USER GUIDE
Book 1.
(Modes 0 to 1b).

**Sinar Technology GrainPro Moisture Analyser.
Model 6070-GrainPro.**

Sinar Technology GrainPro
Model 6070-GrainPro Moisture Ananlyser.

1.0   Introduction:

Thank you for choosing the SINAR TECHNOLOGY GrainPro.

The Sinar^{TM} 6070 GrainPro Moisture Analyser houses the latest moisture measuring technology in a compact, portable package. It has been designed to provide fast moisture results using whole crop samples. In addition to % moisture content, the GrainPro simultaneously measures and displays sample density in K/g per hl and sample temperature.

The GrainPro is a battery powered moisture analyser with only one operator mode making the instrument extremely quick and easy to use.

The GrainPro can store up to twenty five different crop calibrations. Contact Sinar Technology or your Sinar agent if your calibration requirements change.

2.0   6070 GrainPro Display Layout.

```
┌─────────────────────────────────────────────┐
│                                               │
│   ┌───────────────────────────────────────┐  │
│   │  0 Reference                        0  │  │
│   │                                        │  │
│   │  Down        Up              Run       │  │
│   └───────────────────────────────────────┘  │
│                                               │
│      ┌────┐   ┌────┐   ┌────┐   ┌────┐        │
│      │ F1 │   │ F2 │   │ F3 │   │ F4 │        │
│      └────┘   └────┘   └────┘   └────┘        │
│                                               │
│   ┌─────┐ ┌─────┐ ┌──────┐ ┌──────┐ ┌──────┐ │
│   │  I  │ │  O  │ │ MODE │ │ CLEAR│ │ ENTER│ │
│   └─────┘ └─────┘ └──────┘ └──────┘ └──────┘ │
│                                               │
│                                               │
└─────────────────────────────────────────────┘
```
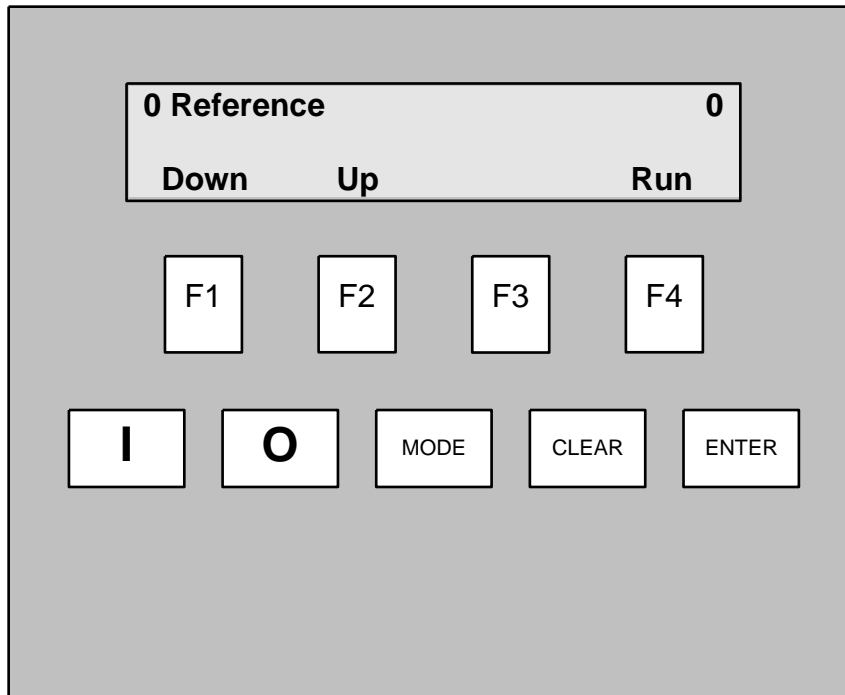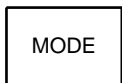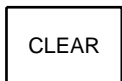
GrainPro front panel layout.

