elcometer®

# ELCOMETER 7410

## USER GUIDE

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## INTRODUCTION

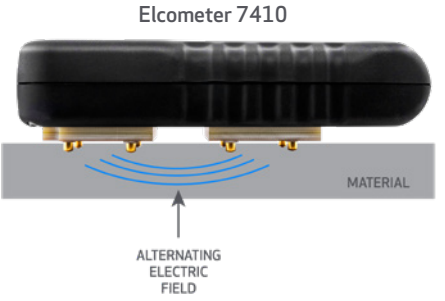
The Elcometer 7410 Concrete Moisture Meter utilises "state of the art" electronic technology to provide the flooring industry with an accurate and simple to use non-invasive handheld instrument for non-destructive testing (NDT) of Moisture Content (MC) in concrete and comparitive moisture readings in gypsum and other floor screeds. It has been designed for the Flooring, Water Damage Restoration, Inspection/Surveying and Indoor Air Quality industries. To get the maximum benefit from the Elcometer 7410 Concrete Moisture Meter, it is suggested that you read this manual to familiarise yourself with the instrument and its capabilities, before undertaking any flooring tests.

**Why should a test be done?**
Concrete floor slabs and screeds that are insufficiently dry before flooring is posed, and high moisture content in existing floor substrates can cause a host of costly flooring system failures. Testing allows for confidence in a job well done that meets manufacturer's recommendations, official standards and customer satisfaction.

**When should a test be done ?**
Concrete floor slabs and screeds should be tested regularly during the drying period, to help evaluate and control the drying process, and ensure that the substrate has reached sufficient dryness before the floor covering is installed. For the purpose of restoration, testing can be done on existing concrete floors and screeds to evaluate the extent and source of water damage, as well as controlling the drying process.

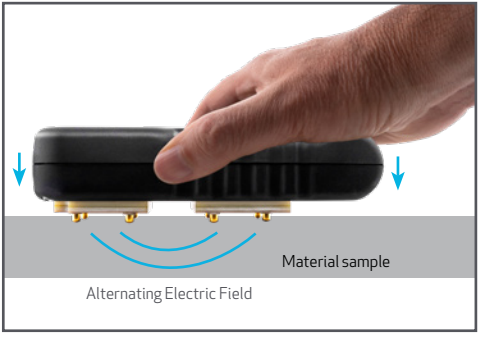
## HOW IT WORKS

The Elcometer 7410 Concrete Moisture Meter detects and evaluates the moisture conditions within the cementitious slab or screed by non-destructively measuring the electrical impedance, which varies in proportion to the moisture content in the material under test. The electrical impedance is measured by creating a low frequency alternating electric field between the electrodes on the base of the meter, to a depth of approximately 3⁄4" (20mm), as illustrated in the diagram below.



This field penetrates the material under test. A very small alternating current flows through the field. The Elcometer 7410 Concrete Moisture Meter detects this current, determines its amplitude and converts it to a moisture content value. By simply pressing the Elcometer 7410 Concrete Moisture Meter down on the surface in strategically chosen locations, instant readings can be taken over a large area in the shortest possible time.

Instrument pressed on to material surface to measure/detect moisture



## INSTRUMENT FEATURES

The instrument face with brief notes on the push button controls and LED indicators is shown below.

1 = Moving coil meter.
2 = Bluetooth® ON LED
3 = Hold flashing LED.
4 = Bluetooth® button
5 = Hold button.
6 = Power ON LED.
7 = Power ON/OFF button.

## INSTRUMENT FEATURES

Your Elcometer 7410 Concrete Moisture Meter employs advanced analog and digital technology to enable the incorporation of the many features listed below.

