GE
Sensing

Surveymaster®

Protimeter Dual-Function Moisture Meter

Instruction Manual

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Table of Contents

Introduction

The *GE Protimeter Surveymaster* moisture measurement system is used for measuring the moisture level of non-conductive and porous construction materials. It has two modes of operation:

- Search
- Measure

When both modes are used together, the modes greatly enhance the user's ability to identify the extent and profile of excess moisture and to diagnose the cause of moisture related problems.

The Surveymaster incorporates a digital display that is synchronized with a color coded LED scale. Whereas the digital display shows the actual (when measuring wood in the Measure mode) or relative moisture level of the material under investigation, the LED scale indicates the material's moisture condition. **Green** zone readings represent a safe, air-dry state, **yellow** zone readings represent a borderline state, and **red** zone readings represent a damp condition.

1 Product Features

The *Protimeter Surveymaster Kit* comprises a carry case containing the Surveymaster instrument and a range of standard accessories. As an example, see Table 1 and Figure 1 on the next page for a typical **BLD5360** kit.

Table 1: Protimeter Surveymaster Kit

Description	Part Number
Standard Kit	BLD5360
Kit Components	
Protimeter Surveymaster Instrument	POL5360
Instruction Manual	INS5360
Carry Case	POU5812
Moisture Probe	BLD5060
Deep Wall Probes (5.5 in./140 mm long)	BLD5018
Calibration Check Device (for %WME)	BLD5086
Wood Calibration Table	INS0003

Figure 1: BLD5360 Kit

2 Switching the Protimeter Surveymaster ON and OFF

Prior to initial use, make sure that a 9.0 volt battery is correctly installed in the battery compartment.

Note: *Low battery power is indicated by* BAT *on the display; if this occurs, replace the battery.*

3 Search Mode Operation

The Search mode utilizes a radio frequency transceiver located in the bulge on the underside of the Surveymaster. It gives relative readings up to a nominal depth of 3/4 in. (19 mm) into the material against which it is held. The actual depth of measurement is subject to the characteristics of the material under test.

1. Press ⏻ to switch the Surveymaster **ON**, but leave the needle cap in position.
2. Check the operational mode of the instrument by looking at the digital display. **REL)))** indicates the Surveymaster is in Search mode, whereas **%WME** indicates the Surveymaster is in Measure mode.
3. If the instrument is in Measure mode, press ▶ to switch to Search mode. **REL)))** will appear on the display.
4. Hold the Protimeter Surveymaster instrument as shown in the photograph at the right. Ensure that your forefinger and thumb do not extend beyond the top of the black plastic grip band and wrap all of your fingers around the side of the instrument.

5. Place the instrument against the surface of the wall, floor or element at the point of measurement, as shown at the right.

Note: *Note that the Surveymaster should be held at a nominal 25° angle to the surface so that both the instrument needle cap and the sensor bulge are in contact with the surface.*

6. Read the relative moisture level value from the display and note the moisture condition of the material from the color coded LED scale.

4 Search Mode Interpretation

When used in Search mode the Surveymaster is a moisture detector. Search mode readings give, in relative terms, the moisture condition beneath the surface of materials. This mode of operation is ideal for making rapid surveys of solid walls and floors and to pinpoint areas of concern that may justify a more extensive investigation.

The Search mode may also be used as an alternative to Measure mode when it is impractical or undesirable to push electrode pins into surfaces. For example, consider taking moisture readings behind ceramic tiles in shower cubicles or in walls covered by quality wallpapers where pinholes would not be acceptable.

Note: *Surface moisture (such as condensation on an otherwise dry wall) has little effect on Search mode readings. Conductors (other than water) within the material may cause high Search mode readings.*

5 Zeroing Feature

The zeroing feature enables the user to compensate for the effects of changes in temperature on the calibration. It is necessary to zero the Search Mode if either of the following appear on the display when the instrument is held away from surfaces:

- numbers (**0**, **1**, **2**, etc.)
- three lines "**---**" and the flashing symbols "**°C °F REL)))**"

If necessary, zero the instrument (with respect to the environment in which it is about to be used) by pressing and holding ▶ for 3 seconds, until the word **"nuL"** appears on the display. Release ▶ and **"nuL"** will flash for a few seconds and then disappear from the screen. The Search mode is now zeroed.

6 Measure Mode Operation

In Measure mode the Surveymaster uses electrical conductance principles to measure the moisture level of the material between two electrodes. The instrument has integral pin electrodes that may be pushed into surfaces, or it may be used with various auxiliary moisture probes including Deep Wall Probes (supplied) or a Hammer Electrode (optional).

1. Remove the needle cap from the top of the Surveymaster and press ⏻ to switch the instrument **ON**.
2. Check the operational mode of the instrument by looking at the digital display. **%WME** indicates the Surveymaster is in Measure mode, whereas **REL)))** indicates the Surveymaster is in Search mode.

3. If the instrument is in Search mode, press ▶ to switch to Measure mode. **%WME** will appear on the display.

4. Push the electrode pins firmly into the surface of the material at the required point of measurement (see the photograph at the right).

5. Read the moisture level value on the display and note the moisture condition of the material from the color coded LED scale.

Note: *Measurements taken in wood are actual % moisture content values, whereas readings taken in material other than wood are % Wood Moisture Equivalent (%WME) values (see* Section 8 *on the next page for more details).*

7 Using Auxiliary Moisture Probes in Measure Mode

The Protimeter Surveymaster is supplied with a *Moisture Probe* and a lead for taking measurements at points that cannot be reached easily with the integral electrode pins.

