

# M70-D Digital Moisture Meter

## Instruction Manual

### Introduction

**M70-D** Digital Moisture Meter with the newest ergonomics design, and its special shape, easy operating and reading angle make it more beautiful. M70-D is a moisture meter applied in every kind of industry; it can be used to measure the moisture (%) in the process from raw material to finished products, and the measured material including wood, bamboo, construction material, paper...etc. And it also can be used to measure the relative moisture of other materials like food, leather, powder, cloth, ceramics, cement...etc.

### 1. Features

- Digital LCD display with luminescence back-light.
- Aesthetics protection cap for safe carrying and operating
- Harden and gloss treatment on display-window for abrasion-proof and long-term clean
- 5.5% to 99.9% moisture range with DC 0~1V output
- Stores up to 99 readings, Max./Min average values recalled
- Auto temperature compensation and internal calibration
- Auto power off and low battery warning(with audible)
- Ergonomics design, easy operating, comfortable and durable.
- CE** and **RoHS** approved

### 2. Instrument Description



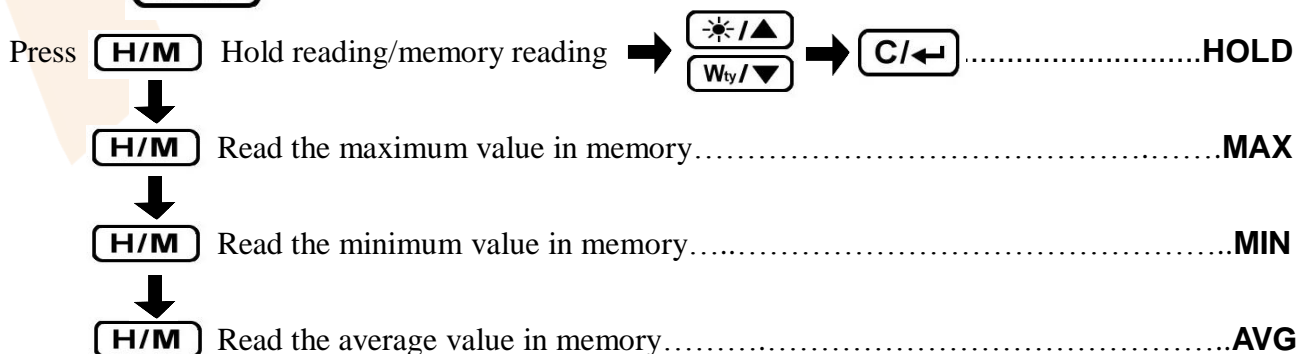
- ① Protection Cap
- ② LCD display ( with Back-light )
- ③ **H/M** key
- ④ **C/←** key
- ⑤ **⏻** key ( power )
- ⑥ Signal output
- ⑦ CAL calibration key
- ⑧ **\* / ▲** key
- ⑨ **Wty / ▼** key
- ⑩ External probe connecter
- ⑪ Needle ( Electrode for measuring )
- ⑫ Instrument model no. and S/N. no.
- ⑬ Battery cover

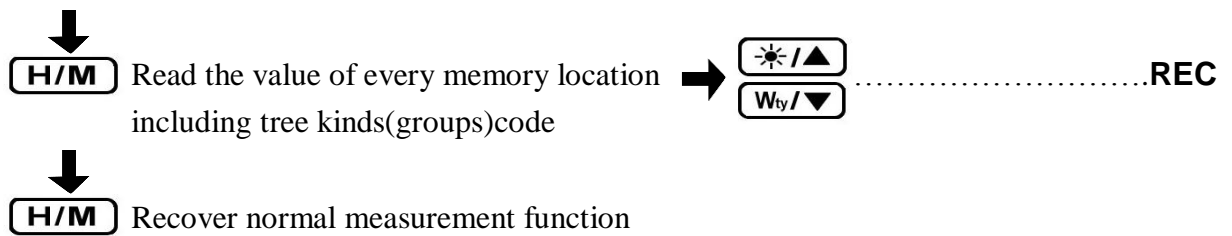
※ Please read the content below for the detail operation and function.