- Three simple push controls - On/Off; Hold; Bluetooth®; with corresponding LED indicators.
- Concrete moisture readings, 0% to 6%, are displayed on a clear easy to read moving coil meter with linear scale.
- Comparative or qualitative readings for gypsum and other floor screeds are shown on a 0 to 10 scale.
- A reference scale of 0 to 100 .
- To conserve battery life, the instrument automatically powers OFF after 5 minutes of inactivity.
- Power remains on if a change in meter reading is detected or any button is pressed.
- The 3 LED indicators:
- The ON LED illuminates when the ON/OFF button is pressed and remains on until the Elcometer 7410 Concrete Moisture Meter automatically powers off.
- The Hold LED flashes when HOLD is selected.
- If the batteries are nearing end of life, all LEDs flash sequentially for 3 seconds at each power ON to indicate that the batteries should be replaced.

- HOLD button freezes needle on moving coil meter, to facilitate ease of recording readings.
- If HOLD was selected prior to the Elcometer 7410 Concrete Moisture Meter automatically powering off, the frozen meter reading is digitally memorized and restored next time ON/OFF is selected.
- If Bluetooth® was selected prior to the Elcometer 7410 Concrete Moisture Meter automatically powering off it will be restored next time ON/OFF is selected.

## WORKING WITH THE ELCOMETER 7410

**Drying time for concrete floors and screeds**
Concrete floors and screeds must be allowed to dry to an adequate level before the installation of floor coverings or application of coatings. Manufacturers of such systems generally require moisture testing to be performed before installation or use on a floor slab.

Excessive moisture in a floor slab after the installation of a floor covering or coating can cause failures such as condensation, blistering, delaminating, movement and general deterioration of the finished flooring/coating. There is also a risk of promoting microbial growth.

No exact period can be specified for the drying of such floors as this is affected by temperature and humidity within the building as well as concrete curing times and other factors. Typically a period of at least 3 to 4 weeks per 25mm (1inch) depth of concrete or sand/cement screed needs to be allowed. Longer periods may be required in areas of high humidity or low temperature. During the drying period and prior to applying the floor covering, the floor should be regularly checked to monitor moisture content with the Elcometer 7410 Concrete Moisture Meter.

**Pre-test conditioning and preparation**

For best and most accurate results, to allow for an accurate reflection of the amount of moisture present and moisture movement in the slab during normal operating conditions:

- Artificial heating or drying equipment should be turned off at least 96 hours before final readings are taken.
- Internal conditions of the building should have been at normal service temperature and humidity for at least 48 hours.

Prior to testing, the surface should be prepared:

- The test area should be clean and free of any foreign substances.
- All covering materials, adhesive residue, curing compound, sealers, paints, etc., should be removed to expose a test area of clean bare concrete, strictly observing all the appropriate safety and health practices.
- Removal of covering materials and cleaning if required should take place a minimum of 48 hours prior to testing.
- Use of water based cleaning methods that could lead to elevated surface and/or sub-surface moisture levels in the floor slab are not recommended.

## Operating Instructions

1. Power on by pressing ON/OFF button. The power LED will light up and remain on.

> **NOTE**
> If the battery voltage is getting low, the LEDs will flash sequentially for a short period. The instrument will continue to operate for some time but it is recommended that the batteries be replaced as soon as convenient.

2. The Elcometer 7410 Concrete Moisture Meter features Bluetooth® wireless connectivity. If you would like to use an App to record readings and information, please ensure that the Bluetooth® is turned on and the LED indicator illuminated. Your Elcometer 7410 Concrete Moisture Meter identifier will be the serial number that is found on the back of the meter.
3. Press the Elcometer 7410 Concrete Moisture Meter directly onto the surface of the material being tested, having removed any dust or foreign matter from both the Elcometer 7410 Concrete Moisture Meter electrodes and the floor slab. Ensure that all of the electrode spring-loaded pins are fully compressed.

