

SINAR™ TECHNOLOGY MOISTURE PROBE USER MANUAL.

Read all instructions prior to operating your Sinar™ Moisture Probe. Whenever using this unit, remember to follow the appropriate operating procedures.

For your reference/record:

Serial Number:	
Purchase Date:	
Date Registration Card Mailed:	

Moisture Probe. Rev. 2. 11/05
For Version 1.2 software.

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Sinar™ Moisture Probe. Model 6600

The performance of this Moisture Analyser is dependent on the correct use and instrument care by the customer. It is important to check the calibration (both commodity and hardware) periodically and, if necessary, make adjustments following the procedure in this manual. The commodity calibration can be checked by comparing the Moisture Analyser results against reference samples, e.g. oven tested samples (please ensure that tested samples are based on the correct oven test specification).

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1.0 INTRODUCTION.

The Sinar™ Moisture Probe, moisture Analyser houses the latest moisture measuring technology in a compact package. It has been designed to provide fast moisture results using whole grain samples. In addition to % moisture content, the Moisture Probe also measures temperature.

Each instrument is pre-calibrated for up to seven commodities either chosen from a standard package of programmes or selected from the Sinar™ calibration library. The calibration of any product can be optimised using a bias facility.

The Sinar™ Moisture Probe is one of a family of moisture analysers. All models have the facility to transfer and receive calibrations either from each other, via a Sinar™ Acoustic Coupler and telephone link or via the Internet. Similarly new commodities can be transferred or existing calibrations can be updated with new information.

The Sinar™ Moisture Probe has been calibrated using clean samples. Accuracy can be affected by the presence of stones, dirt, weeds, seeds, admixture, chaff or other foreign matter.

Clean the sensor with a soft brush to prevent material build-up on the fins. NEVER USE WATER. Take care not to damage the temperature sensor.

2.0 BASIC PRINCIPLE OF OPERATION

The design concept of the Sinar™ Moisture Probe is based on the simultaneous sensing of capacitance and temperature of the sample being tested, providing a corrected moisture (%) reading in a few seconds. It works accurately on products with a moisture content ranging from approximately 1% to 35% depending on the application.

The instrument incorporates 2 sensors:

1. Capacitance

The moisture in a sample absorbs the electrical energy between the sensor fins. The electrical signal known as "Capacitance" increases with the moisture content of the sample.

2. Temperature Correction

The capacitance of a sample increases with temperature. A temperature sensing thermistor is mounted in the sample cell and the microprocessor carries out an automatic correction.

Sinar™ refer to a capacitance reading corrected for temperature as a code 0 reading.

3.0 OPERATING INSTRUCTIONS

Hold the display unit in one hand. Hold the spear via the black “mushroom” cap in the other hand. Select the required crop as detailed below. Insert the spear into the crop to be measured ensuring that the black sensor fins are completely covered. Proceed as detailed below.

3.1 TAKING A SINGLE MOISTURE CONTENT READING.

Display shows.

Switch on I

- HI -

Select channel 1-7 e.g. 2.

☐ 2

Press %H₂O button. Moisture content will be displayed after 5 seconds.

14.5

3.2 TAKING CONTINUOUS MOISTURE CONTENT READINGS.

Display shows.

Switch on I

- HI -

Select channel 1-7 e.g. 2.

☐ 2

Press and hold %H₂O button.

LOG

Display shows.

After approx. 5 seconds the unit will display a moisture reading. The reading is updated every 4 seconds.

14.5

To end continuous mode, proceed as follows:-

Press and hold **%H₂O** button.

-LOG

3.3 MEASURING SAMPLE TEMPERATURE.

Sample temperature can be measured by pressing the **TEMP** button when the sample is covering the sensor. If the sample temperature is very different from the ambient temperature, leave the sample for 30 seconds before you press **TEMP**.

Alternatively, keep on pressing the **TEMP** button, until a stable temperature is displayed.

Display shows.

Press **TEMP** button.

□ 21.0

3.4 USING THE AVERAGE MOISTURE CONTENT FACILITY.

A maximum of 254 samples can be averaged. If the **AVER** button is held down, the display will show the number of measurements that have been made, e.g.

Press and hold **AVER** button.

□ 3

When this key is released, the average % moisture content will be displayed, e.g.

