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Introduction

Congratulations!

You have purchased one of the most accurate moisture measurement instruments for wood in the world. Using patented electromagnetic wave technology, Wagner hand-held meters have been proven by universities and institutes worldwide to provide superior measurement results.

Utilizing an electro-magnetic field, your Wagner moisture meter measures a relatively large cross-sectional area each time you take a reading, giving you a far better representation than other technologies of the true moisture content of your wood. Pin-type meters do not provide this, only measuring a very small area, and only at a particular depth. Very short, non-insulated pins are especially prone to just reading the surface of your wood.

Your Wagner meter measures the moisture content in a 1.5 inch wide by 2.5 inch long by .75 inch thick area of your wood. This closely

Introduction Continued. . .

approximates the full-thickness cross-section method used when performing the ASTM D 4442-92 Oven Dry lab test for determining moisture content in wood. This ASTM standard (and its international counterparts) is the standard to which all moisture meters for wood are compared for accuracy. Wagner technology has been proven in many studies to provide some of the most accurate results in the industry when compared to this worldwide standard.

The Wagner MMI-1100 Moisture Meter utilizes the latest design features available in moisture measurement technology. It is designed to fit comfortably in a jacket pocket or toolbox, and the MMI-1100 is ideal for anyone who needs an industrial quality tool to inspect wood or wood products for accurate moisture content. It is popular with woodworkers, cabinet and furniture makers, flooring installers, contractors, and quality assurance inspectors.

Other important features of Wagner hand-held meters include:

The “Wood-Friendly”™ MMI-1100 uses advanced electromagnetic wave technology to accurately measure wood moisture content* from 5% to 30% (at settings up to .80 SG), and to a depth of 3/4 inch.

- Useful for inspections on many types of materials, including solid and laminated wood products.
- Selectable wood species setting eliminates complicated and time consuming wood species adjustment corrections.
- Easy to read digital display read-out scaled in 0.1% increments.
- Virtually unaffected by wood temperature or surface moisture.**

*Confirmed in university study- information available upon request.

**Contact Wagner technical support for guidelines when wood is frozen.

Operational Instructions—MMI 1100



On/Off Button:

When the meter is Off, momentarily pressing and releasing this button will cause the meter to turn On, and briefly display the firmware version, then enter Measurement mode.

When the meter is in Measurement mode, and the On/Off button is momentarily pressed and released, it will enter Hold mode to allow the user to “freeze” the moisture content reading. Hold mode is selected when the symbol (\div) appears in the left corner of the display. This is ideal for keeping a moisture reading on the display when you are taking moisture readings in hard-to-reach places. The reading will be “frozen” on the display until you press and release the On/Off button again.

To turn Off the meter, press the On/Off

button for 3 seconds and then release. The meter will also turn itself off automatically when not in use as described in the auto-shutdown section.

Species



Species Button:

The species setting can be changed to compensate for a variety of wood species.

When measuring another species other than the factory default setting of 0.50 Specific Gravity (SG), the species setting needs to be changed. Refer to the “Species Adjustment Table” included with your meter to locate the correct species setting for your wood.

If your material is not listed, refer to the “Species Corrections” portion of this manual. The values entered into the MMI-1100 meter omit the decimal point, so for example the Douglas Fir value of 0.50

MMI 1100 Instructions Continued. . .

would be “50” when programming the Species Setting Value.

Your commonly used species setting values can be written on the meter overlay decal in the space provided using a pencil or non-permanent marker, and erased with a swab dipped in isopropyl alcohol. Avoid using a permanent marker because staining of the decal may occur.

Momentarily pressing, and then releasing the species button once will cause the display to show the current specific gravity setting. Momentarily press, and then release button a second time to enter Change Species Mode, or momentarily press the On/Off button to return to Measurement mode. When Change Species mode has been selected, a blinking colon symbol (:) will appear near the left side of the display. Pressing the Species button

again will increment the selected specific gravity value by 01, or hold the button down to increment by 10. The value will go as high as 100, then will wrap around to 20 and continue incrementing. When the desired setting has been reached, press the On/Off button to store the species setting value and return to Measurement mode.

NOTE: If the species setting value selected is more than 80, the maximum moisture content reading attainable will be lower than 30%.



Mode Button:

The Mode Button changes the operation mode. If the meter has been turned Off, the mode always defaults to Mode 1 after turning power back On.

Modes Continued. . .

View/Change MODES Overview:

When the meter is turned On, pressing the Mode button will cause the current mode to be displayed on the screen.

Momentarily pressing the Mode button again will increment the operating mode selection value. The mode increments until it reaches 7 and then wraps back to 1.

Momentarily pressing the On/Off button will select the mode that is indicated on the Mode screen.

Mode 1 = Measurement Mode



This is the primary operating mode for the meter. When the meter is in this mode, it will display instantaneous Moisture Content (MC) readings of the lumber. The meter

will always default to this mode after power on. Toggling the On/Off button in this mode will alternate between hold mode (to “freeze” the MC reading) and Measurement mode.