Key Pad Functions.

| F1 | The "F" or function keys action the command shown in the display window above each function key. |

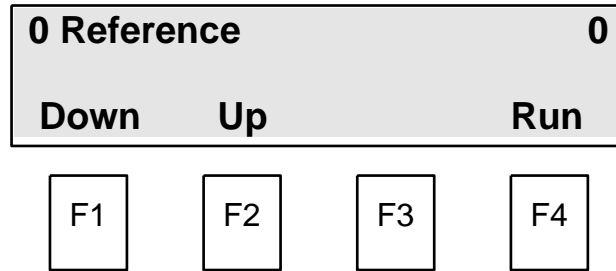| MODE | The "MODE" key is used to step through the user modes, mode 0, 1 and 1b. |

| CLEAR | The "CLEAR" key is used to clear wrongly entered numerical data allowing you to start again. |

| ENTER | The "ENTER" key is used to enter all numerical data. |

3.0   Mode 0, Display Description.

```
┌─────────────────────────────────────┐
│ 0 Reference                       0  │
│                                      │
│ Down      Up              Run        │
└─────────────────────────────────────┘
    ┌─────┐  ┌─────┐  ┌─────┐  ┌─────┐
    │ F1  │  │ F2  │  │ F3  │  │ F4  │
    └─────┘  └─────┘  └─────┘  └─────┘
```

Mode 0 screen.

0 Reference.

Denotes that the 0 reference curve is currently selected. This curve is used when a capacitance, (code 0) reading is required for calibration purposes.

0

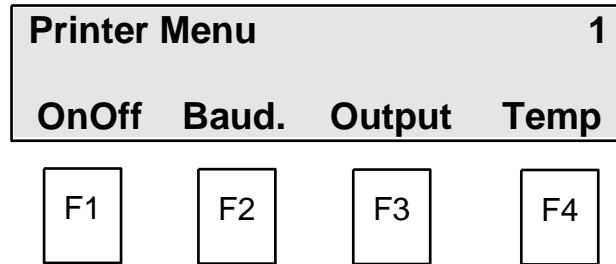Shows the number of the selected mode. Press the MODE key to step through the modes.

Down/Up (F1 & F2).

Used to step through the crop calibrations (curves) installed in the GrainPro.

Run. (F4).

Used to take a moisture reading.

4.0   Mode 1, Display Description.

```
┌─────────────────────────────────────┐
│ Printer Menu                       1 │
│                                      │
│ OnOff   Baud.   Output   Temp        │
└─────────────────────────────────────┘
    ┌────┐   ┌────┐   ┌────┐   ┌────┐
    │ F1 │   │ F2 │   │ F3 │   │ F4 │
    └────┘   └────┘   └────┘   └────┘
```

Mode 1 screen.

Printer Menu

Denotes: Printer Menu has been selected.

1

Shows the number of the selected mode. Press the MODE key to step through the modes.

OnOff (F1).

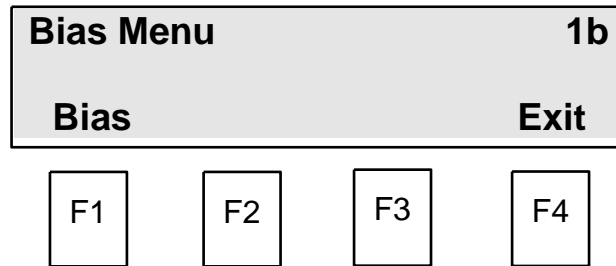Used to switch the printer option on or off.

Baud (F2).

Selects the communication speed (300 or 4800) between the instrument and serial printer. The factory default setting is 300 baud.

Output (F3).

With the printer switched on, this feature allows a unique batch number to be printed each time a measurement is taken. Once set, the number increments by 1 for each subsequent test.

5.0   Mode 1b, Display Description.

```
┌─────────────────────────────────────┐
│  Bias Menu                      1b   │
│                                      │
│    Bias                       Exit   │
└─────────────────────────────────────┘
   ┌────┐   ┌────┐   ┌────┐   ┌────┐
   │ F1 │   │ F2 │   │ F3 │   │ F4 │
   └────┘   └────┘   └────┘   └────┘
```

Mode 1b screen.

Bias Menu.

Denotes Bias mode has been selected.

1b

Shows the number of the selected Mode. Press the MODE key to step through the modes.

Bias (F1).

Used to alter the displayed moisture reading for a specific crop calibration.

Exit. (F4).

Used to exist and save the entered data.

# Using your GrainPro Moisture Analyser.

6.0   System Power Up.

Your first power up.
Press the **"I"** key. The GrainPro powers up in mode 0 showing "**0 Reference"** in the display. Use the "**Up**" (**F2**) key to step through the crop calibrations.