4. Reading the Elcometer 7410 Concrete Moisture Meter analog dial:

- CONCRETE Scale : For concrete, read the moisture content from the top, 0% to 6%, scale of the meter dial. Readings on a concrete floor slab obtained on this scale indicate moisture content measurement and should not be confused with lbs emission or any other unit of measurement obtained by other moisture testing methods or meters. It should also be noted that there is no consistent linear correlation between moisture content measurements and lbs emission or RH measurements as obtained using calcium chloride or relative humidity testing methods.
- GYPSUM Scale: For gypsum and other floor screeds, comparative or qualitative readings should be taken from the middle, 0 to 10, scale of the meter dial.
- 0 - 100 Reference Scale: Alternatively, the lower, 0 to 100, reference scale can be used for comparative readings. This scale is not to be interpreted as a measurement of percentage moisture content, or relative humidity. It is not a relative humidity reading and it does not have any linear correlation with Relative Humidity measurements. This scale should be regarded as a comparative or qualitative scale only.

This scale is included to facilitate comparative testing of different areas where direct contact with the bare concrete surfaces may not be possible due to some form of thin coating or covering on the concrete, or additive in the concrete that could influence the readings. Readings from the reference or relative scale are comparative only and of help in identifying areas with moisture problems.

5. The HOLD function is especially useful when taking readings in areas where it is difficult to see the analog dial while it is being pressed onto the surface.

- Press the HOLD button once for easy and accurate readings. The needle freezes on the analog dial. The HOLD LED light flashes slowly indicating HOLD is on.
- If the Elcometer 7410 Concrete Moisture Meter is powered off while on HOLD, the frozen reading is digitally memorized and restored when powered on again.
- Press the Hold button again to remove the frozen reading in order to take further readings.

6. Recommendations.

- Take a number of tests (3-4) in close proximity to each other, as the distribution of moisture tends to become erratic as concrete dries out. Use only the highest reading.
- Avoid testing in locations subject to direct sunlight or sources of heat.

- Include tests in potentially damp areas such as the center of the slab and within 3 feet (1 meter) of the walls.
- Always refer to the adhesive and/or floor covering manufacturer's recommendations for the acceptable moisture content levels of concrete or floor screeds.

**NOTE**
The Elcometer 7410 Concrete Moisture Meter is calibrated to give percentage moisture content readings on a clean, bare dust free concrete floor slab, therefore readings taken on concrete slabs through paint, coating, adhesives or other materials on the surface of the slab should be regarded as qualitative or comparative and not quantitative.

7. Power down by pressing ON/OFF. The power LED light will go off.

**NOTE**
To conserve battery life, the Elcometer 7410 Concrete Moisture Meter automatically powers OFF after 5 minutes of inactivity.

## LIMITATIONS

The Elcometer 7410 Concrete Moisture Meter will not detect or measure moisture through any electrically conductive materials including metal sheeting or cladding, many types of black EPDM rubber or wet surfaces. The Elcometer 7410 Concrete Moisture Meter is not suited for taking comparative readings in the concrete substrate through thick floor coverings such as wood. Moisture readings taken with the Elcometer 7410 Concrete Moisture Meter indicate the conditions at the time of testing.

## CALIBRATION

For regular on-site assessment of your Elcometer 7410 Concrete Moisture Meter in moisture measurement mode, a calibration-check plate is available from the suppliers of your Elcometer 7410 Concrete Moisture Meter. Should it be found that readings are outside the set tolerances, it is recommended that the Elcometer 7410 Concrete Moisture Meter be returned for re-calibration. Calibration adjustments should not be carried out by anyone other than Tramex or their authorized service provider who will issue a calibration certificate on completion. Requirements for quality management and validation procedures, such as ISO 9001, have increased the need for regulation and verification of measuring and test instruments.

It is therefore recommended that calibration of the Elcometer 7410 Concrete Moisture Meter should be checked and certified in accordance with the standards and/or protocols laid down by your industry (usually on an annual basis) by an authorized test provider. The name of your nearest test provider and estimate of cost is available on request.

## WARRANTY

For Warranty details, please go to:
https://www.elcometer.com/en/warranty-statement

## SAFETY

This Users Guide does not purport to address the safety concerns, if any, associated with this instrument or its use. It is the responsibility of the user of this instrument to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

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