Mode 2 = Measure/Store



Figure 1

Measure/Store (see Figure 1) is similar to Measurement mode, except that when the On/Off button is pressed, the reading on the display is stored into memory.

Modes Continued. . .

The display will then momentarily indicate the memory location into which the MC reading is being stored, as shown in Figure 2.



Figure 2

After the memory location is displayed the meter will revert to Measurement mode as depicted in Figure 1, showing the instantaneous MC reading. When the maximum number of readings (50) has been stored in memory, any new reading stored will replace the oldest reading in memory, meaning that the 50 most recent readings are always stored. MC readings below 5.0 are stored as 5.0. Readings above 30.0 are stored as 30.0. All readings between 5.0 and 30.0 are stored as their actual reading.

Mode 3 = Review Mode



A sample Review mode screen is depicted in Figure 3.



Figure 3

When Review mode is first selected, the memory location of the most recently viewed MC reading is displayed momentarily (see Figure 2, previous page).

The MC reading in that memory location will then be displayed momentarily. If you miss the displayed MC reading for that memory location, press the On/Off button again, to return to Review mode.

Modes Continued. . .

If there is no stored reading for the location, the display will indicate:



In Review mode, the On/Off button acts as the “Previous” button. The Species button acts as the “Next” button. This allows you to scroll through the readings that you have stored in memory.

When the Previous button is pressed, the previous memory location and its MC reading is displayed. If the memory location is L:01 (the oldest stored MC reading is here) when the Previous button is pressed, the meter will wrap back to the most recently stored (newest) MC reading. The Next button will increment the memory location and display its MC reading. If the location is the newest, the Next button will

wrap around to the first (oldest MC reading) location.

Mode 4 = View Low Reading.



Figure 4

Selecting Mode 4 will cause the display to show “LO” (see Figure 4) momentarily followed by the lowest reading stored in memory. After momentarily showing the lowest reading, the display will revert back to showing the Mode 4 screen.

Modes Continued. . .

If you miss the displayed low reading, press the On/Off button again, to return to View Low Reading mode.

If there is no stored low reading, the display will indicate:



Mode 5 = View High Reading.



Figure 5

Selecting Mode 5 will cause the display to show “HI” (see Figure 5) momentarily

followed by the highest reading stored in memory. After momentarily showing the highest reading, the display will revert back to showing the Mode 5 screen.

If you miss the displayed high reading, press the On/Off button again, to return to View High Reading mode.

If there is no stored high reading, the display will indicate:



Modes Continued. . .

Mode 6 = View Average Reading.



Figure 6

Selecting Mode 6 will cause the display to show “.A.” (see Figure 6) momentarily followed by the Average of the MC readings stored in memory. After momentarily showing the average reading, the display will revert back to showing the Mode 6 screen.

If you miss the displayed average reading, press the On/Off button again, to return to View Average Reading mode.

If there is no stored average reading, the display will indicate the symbol:



Mode 7 = Erase Data



Figure 7a

When the Erase Data mode is selected, it will first indicate how many memory locations are currently used. The Erase Data mode can then be used to erase all of the stored MC readings. The display will first show the Erase screen as shown in Figure 7a. The Erase screen shows how many

Modes Continued. . .

stored readings are about to be erased. The Erase screen will remain on the display for 3 seconds during which time if the user simultaneously presses down both the Species and the Mode buttons for a period of 1 second, the stored readings will be erased. If Erasure is successful, the display will briefly show the Erase OK screen (shown in Figure 7b),



Figure 7b

and then revert to Mode 1 (Measurement Mode). If the user does not complete the Erase sequence just described, the display will revert to the Mode 1 select screen.

Taking Measurements

In order to take correct moisture content measurements, ensure that the meter's specific gravity (species) setting is the correct one for your

species of wood as listed in the Species Settings Table.*

Be sure to press down firmly on the center of the meter with approximately 3 pounds of force to ensure good sensor plate contact with the wood surface. This is especially important on rough-sawn lumber. Do not take readings where there is a noticeable defect or knot in the lumber.

If there is visible surface moisture or water, wipe off any excess, and let the surface of the wood dry-out for a couple of minutes, then take the reading. If possible, turn the board over and measure the other side. If the thickness of the piece is greater than 1.5 inches, it is a good idea to take measurements on both sides.

If the lumber thickness is less than the scan depth of the meter, an air gap of at least one inch needs to be maintained underneath the wood to prevent erroneous high readings. Ensure that there is nothing (including your hand) under the material you are measuring, especially any metal. The

Taking Measurements Continued. . .

actual moisture sensing area is a 1.5 inch x 2.5 inch rectangle on the meter's backside (opposite side of the display and keypad).

