAR button to reset the MAX reading indication.



## Measurement Modes

There are three (3) measurement modes. Momentarily press the MODE button to step from one mode to the next:

- WOOD MEASUREMENT MODE (WOOD GROUPS W1, W2, W3)
- BUILDING MEASUREMENT MODE (MATERIAL GROUPS B1, B2, B3, B4)
- SELF TEST MODE (TEST)

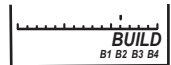
### Wood Measurement mode

Momentarily press the MODE button to select the Wood Measurement Mode. Use the SET button to choose the desired wood group (W1, W2, W3) (refer to the Wood Group Table in the Appendix).



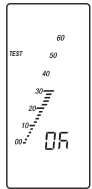
### Building Material Measurement Mode

Momentarily press the MODE button to select the Building Measurement Mode and use the SET button to choose the desired building material group (B1, B2, B3, B4). (refer to the Building Material Group Table in the Appendix).



### Self Test Mode

Momentarily press the MODE button to select the Self Test Mode. Touch the measurement pins to the test points labeled 'T' on the protective cap. The display will read OK if the test passes (30 units  $\pm 2$ ) or it will display dashes if the test fails. Next, touch the measurement pins to the test points labeled 'B'. The display will read OK if the test passes (60  $\pm 2$ ) or it will display dashes if the test fails. If tests are failing please return the unit for repair or replacement.



### Dry/Wet Indication

Moisture reading will also be displayed on the user defined wet-moist-dry display. Setting the range of the display is described in the programming section.

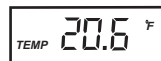


## Programming Menu

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The programming menu offers five configurable parameters. To access the menu, turn the meter on, then simultaneously press and release the SET and CLEAR buttons.

Once in the programming menu, use the MODE button to step through the parameters and also to exit the mode.



### Material Temperature Offset

The first parameter in the programming menu is the material temperature offset feature. Use the SET button to increase the temperature value and use the CLEAR button to decrease the temperature value.

Material moisture measurements can be dependent on the temperature of the material. This meter automatically compensates for material temperature changes by measuring ambient temperature. The temperature offset allows for adjusting the temperature reading when the material measured is not at ambient temperature.. Note: the temperature reading will return to normal when the meter is turned off.

### DRY/WET Scale

The second and third parameters in the programming menu set the lower and upper range of the Dry-Wet scale. This relative scaling allows the user to specify what value is considered a DRY reading and what value is considered a WET reading. The values can be programmed from 0000 to 0999 (999=99.9%). Use the SET button to increase the displayed value and use the CLEAR button to decrease the displayed value.

### LCD Backlight Modes

The fourth parameter is the LCD backlight configuration. There are three (3) LCD backlight modes: AUTO, ON, and OFF. In AUTO mode, the backlight switches ON and OFF automatically according to use. In the ON mode, the backlight is always ON. In the OFF mode, the backlight is always OFF. The default setting is the AUTO mode. Use the SET button to select the mode.

### Temperature units of measure (°C / °F)

The fifth mode is the temperature unit selection. The units of measure for ambient temperature and material compensation can be set to either °C or °F. The setting is stored and remains in effect until it is changed manually. Use the SET button to toggle the units.

## Maintenance

- Always keep the instrument dry
- Prevent dirt from accumulating at the electrode pins

### Electrode Pin Replacement

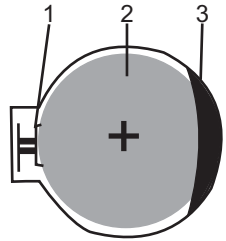
To replace the two electrode pins:

1. Remove the protective cap
2. Unscrew the electrode pins
3. Install the new pins
4. Replace the protective cap

## Battery Installation and Replacement

If the instrument does not switch on or if it displays the low battery symbol, replace the batteries:

1. Remove the Phillips head screw at the rear of the instrument and remove the battery compartment cover.
2. Install new batteries (2) by placing the edge of the battery under to lip (3) and pressing the battery until the latch (1) locks the battery in place.
3. Observe the correct polarity when installing batteries.
4. Remove old batteries by pressing the latch (1) and allowing the battery to pop out.
5. Replace and secure the battery cover.



Note: Do not mix old and new batteries, always replace all three batteries.



