



**SINAR™ TECHNOLOGY
LARGE SEED MOISTURE SAMPLER.
USER MANUAL**

Read all instructions prior to operating your Sinar™ meter.

Whenever using this unit, remember to follow the appropriate operating procedures.

For your reference/record:

Serial Number:	
Purchase Date:	

Rev. 4. 3/12
For Version 1.7 software.

Sinar™ Large Seed Moisture Analyser Model 8100-001

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). Samples can be obtained from your Sinar™ agent.

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1.0 INTRODUCTION.

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

Each instrument can be pre-calibrated with 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 meter is one of a family of moisture analysers. All models have the facility to transfer and receive calibrations from each other, or via e-mail using Sinar™ Calibration software. New commodities can be transferred or existing calibrations can be updated with new information.

The Sinar™ moisture meter 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.

IMPORTANT. PLEASE NOTE

If you have more than one instrument on site, please make sure the display box and the sensor have the same serial number. They must be paired correctly.

BASIC PRINCIPLE OF OPERATION

The design concept of the Sinar moisture meter 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. Changing the batteries.

The moisture meter is powered by 4 AA 1.5V batteries. The batteries are accessed by removing the rectangular cover panel beneath the front panel keypad.

3.0 OPERATING INSTRUCTIONS

Fill the measuring cylinder to the top with seeds. This guarantees the sensor fins will be covered with sample. Proceed as follows:-

3.1 TAKING A MOISTURE CONTENT READING.

Display shows.

Switch on I

- HI -

Select channel 1-7 e.g. 2.

□ 2

Press %H₂O button.

14.5

Moisture content will be displayed in approx. 5 secs

3.2 MEASURING SAMPLE TEMPERATURE.

Sample temperature can be measured by pressing the TEMP button when the sensor is covered with sample. 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

3.3 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  button.



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



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.







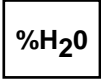

Sometimes it is useful to be able to adjust the moisture reading, for instance, when a different oven test is used, or when the particle size of a product is significantly different, or when 2 instruments are checked against each other.


However, before adjusting the moisture reading, check that the hardware settings are correct. (Section 6.1).

The moisture reading may be adjusted for each individual channel

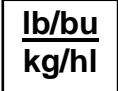
by using the up  and down  arrow keys.

The adjustment is applied to all points of the selected channel. Determine the average adjustment needed. Compare at least 3 different samples.

		Display shows.
Switch on		
Press and hold	 button.	
Press and hold		
a) Surround the sensor with sample. b) Select channel.		
Press	 button.	
After 5 seconds the moisture result is displayed.		

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



Press and hold  button, this displays the ADJUSTED channel number

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

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

Switch on



Display shows.



Press and hold



button.

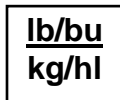


Select channel, e.g. 1.



Display shows.

Press



key



(0.0 means that no adjustment has been made).

5.0 CALIBRATION TRANSFERS.

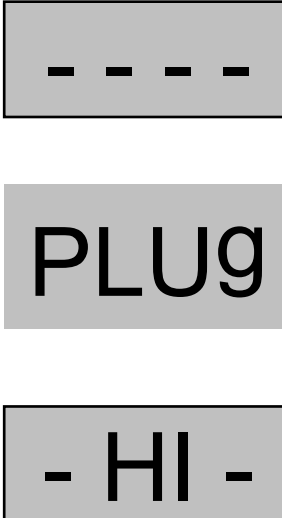
5.1 REMOTE ACCESS MODE.

The moisture meter 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 meter to a PC with the Sinar™ MNET™ (Pt No 1900-6309) or e-mail software installed

Press and hold the **TEMP** button

while switching on **I**

Display shows.



The diagram illustrates the sequence of display screens when entering remote access mode. It starts with a screen showing four dashes (---). The next screen shows the word "PLUG" in large, bold letters. The final screen shows "- HI -" in large, bold letters.

All operations are now carried out via the PC.

5.2.1 SINGLE CURVE TRANSFER.

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

Ensure both units are switched off.

Connect the Sinar™ calibration transfer cable (Pt No 1000-2766) to the RS232 port on the left hand side of the Moisture Analysers.

Switch on both instruments.

Display shows.

- HI -

For both instruments:

Hold down  button.

CAL.

Enter password and press button.

P

P

Press  button.

COPA


By this stage both instruments should be displaying COPA. (This is known as the communication mode).

On the Sending Unit.

Display shows.

Press channel number, e.g. 1, this contains the calibration curve to be transferred to the other analyser.

□ 1

Press  button.

OUT

□ 1

On receiving unit.

Press channel number, e.g. 7 in which new calibration is to be installed.

Press **AVER** button.

On the sending unit.

On the receiving unit.

After 6 seconds both units will display

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

5.2.2 CURVE SET TRANSFER.

Set both units to display.

On the sending unit press **%H₂O**

Display Shows.