In order to take a valid measurement, this sensing area must be completely covered with the wood or other material you are measuring. If the sensing area is not completely covered, your moisture reading will be inaccurate.

Additional meter corrections may be necessary if you are measuring Raft Wood (salt water permeated), or lumber treated with Copper, Chrome, Arsenic (CCA), or Ammonical, Copper, Quantenary (ACQ).**

*Refer to the Species Settings Table in the supplemental manual provided.

**Contact Wagner Technical Services for further information for these applications.

MMI 1100 Features

Auto-Shutdown:

The meter will automatically shutdown in 60 seconds anytime the meter's moisture content reading has not changed by more than 2%, and the meter buttons have not been pressed. The shutdown timer will reset anytime the meter reading changes more than 2%, or a button has been pressed.

Low Battery Indicator:

If the meter is On, and battery voltage is low, the LO BAT indicator will be shown on the left side of the display. When the LO BAT indicator is on, you must replace the battery or the meter may not function properly. If the battery needs to be replaced, use either a 9-volt alkaline or a ni-cad rechargeable. Be sure to observe proper battery polarity.

Meter Storage

For a long service life, it is important to store your meter properly. Avoid excessively hot

Meter Storage Continued. . .

or cold locations, and keep the meter in the case provided.

Do not store the meter in an area with excessive electro-magnetic interference, such as near an electric motor, or where it could be crushed, such as in front of a forklift. Do not leave the meter in an operating kiln during the drying cycle.

Meter Calibration

The meter has been calibrated at the factory and should not require re-calibration. If you need to have the calibration verified, please contact the Wagner Electronics Sales Department to purchase a calibration verification block if you don't already have one. Should the meter need to have a calibration adjustment, it will need to be returned to Wagner Technical Services Department.

MMI 1100 Meter Specifications

Size:

Length	4 ⁹ / ₁₆ inches
Width	2 ³ / ₄ inches
Height	1 ¹ / ₁₆ inches

Scanning Area:

Length	2 ¹ / ₂ inches
Width	1 ¹ / ₂ inches

Scanning Depth: ³/₄ inch

Weight: 0.37 pounds

Power: 9 volt alkaline or ni-cad
rechargeable

Auto Power Shut Down:

60 seconds

Measurement Range:

5% - 30% MC scaled in 0.1% increments
(up to .80 SG)

Density (SG) Range: 0.20 to 1.00 SG

Operating Temperature: 30 to 110 degrees
Fahrenheit Maximum

MC Reading Storage: 50

FCC Compliance Statement

This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Move the equipment away from the receiver.
- Plug the equipment into an outlet on a circuit different from that to which the receiver is powered.
- If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

CAUTION: Only equipment certified to comply with Class B (computer input/output devices, terminals, printers, etc.) should be attached to this equipment. Finally, any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacture could void the user's authority to operate such equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications compliance statement

This equipment does not exceed class B limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of communications. Operation in a residential area may cause unacceptable interference to radio and TV reception, requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe B d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

Warranty

Wagner Electronic Products, Inc., warrants this product against defects in material and workmanship for one (1) year from the date of purchase, subject to the following terms and conditions:

Wagner's liability under this warranty shall be limited, at Wagner's option, to the repair or replacement of this product or any part thereof, which is demonstrated to be defective. To exercise this warranty, customer must telephone, fax or e-mail Wagner's Customer Service Department for an RMA (Return Materials Authorization) number and factory instructions for shipment. This limited warranty does not apply if the product has been damaged by accident, negligent handling, misuse, alteration, damage during shipment, or improper service. Wagner Electronic Products, Inc., shall in no event be liable for any breach of warranty or defect in this product, which exceeds the amount of purchase price of the product. Wagner Electronic Products, Inc., shall not be liable for incidental or consequential damages for the breach of any express or implied warranty with respect to this product or its calibration.

With proper care and maintenance, the meter should stay in calibration; however, because Wagner Electronic Products, Inc., has no control over the manner in which the unit will be used, it makes no warranty that the meter will stay in calibration for any specific period of time. Wagner Electronic Products, Inc., recommends returning the unit to the factory for a diagnostic checkup and recalibration in the event the meter is dropped or otherwise damaged, or the meter accuracy is suspect.

This warranty is in lieu of all other warranties, whether oral or written, express or implied. Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are excluded. Agents and employees of Wagner Electronic Products, Inc., are not authorized to make modifications to this warranty or additional warranties binding on Wagner Electronic Products, Inc. Accordingly, additional statements, whether oral or written, except written statements from an officer of Wagner Electronic Products, Inc., do not constitute warranties and should not be relied upon by the customer.

This warranty is personal to the customer purchasing the product from Wagner Electronic Products, Inc., and is not transferable.

Repair Service

In the event of damage, failure, or if the unit requires re-calibration, contact the Wagner Electronics Technical Services Department for an RMA number prior to returning it for repair.

The values stored in memory may be lost in the event that the meter is sent in for repair.



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