To use the Moisture Probe, complete the following steps:

1. Plug the Moisture Probe into the socket on the right side of the instrument and push the Probe pins into the surface at the chosen point of measurement (see the photograph at the right).

Note: *A pair of* Deep Wall Probes *is also supplied for taking readings deep in walls and floors.*

2. To use the Deep Wall Probe, drill two clearance holes 1/4 in. (6 mm) in diameter and approximately 1 1/2 in. (40 mm) apart to the required depth.

3. Connect the Deep Wall Probes to the instrument and push the two probe rods into the clearance holes. Hold the rods firmly against the base of the holes while taking the reading (see photograph at right).

Note: *Deep Wall Probes may be used to investigate high readings that were obtained in Search mode and to determine the moisture profile through a structure by increasing the depth of the clearance holes incrementally.*

8 Measure Mode Interpretation

Measure mode readings are precise and specific to the area of contact between the electrode tips. Actual percent moisture content (**%MC**) values are measured in wood products, whereas Wood Moisture Equivalent (**WME**) values are measured in materials other than wood.

The **WME** measurement is the theoretical (**%MC**) value that would be attained by a piece of wood in moisture equilibrium with the material under investigation at the point of measurement. As the critical **%MC** levels of wood are known, **WME** values may be used directly to establish if the material is in a dry, borderline, or damp condition as indicated by the color coded LED scale.

9 Instrument Calibration Check

A calibration check device (*Calcheck*) is supplied with the Surveymaster for checking the Measure mode calibration.

Perform the calibration check as follows:

1. Hold the *Calcheck* across the electrode pins as shown at the right. A correctly calibrated Surveymaster will read **18.2±1.0**.
2. If the instrument reading is incorrect, contact your supplier for further instructions.
3. Check the Search mode operation by holding the instrument against a reference wall that is assumed to be in a stable condition and that does not have any pipes or wires running through it.
4. Note and record the relative value that is displayed.
5. Check the instrument at the same position on the reference wall at regular intervals.
6. Contact your supplier if the reading varies by more than **±50** from the original reference value.

10 User Set-Up Options

The Protimeter Surveymaster is initially set-up to switch **OFF** automatically after 1 minute and to emit an audible beep for readings beyond the yellow zone. The user may change these default settings by entering the Set-up mode.

Setup the *User Options* as follows:

1. With the instrument switched **OFF**, press and hold the ▶ button and switch the instrument **ON** using the ⏻ button. The display will show the firmware version number (e.g. **"4.02"**) until both buttons are released.
2. Scroll across the display and record the following information:
   a. part number (**"bLd5360"**)
   b. firmware date in the form yy-mm-dd (e.g. **"03-03-24"**)
   c. calibration code (e.g. **E1-1**)

Note: *After the scrolling is complete, the display shows* **"0 = 0"** *meaning that option 0 is set to 0. The* ⏻ *and* ▶ *buttons may now be used to change the instrument options and settings, respectively, as detailed in Table 2 on the next page.*

Table 2: User Set-Up Options

⏻ when option # is:	▶ when setting # is:	Surveymaster Set-Up is:
0	0	Instrument settings are not changed from previous settings.
	1	Instrument default settings loaded - switches **OFF** automatically after 1 minute, beeper is activated.
1	0	Beeper is switched **OFF**
	1	Beeper beeps when switching from one operational mode to the other.
	2	Beeper beeps with increasing frequency from nominal 170 value in Search mode and 17% WME in Measure mode.
2	0	Auto switch **OFF** is not active. Instrument can only be switched **OFF** by pressing ⏻ and holding it for 3 seconds.
	1	Auto switch **OFF** is active. Instrument switches **OFF** after 1 minute.
	2	Auto switch **OFF** is active. Instrument switches **OFF** after 2 minutes.
	3	Auto switch **OFF** is active. Instrument switches **OFF** after 3 minutes.

Note: *The instrument options can only be changed in numerical order (i.e. 0, 1, and 2 respectively). Save setting changes and exit the Set-up mode by pressing* ⏻ *again, as in* Step 4 *of the following example:*

Example:

To switch the audible beeper **OFF** and set the auto switch **OFF** time to 3 minutes, complete the following steps.

1. Press and hold ▶ followed by ⏻ to enter Set-up mode.
2. When the display shows **0 = 0**, press ⏻ once to select *beeper options* (1), then press ▶ until the display shows **1 = 0**.
3. Press ⏻ once again to select *auto switch OFF* options (2), then press ▶ until the display shows **2 = 3**.
4. Press ⏻ again to save the settings, exit Set-up mode and return to operational modes.

11 Error Messages

Contact your supplier if any of the following error messages appears on the instrument display:

- **Exx**
- flashing **%H2O**
- flashing **EREL)))**

12 Care and Maintenance

When the Protimeter Surveymaster is not being used, do the following:

- Store the Surveymaster in its carry case (provided with the kit) in a stable and dry environment.
- If the Surveymaster will not be used for an extended period of time, remove the battery.
- Replace the battery when the *battery symbol* appears on the display.
- If the integral electrode pins are worn, replace them by unscrewing the domed retaining ferrules.
- Check the condition of the Moisture Probe and Deep Wall Probe leads and connectors on a regular basis. Replace these items if they are worn or damaged.

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INS5360, Rev. A1