7

IN

□ 1

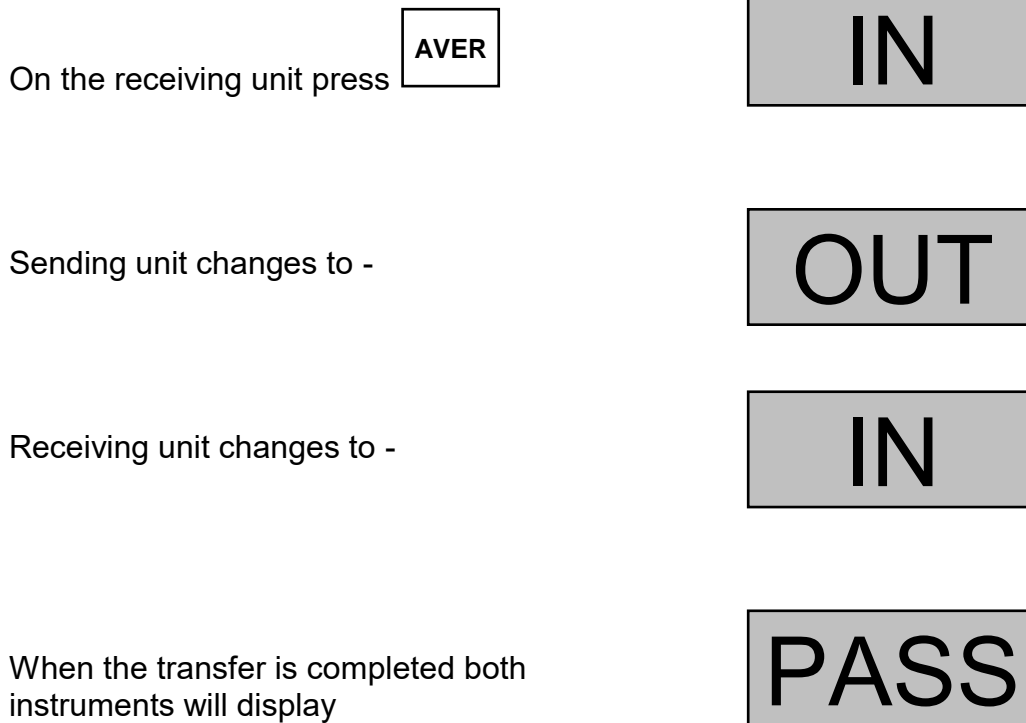
| 7

PASS

Display shows.

COPA

OUT



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 deg C.

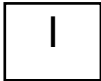










Capacitance:

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.

Switch on		Display shows.	
Press and hold	 button.		
Enter password 226 and press P.			
Press and hold	 button.		
Press and hold	 until unit bleeps.		
			
			

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

□ 2

Press 7

□ 27

Press  once.

□ 28

Press 1.

□ 281

Display shows.

Press

lb/bu
kg/hl

□ 28.1

Enter Temperature.

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


Press 2

□ 2

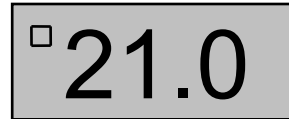
□ 21

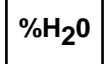
Press 1

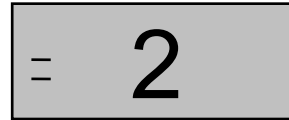
Press 0



Press  button.



Press and hold  until analyser
Bleeps.













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

7.0 CHANGING DEFAULT SETTINGS.

The following options are available:

- Temperature – deg C or deg F.
- Baud rate setting of 300 or 4800.
- High or low frequency moisture measurement.

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

	Display shows.
Switch on 	
Press and hold  button.	
Enter password and press 	
Press  button.	
Press  button again.	

In this mode the following keys have specific functions:

TEMP

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

AVER

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.
Mounting:	2 off M6 x 1.0 bushes in rear face.
Operating Environment:	0 to +55 deg C.
Storage Temperature:	-20 deg C to +55 deg 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 deg C.
Displayed Temperature:	Deg C or degF
Display Resolution:	1 Decimal place.
Power Supply:	4 off AA 1.5V batteries.
Temperature Correction:	Temperature sensor mounted on fin. Correction factor is software programmable. Correction range 0-40 deg C.

8.2 Sensor.

Sensor Dimensions (mm):	Ø100 x 380
Sensor Weight:	1.5 KG
Sensor volume	1.4 litres.
Operating Environment:	0 to +65 deg C.
Storage Temperature:	-20 deg C to +80 deg C; Humidity to 95% non condensing.
Humidity:	Up to 95% non condensing.
Cable Length Supplied:	2 meters.

9.0 SINAR MOISTURE METER ACCESSORIES.

The following are a list of accessories which are compatible with the Sinar™ moisture meter. Please contact your instrument supplier for more details.

Part Number	Title
10002766	Calibration Transfer cable.
19006940	e-Mail Calibration Software
19006309	Moisture Net calibration software. (Without curve library).
19006229	Moisture Net calibration software. (With curve library).
19006362	Data Capture & record logging software.