Ongoing power up's
The GrainPro remembers the last selected crop calibration. On power up, the GrainPro returns to the previously selected calibration.
Always check the correct crop is selected before carrying out a test.

```
0 Reference                    0

Down      Up            Run
```
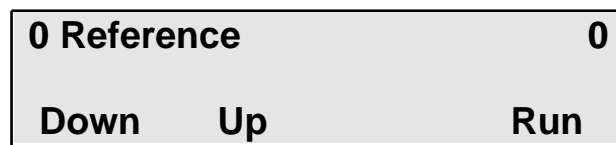
Mode 0 screen.

Warning – Do not rotate the measuring cell anti-clockwise while putting on or removing from the machine.

7.0   Selecting a Crop Calibration (Mode 0, F1 & F2).

Using the **Down** (**F1**) or **Up** (**F2**) key, step through the crop calibrations until the required calibration is displayed. One key press indexes one crop position.

```
1 Wheat                        0

Down      Up            Run
```
```
F1        F2
```
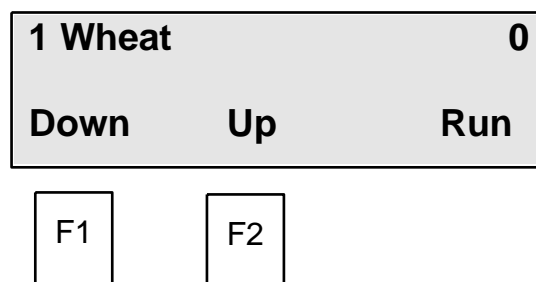
Mode 0 screen.

The display shows the Wheat calibration has been selected, and its curve number is 1.

8.0 Loading the sample.

The GrainPro is supplied with –

- 1off Loading Hopper
- 1off Beaker
- 1off Strike off blade

We strongly recommend the use of all of the above items to achieve the maximum accuracy from your machine.

Method:
Over fill the beaker with sample.

Strike off flush using the stainless steel wiper provided.

Place the *closed* loading hopper on the 3 support posts around the measuring bowl. Pour the sample from the beaker into the loading hopper.
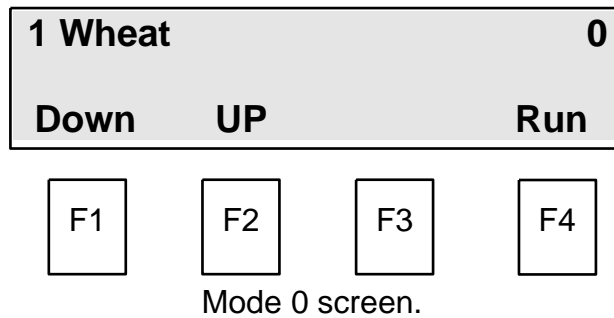

Steady the hopper with one hand and give an upwards tap to the slider with the other. The slider will snap open dropping the sample into the measuring bowl.
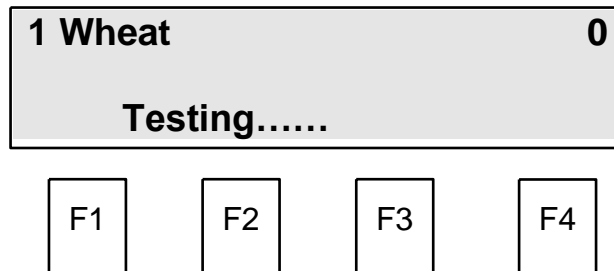
Remove the hopper from the machine.
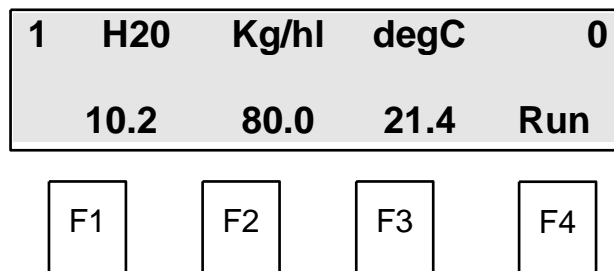
9.0   Taking a measurement. (Mode 0, F4).

With the sample loaded press and release the **Run** (**F4**) key.

1 Wheat			0
Down	**UP**		**Run**

F1	F2	F3	F4

Mode 0 screen.

The display will change showing the selected crop on the top line and **Testing….** on the bottom.

1 Wheat			0
	Testing……		

F1	F2	F3	F4

After approx 3 seconds the results are displayed.