□ 10.6

The average can be reset to zero by switching the analyser off and on or by changing channels.

NOTE.

If using the average function ensure the sensor is always covered with sample. If a reading is taken with the sensor half covered, the reading will be added to the average stack and affect the accuracy of the final result.



4.0 CALIBRATION ADJUSTMENTS.

4.1 % MOISTURE CONTENT.

Sometimes it is useful to be able to adjust the moisture reading, for instance, when a different oven test is used, or when the particle size of a product is significantly different, or when 2 instruments are checked against each other.


However, before adjusting the moisture reading, check that the hardware settings are correct. (Section. 6.1). Having done this surround the sensor with sample and select the appropriate calibration channel.

The moisture reading may be adjusted for each individual channel


using the up  and down  arrow keys. The adjustment applies to all points of the selected channel.

Determine the average adjustment needed by comparing at least 3 different samples.


Display shows.

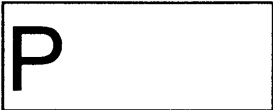
Switch on 



Press and hold  button.



Enter password and press 



Note: The Analyser gives an audible alarm if the wrong password is entered.

Press %H₂O button.

10.9

After 5 seconds the moisture result is displayed.

If the average adjustment needed is +0.3%, press up arrow ▲ key three times so that the display reads:

11.2

Press and hold lb/bu
kg/hl button, this displays the channel number

that has been adjusted. Release the key and the display will show the adjustment that has been made.

Note: When the instrument leaves the factory the password is 123.

In order to check to see whether a channel has been adjusted, proceed as follows:

Display shows.

Switch on I

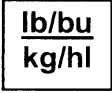
- HI -

Press and hold CAL
AUTO button.

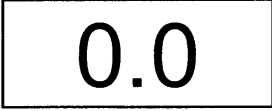
CAL.

Select channel, e.g. 1.

C 1

Press  button.

Display shows.




(0.0 means that no adjustment has been made).

5.0 CALIBRATION TRANSFERS.


5.1 REMOTE ACCESS MODE.

The Moisture Probe can be put into remote access mode or "PLUG" mode. This is a remote mode to enable calibration data to be imported or exported from the Moisture Probe to a PC with the Sinar™ MNET™ (Pt No 1900-6309) software installed. Data can also be transmitted via telephone line using the Sinar™ Acoustic Coupler™ (Pt No 6230-001).

Press and hold the  button

Display shows.

while switching on 





All operations are now carried out via the PC.

5.2 CONTINUOUS MODE.

The following instructions relate to communicating with a Sinar™ AP moisture instrument only. Details of communications with other models are included in their respective user manuals.

5.2.1 SINGLE CURVE TRANSFER.

In order to transfer one calibration to an AP analyser, proceed as follows:

Display Shows.

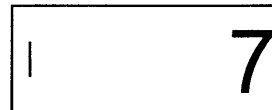
On receiving unit.

A rectangular display box containing a small square icon on the left and the number '1' on the right.Press channel number, e.g. 7 in which
new calibration is to be installed.A rectangular display box containing the number '7'.Press **AVER** button.A rectangular display box containing the text 'IN'.

On the sending unit.

A rectangular display box containing a small square icon on the left and the number '1' on the right.

On the receiving unit.

A rectangular display box containing a vertical bar icon on the left and the number '7' on the right.

After 6 seconds both units will display

A rectangular display box containing the text 'PASS'.

The transfer is now complete. Switch off both units and remove cable.

5.2.2 CURVE SET TRANSFER.

Display shows.

Set both units to display.

COPA

On the sending unit press

%H₂O

OUT

Display shows.

On the receiving unit press

AVER

IN

Sending unit changes to -

OUT

Receiving unit changes to -

IN

When the transfer is completed both instruments will display

PASS

6.0 HARDWARE SECTION.

6.1 CHECKING HARDWARE CALIBRATIONS.

To check that the instrument is in good working order the sensors, (Temperature and Capacitance) should be checked as follows:

Temperature:

Pour the sample around the sensor covering the fins totally. Leave for 30 seconds so that the sample and sensor temperature reach equilibrium.

Check the temperature of grain using an accurate thermometer. Switch on the instrument and press TEMP. The two readings should not differ by more than 1.5°C.