### 3. Key Description

Key	Function	Description	LCD display
	Power key	<ul style="list-style-type: none"> <li>● Press one time for power on or off (auto power off)</li> <li>● When power off, hold <b>H/M</b> then press  to turn on and process manual operating model.</li> </ul>	
<b>H/M</b>	A. (HOLD) Hold value, max./min. and average value. €	As below : <b>H/M</b> key operating and Function description.	HOLD → MAX → MIN → AVG → REC
	B. Enter memory reading		REC
	C. Manual power off function	<b>H/M</b> +  : as above	M
<b>C/←</b>	A. Process instrument calibration function	<b>C/←</b> +  : When power off, press <b>C/←</b> and hold, then press  to turn on and enter calibration function. ※Unavailable to auto power off while calibration function is processing.	CAL
	B. Process reading storage function	Hold the present value and select memory location, then press this key to process storage.	HOLD
	C. Process deletion all memory function	Hold this key over 1.5 seconds to delete all memory data.	Display memory volume 「00」
	A. Turn on LCD back-light function	Hold this key over 1.5 seconds to turn on back-light	●)))
	B. Memory location back search function	Press the key one time to move back a memory location; hold this key to further search location speedily	Display memory location 「XX」
<b>Wty/▼</b>	A. Tree kinds or measured material groups selection function	Press this key to select 1~9 tree kinds groups (please refer to the calibration table) or built material coefficient reference code	Display group code 「X」
	B. Memory location front search function	Press this key one time to move front a memory location; hold this key to further search location speedily	Display memory location 「XX」

Remark : **H/M** key operation and function description (circle operating)      Display symbol





## **4. Operating Instructions**

### **A. Preparation**

A-1 Please check all accessories of the instrument before using :


- ◇ Main instrument-----NO.M70-D x 1 pc
- ◇ Protection cap (on the instrument)-- -----NO.713M x 1 pc
- ◇ External needle type probe-----NO.7021 x 1 pc
- ◇ Replacement standard needle -----NO.701P/S x 2 pc
- ◇ Replacement needle screw-----NO.702B x 2 pc
- ◇ Soft portable leather case-----NO.765Cx 1 pc
- ◇ 9V battery (option)-----NO.B09V x 1pc
- ◇ Instruction manual (including wood calibration tables)-----1 ea



A-2 Set battery :

Press the round mark on the instrument battery cap and push the cap below and set the batteries by ⊕ ⊖ polarity and push back the battery cap.

A-3 Take away the protection cap front the instrument to show the needle and inspect the shape of needle and its firmness.

A-4 Power on and power model :

Auto power off model→ press  to turn on the instrument, if there is no any operation within 1 minute, it will turn off automatically.

Manual power off model→ When power off, hold **H/M** and press  to turn on and the instrument will process manual power off model, except for pressing  and power out off, the instrument will not turn off automatically.

**※ Whatever auto/manual power off model, just press  for power off.**

### **B. Measurement method**

B-1 Finish the power on steps as above, please check the battery power indicator to sure the power is enough and it is available to process moisture measurement and every function operating.

B-2 Use the front two needles to stab into the measured material to read the moisture of material on the display.

B-3 If the condition is difficult to operate or needs long needle to measure deeply, please use the extension probe (No.7021) to connect the right side outlet of the instrument for measuring.

**※ The reading value of same object measured by extension probe and needle is equal**

### **C. Record function operating**— use **H/M** as the operation below:

C-1 Reading value hold function ( **HOLD** )

When get reading value at B-2 step, press one time to hold the value on the display

#### C-2 Maximum reading value function (MAX)

Press the key twice in the normal model to read the maximum value and the memory location

#### C-3 Minimum reading value function (MIN)

Press the key thrice in the normal model to read the minimum value and the memory location

#### C-4 Average reading value function (AVG)

Press the key four times to read the average value and the memory records

#### C-5 Memory reading function (REC)

Press the key five times in the normal model to enter the memory reading function for recalling the memory location and data records including tree kinds and groups data.

※ Press **[H/M]** again, and it will return to the normal model

#### C-6 Reading records function

When the measured value is hold, it is able to use **[☀/▲]** **[W<sub>ty</sub>/▼]** to select the required record no. location, and then press **[C/←]** to record the measured value in the no. location you selected

※ When the selected memory location has been used, the new data will replace the original data. This instrument has 99 records volume and 8 groups display function

#### C-7 Records deletion function

In the measured model, hold **[C/←]** and await the memory volume display「00」to delete the storage data

※ The data in the memory only can be deleted by (C-7) step, and it will not disappear because of power off or power out off

### D. Tree kinds (groups) selection

In the normal model, it is able to use **[W<sub>ty</sub>/▼]** to select tree kinds (or groups) for getting the more accurate moisture value. The selected tree kinds (or groups) symbol will display on the LCD below

※◆ This instrument has 8 groups of tree kinds(groups), available to press for circle selection  
◆ Every time turn on, tree kinds(groups) will be set at NO.1. The tree kind(group) before turning off will not be recorded

### E. LCD Back-light function

On : In the normal model, press **[☀/▲]** over 1.5 seconds to turn on back-light

Off : When back-light is on, press **[☀/▲]** over 1.5 seconds to turn off back-light

※ If there is no any operation with in 30 seconds, back-light will be turned off automatically when back-light is on  
※ Back-light function will deplete power speedily, if it is not necessary, please don't use back-light as possible

### F. Calibration and adjustment function

This instrument has been adjusted completely before ex-factory. If the condition is special and

needs to adjust the instrument, please operate the instrument as the steps below

F-1. When the power is off, hold **CI←** firstly, and then press **⏻** to turn on, 「**CAL**」 will appear on the display left below and the instrument will make a voice “Be” every 4 seconds, it represents the instrument is in the adjustment model.