1	H20	Kg/hl	degC	0
	10.2	80.0	21.4	Run

F1	F2	F3	F4

To continue testing with the same crop remove the measuring bowl, empty and
   replace.
Refill the measuring bowl with sample, see Section 8.
Press and release the **Run** (**F4**) key.

10.0 Mode 1. Printer Menu.

This mode is used to set up a printer.

```
Printer Menu                    1

OnOff    Baud    Output
```

| F1 | F2 | F3 | F4 |

By pressing **OnOff (F1)** the display changes to:

```
Printer Switched         On

On      Off              Exit
```

| F1 | F2 | F3 | F4 |

By selecting either **On (F1)** or **Off (F2)** the printer output can be turned on or off. Once selected press **Exit (F4)** to save and exit the screen.

By pressing **Baud (F2)** from the printer menu the display changes to:

```
Baud Rate =              300

300     4800             Exit
```

| F1 | F2 | F3 | F4 |

By selecting either **300 (F1)** or **4800 (F2)** the printer output speed can be selected. Once selected press **Exit (F4)** to save and exit the screen.

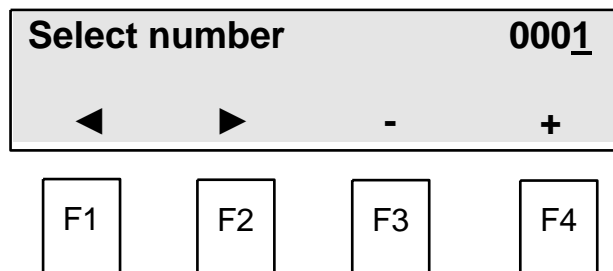By pressing **Output (F3)** from the printer menu the display changes to:

```
Printer Output


         Batch
```

| F1 | F2 | F3 | F4 |
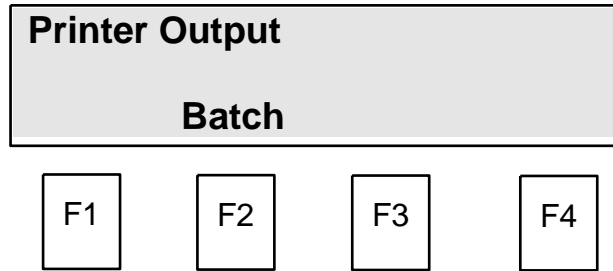
By pressing **Batch (F2)** from the Printer Output menu the display changes to:

```
Select number          0001

    ◄         ►          -          +
```

| F1 | F2 | F3 | F4 |

F1 and **F2** move the flashing curser to the left or right. **– (F3)** and **+(F4)** index the number above the flashing curser up or down.
When the correct number is displayed press the **ENTER** key to save and exit the screen.

11.0 Mode 1b, Bias menu.

The bias function is used if the moisture reading needs to be adjusted in line with the reference method or another piece of equipment. The bias should only be used if the readings are too high or too low by a constant amount over a varying moisture range.
The bias menu enables you to independently enter a bias or offset to each selected crop calibration.

```
Bias Menu                    1b


  Bias                      Exit
```

| F1 | F2 | F3 | F4 |
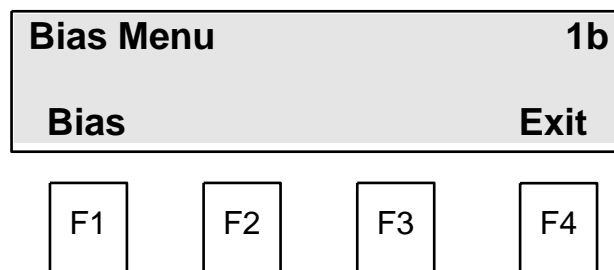
By pressing **Bias (F1)** the display changes to:-

```
┌─────────────────────────────────────┐
│ 1 Wheat                       0.0%   │
│                                      │
│ Down        UP                Exit   │
└─────────────────────────────────────┘
```

```
┌─────┐  ┌─────┐  ┌─────┐  ┌─────┐
│ F1  │  │ F2  │  │ F3  │  │ F4  │
└─────┘  └─────┘  └─────┘  └─────┘
```
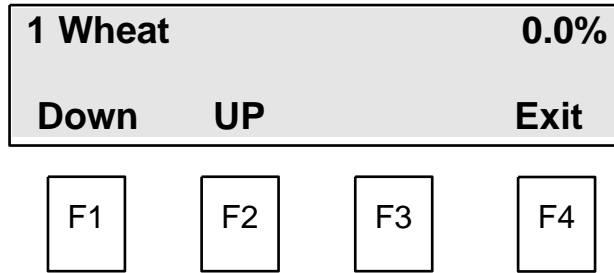
The display shows that calibration number 1, Wheat has been selected for adjustment. This calibration selection is made in Mode 0. See Section 7, Selecting a calibration.
All bias values will be factory set to zero on shipment.