You, as the end user, are legally bound (**EU Battery ordinance**) to return all used batteries, **disposal in the household garbage is prohibited!** You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

**Disposal:** Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

## Specifications

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|                         |  |
|-------------------------|--|
| Measurement Principle   | Electrical resistance                          |
| Display                 | LCD  |
| Measurements            | Moisture, Relative Humidity and Temperature    |
| Moisture Range          | Wood: 0 to 75%; Building materials: 0.1 to 24% |
| Relative Humidity Range | 0 to 100%                                      |
| Temperature Range       | -40 to 70°C (-40 to 158°F)                     |
| Electrode length        | 8mm (0.3")                                     |
| Electrode pins          | Integrated, replaceable                        |
| Auto Power OFF          | After 3 minutes                                |
| Power supply            | Three (3) CR-2032 button cells                 |
| Operating Temperature   | 0 to 40°C (32 to 104°F)                        |
| Operating Humidity      | 85% Relative Humidity maximum                  |
| Housing material        | Impact resistant plastic                       |
| Dimensions              | 159 x 63.5 x 30.5mm (6.25 x 2.5 x 1.2")        |
| Weight                  | 100g (3.5 oz)                                  |

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# Appendices

## Wood Groups

| W1                           | W1                     | W2                          | W3                            |
|------------------------------|------------------------|-----------------------------|-------------------------------|
| Abachi                       | Agda                   | Mahogany                    | Afromosia                     |
| Abura                        | Maple                  | Pine                        | Rubber tree                   |
| Pear wood                    | Alder                  | Cherry wood                 | Imbuia                        |
| Black Afara                  | Patagonian cypress     | Kosipo                      | Kokrodua                      |
| Parana pine                  | Purpleheart            | Larch                       | Niove Bidinkala               |
| Beech                        | Andiroba               | Limba                       | Tola-real,red                 |
| Dabema                       | Aspen                  | Cherry mahogany             | Cork                          |
| Ebony                        | Balsa                  | Meleze                      | Melamine particle board       |
| Oak,red                      | Basalocus              | Poplar (all)                | Phenolic resin particle board |
| Oak,white                    | Tree Health            | Plum wood                   |                               |
| Ash                          | Ebiara                 | Pine                        |                               |
| Yellowheart                  | Birch                  | Red sandalwood              |                               |
| Ash-American                 | Logwood                | Elm                         |                               |
| Ash-Japanese                 | Juniper                | Maritime pine               |                               |
| Hichory-silver poplar        | Beech-European hombean | English oak                 |                               |
| Hickory-swap                 | Hombeam-white          | Durmast oak                 |                               |
| Ilomba                       | Campeachy              | Tola                        |                               |
| Ipe                          | Aiele                  | Tola-branca                 |                               |
| Iroko                        | Kapok                  | Walnut                      |                               |
| Small-leaved lime            | Douka                  | Western red                 |                               |
| Small-leaved lime - American | Douglas fir            | Cedar                       |                               |
| Mockemut hickory             | Oak                    | White maple                 |                               |
| Niangon                      | Oak-holm               | White birch                 |                               |
| Niove                        | English,dumast         | White beech                 |                               |
| Okoume                       | Emien                  | White poplar                |                               |
| Rosewood                     | Alder-red,black        | Swiss pine                  |                               |
| Rio rosewood                 | Ash                    | Common aspen                |                               |
| Common beech                 | Yellow birch           | Damson wood                 |                               |
| Red oak                      | Southern yellow pine   | Cypress,red                 |                               |
| Teak                         | Hombeam                | Fibre board                 |                               |
| Willow                       | Hickory-silver poplar  | Wood fibre insulating board |                               |
| White oak                    | hickory-poplar         | Wood fibre hardboard        |                               |
| Cedar                        | Izombe                 | Kauramin partide board      |                               |
| Cypress - C. Lusit           | Guanandi               | Paper                       |                               |
| Board                        | Jarrah                 | Textiles                    |                               |
| Chestnut-sweet, red          | Elm                    |                             |                               |
| African                      | Karri                  |                             |                               |

## Building Material Groups

| B1             | B2               | B3                  | B4       |
|----------------|------------------|---------------------|----------|
| Gypsum plaster | Aerated concrete | Sand/Cement top mix | Concrete |