F-2. Please use the small  $\ominus$  type screw driver to do fine-tuning on “CAL” at the right side of the instrument to display the value and get the calibration value.

F-3. When calibration is finished, please turn off the power to store data.

- ◆ Before calibrating, please check if the power is enough and then process the calibration
- ◆ If you don't know if the instrument needs to be adjusted, please contact our technical department firstly and don't change any original setting.
- ◆ The built-in calibration value of this instrument is  $18.4\% \pm 1\%$ 。

## **G. Power inspection function**

The display left above has a power indicator symbol, if the power is not enough, the symbol will flash and make a voice “Be” warning by fits and starts. Please replace the new batteries immediately and then operate the instrument

## **5. Signal Output**

This instrument has synchronal output function, and it can be used to connect the related peripheral device like a recorder, controller, PC Data-Logger.....etc.

※output signal : DC 0 ~ 1V , 10mV / %

## **6. Care and Maintenance**

1. This instrument has the accurate temperature compensation function, but, if it is used in the place with high temperature or high humidity, it will produce deference or error message.
2. The sensor (needles) is the electric conduction elements of connecting the measured material. In order to avoid damage to the instrument and electric shock, when the measured material has voltage or static electricity, please clear the voltage or cut off the power and then go to measure.
3. Please use the two needles to pierce into the material at the same time and keep them for a while to get the more accurate value.
4. For the hard material or the material need deep inspection, please change to use the special needle (option)
5. To avoid the incorrect reading, if the low symbol appears, please replace the battery before using
6. The sensor (needles) is the main element, if the sensor has damage or other problems, please replace the new one to use continually.
7. When not in use, please remove the battery from the instrument, put the main instrument and all accessories into the protection case and keep the kit in a dry, dust-free environment out of direct sunlight.
8. Please contact the local agent or our customer service department for any question or product repair.

## M70-D Specification:

<b>Measuring Range</b>	5.5 ~ 99.9% <i>H2O %WME</i>
<b>Resolution</b>	0.1 %
<b>Accuracy (at 25°C)</b>	± 1% Wood scale
<b>Display</b>	Digital dual LCD display, With multi.-function indicator.
<b>Sampling Rate</b>	0.3 seconds
<b>Wood group scales</b>	select from 9 wood groups
<b>Data memory</b>	99 readings
<b>Signal output</b>	Analog DC 0 ~ 1V (10 mV / 1%), load > 500Ω
<b>Calibration</b>	Built-in calibration adjustment.
<b>Functions</b>	<ul style="list-style-type: none"> <li>※Back-Light luminescence EL</li> <li>※Data-Hold , Records Max./ Min. and Average values.</li> <li>※Manual / automatic power off.</li> <li>※Automatic temperature compensation.</li> <li>※Battery symbol and low power warning.(with audible)</li> <li>※Usable and changeable of extension probe.</li> </ul>
<b>Power</b>	One 9 V (6F22) Battery, about 250 hours for continuing use(none back light)
<b>Operating</b>	- 20° ~ + 55°C, <90%RH, non-condensing
<b>Dimensions</b>	153 x 56 x 32mm. (6.0" x 2.2" x 1.26" )
<b>Weight</b>	155g. ( 5.5ons) Including battery

## Calibration Tables

(For Wood)

01	02	03	04	05	06	07	08
Pacific maple	Japan china fir	Europe fine-grained wood	Britain elm tree	Quassia	Bodhi tree	Christmas tree	Europe birch
The torrid zone balsa wood	Japan elm	Camphor tree	White elm tree	Hickory tree	Persimmon tree	Pomegranate tree	India China fir
Yellow birch	Douglas fir wood	West America redwood	New Zealand pine wood	West American fallen leaf pine	Amboyna	Rubber tree	Africa redwood mahogany padauk
Yellow poplar	Southern ocean rubber wood	Chestnut tree		Padauk	Alive tree		Europe cherry wood
Africa cypress	American redwood	Japan cypress 18~28mc		Fig tree			Japan cypress 8~18mc
American red rubber wood	Africa alive tree	Green hard hardwood		Teak tree			Japan spruce 8~18mc
Oak	Southern ocean pine	West American hemlock spruce					Africa walnut tree
Scotland pine	Japan pine	Philippine mahogany					
Yellow pine		Fallen leaf pine					
Europe redwood		Malaysia oak					
American walnut tree		American pine tree					
		Korean pine					
		Japan spruce 18~28mc					
		Europe spruce					
		Europe walnut tree					
		Yew					