By pressing the **F1** or **F2** keys the required +ve or –ve bias value can be displayed. A positive value will increase the displayed moisture value, a negative value to reduce it. Each press of the key increases or decreases the value by 0.1%.

When the correct bias value is displayed, press the **Exit (F4)** key to save and return to Mode 1b.

Your bias value for the selected crop has now been stored.

12.0 Protected Modes.

When in Mode 1b, by pressing the MODE key again the display changes to.

```
┌─────────────────────────────────────┐
│ Password Required for                │
│ Higher Modes                         │
│                                      │
│                                      │
└─────────────────────────────────────┘
```

Followed by:

```
┌─────────────────────────────────────┐
│ Enter Password                 000   │
│                                      │
│    ◄         ►        -         +    │
└─────────────────────────────────────┘
```

The modes beyond this point are protected by a password.
Please speak with your supervisor to gain access.

If the wrong password is entered the display changes to:

Sorry, wrong !

and then returns to the Mode 0 screen.

0 Reference   **0**

Down   **Up**   **Run**

| F1 | F2 | F3 | F4 |

APPENDIX 1

REPLACEMENT OF BATTERIES

Battery Low indicator

Should the batteries begin to fail, a warning signal will appear when the instrument is switched on.

<div align="center">

* * * W A R N I N G ! * * *
B a t t e r y   L o w ! ! !

</div>

To replace the batteries:

-       remove the sample cell from the instrument.
-       unscrew the battery cover from the underside of the instrument.
-       remove the old batteries and replace with four standard 1.5V
  alkaline batteries (Size C, MN 1400 or equivalent).

BE SURE TO INSERT BATTERIES THE CORRECT WAY ROUND - AS MARKED IN BATTERY BOX - replace the battery cover and screw into position.

Important! Always use alkaline batteries. If you are not going to use the moisture analyzer for some time, remove the batteries from the instrument.

If the optional (factory fitted) 1900-6358 12v Power Kit is fitted the correct DC voltage to operate the FP is provided from a 115v to 240v Power supply.

APPENDIX 2

<u>Technical Specification</u>

Dimensions: 325mm x 164mm x 120mm

Weight: 2.1kg

Construction: HD Polyurethane Foam Injection Moulding

Operating
Environment: 5°C to 40° C ; 41° to 104° F

Storage
Temperature: -20° C to +55° C ; -4° F to 131° F

Humidity: Up to 95% non condensing

Display: Alphanumeric 2 x 20 characters

Power Supply: Four C size 1.5V alkaline batteries or Optional 12v
Power Kit.

Processor: Intel 80C31 Microprocessor

Memory: 32K. EPROM and 32K. RAM

Password: Factory default - 226

Measurement
Range: 1-40% moisture, wet basis (depending on application)

Printer Output: RS232C, 300 or 4800 Baud

Accuracy: Manufactured in accordance with ISO 7700/1, OIML
International tolerances for Class 1 meters

Weight balance: Measures and corrects for weights between 115-240 grams

Temperature
Correction: Thermistor sensor. The correction is software programmable

Cell volume: 290 ml.

APPENDIX 3

ERROR CODE SUMMARY

Error Code	Explanation	Recommended Action
Err.0	Sample weight too low	Use large sample (greater than 115g)
Err.1	Sample cell not correctly mounted	Remount the sample cell firmly on the male interface
Err.2	Capacitance reading is too high (over 100)	Check hardware. If necessary, scale down capacitance by changing byte 28
Err.3	Capacitance reading is too high at low moisture	Check hardware. If necessary, scale down capacitance by changing byte 28
Err.4	High moisture reading at low capacitance reading	Check hardware. If necessary, this can be rectified by shifting the calibration
Err.5	Capacitance reading is too low for the calibration curve (i.e. %MC would be negative)	Check hardware. Check calibration curve
Err.6	Communication error in RS232	Check cable and start again
batt	Battery low indicator	Replace the batteries