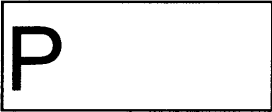





Capacitance:

This is checked using a capacitance reference sample (code 0 sample). Contact your instrument supplier for this sample. Pour the sample around the sensor covering the fins. Press the 0 button and then the %H₂O button. The displayed result should be no greater than ±0.3 from the value of the code 0 sample. The code 0 value is written on the container the sample was supplied in.

If any of these measurements are out of tolerance, the instrument should be recalibrated.

6.2 RESETTING HARDWARE.

Ensure there is no sample around the sensor.

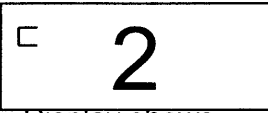
	Display shows.
Switch on 	
Press and hold  button.	
Enter password and press P.	
Press and hold  button.	
Press and hold  until unit beeps.	
	



Surround the sensor with a capacitance reference sample (e.g. 28.1). Allow 1 minute for the sensor and sample temperature to equalise. Enter Reference Value (e.g. 28.1).

Display shows.

Press 2



Display shows.

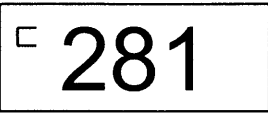
Press 7



Press  once.

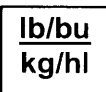
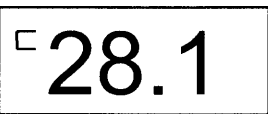


Press 1.



Display shows.

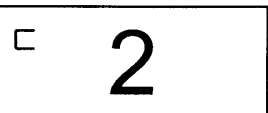
Press

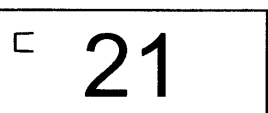
Enter Temperature.

Insert thermometer or temperature probe into grain and note reading, (e.g. 21.0°C).

Press 2



Press 1



Press 0

□ 210

Press TEMP button.

□ 21.0

Display shows.

Press and hold %H₂O until analyser bleeps.

□ 2

= 2

□ 2

This completes the hardware resetting. Now check the temperature and capacitance readings.

7.0 CHANGING DEFAULT SETTINGS.

The following options are available:

- a) Temperature - °C or °F.
- b) Baud rate setting of 300 or 4800.
- c) High or low frequency moisture measurement.

The procedure to change from one default setting to the other is as follows:


Display shows.


Switch on


I

- HI -

CAL.

Press and hold  button.

Enter password and press 



Press  button.



Display shows.

Press  button again.



In this mode the following keys have specific functions:



When this key is held down, the display changes from USA to Euro or vice versa. In Euro units the readings are °C for temperature. In USA units, the readings are °F for temperature.



When this key is held down the baud rate changes from 300 to 4800 or vice versa.

8.0 TECHNICAL SPECIFICATION.

8.1 Display unit.

Dimensions (mm):	H195 x W154 x D33
Display Unit Weight:	0.6 KG
Max. Number of Sensors:	1
Display Unit Construction:	Fabricated aluminium alloy, powder coated.
Operating Environment:	0 to +55 °C.
Storage Temperature:	-20 °C to +55 °C; Humidity to 95% non condensing.
Humidity:	Up to 95% non condensing.
Display:	3.5 character 20mm LCD.
Processor:	Intel 80C31 microprocessor.
Memory:	EPROM and RAM
Calibrations supplied. (Upgradable via the RS232 port).	7
Max. calibration capacity:	7
Data Output Format:	RS232 C, ASCII code, 300 Baud.
Moisture Accuracy:	± 0.5% dependant on application and moisture level.
Readout Interval.	4 seconds.
Temperature Accuracy:	± 1 °C.
Displayed Temperature:	°C or °F
Display Resolution:	1 Decimal place.
Temperature Correction:	Temperature sensor mounted on fin. Correction factor is software programmable. Correction range 0-40 °C.

8.2 Sensor.

Sensor Dimensions (mm):	Ø80 x 380
Sensor Weight:	0.8 KG
Operating Environment:	0 to +65°C.
Storage Temperature:	-20 °C to +80 °C; Humidity to 95% non condensing.
Humidity:	Up to 95% non condensing.