

This Quick Instructions document assumes that the operator is familiar with the applications of the 3401 and 3411 nuclear moisture density gauges. These following instructions are intended to aid the user in the operations of the gauge functions. For detail description of the applications of the gauge, please refer to the gauge manufacturers manual of operations.

ON
YES

Use this key to turn the gauge to On position. When gauge is on, use this key to answer 'YES' to questions asked during the operations of the gauge.


OFF
NO

Use this key to turn the gauge to Off position. When gauge is on, use this key to answer 'NO' to questions asked during the operations of the gauge.


STD

Use this key to take a Daily Reference Standard Count. Place your gauge on top of the polyethylene reference block on top of a solid surface (soil, asphalt or concrete) press the key and follow gauge prompts. A new standard count is accumulated and is stored in the gauge until another reference standard count is collected. Turning the gauge off does not erase the most recent standard count.

TIME

Use this key to adjust the measurement count time. The time of measurement options are 15 seconds, 1 minute and 4 minutes. Press the "TIME" key and follow the screen prompts to adjust the time. Press  to return to <READY> screen.

DEPTH

Use this key to adjust the depth of measurement from 0 to 12 inches (0 to 300 mm). Press the "DEPTH" key and follow the screen prompts to set the desired depth of measurement. Press  to return to <READY> screen.

MA
FR

Use this key to enter your laboratory measured density values such as Marshall, Proctor or Maximum density in the gauge. Press the UP/DOWN key to change the number and ENTER to select. Press ENTER after completing the entry to accept the input value. The gauge uses this value to calculate %PR for soil and aggregate or % MA for asphalt. % MA is defined as the calculated percentage of gauge density value relative to the value of maximum density entered by the operator. It can also be used for determination of % compaction. The most recent entry is stored in the gauge until it is changed.

MENU

The following functions are available under the MENU key. Press Down to go the next menu item or Enter to Select

- 1- RECALL, this function recalls the last data point collected by the gauge. Select RECALL and press the UP and DOWN keys to view your last collected data point.
- 2- OFFSET, under this function you have the choice of Density, Moisture and Trench Offset. Go to OFFSET function, Press Enter, Select the appropriate offset function and enter the required information. Density Offset allows the user to add or subtract a known amount from the wet density value. Moisture Offset corrects the gauge

reading to oven dry or other field moisture determination methods. Trench Offset corrects the moisture readings for effects from trench walls. See below for more information on offset functions.

- 3- STAT TEST, this function accumulates 20 consecutive one minute counts on top of the reference standard block. Place the gauge in safe position on top of the reference standard block and press START. The gauge will run for 20 minutes and calculate the appropriate statistics to test the stability/repeatability of the gauge. Passing statistics in this mode will indicate electronic stability of the gauge. Two out of three failing consecutive STAT results will indicate potential problems with the gauge and might require that the gauge be serviced.
- 4- DRIFT TEST, this function accumulates 5 four minute counts on top of the reference standard block. Make sure a STAT test has been done prior to performing a DRIFT test. The average results from the STAT test is compared to the results from the DRIFT test to determine if there is a drift in the electronic function or mechanical inconsistency in the source/detector geometry between the time when STAT and DRIFT counts were accumulated. To perform a DRIFT test, place the gauge in the safe position on top of the reference standard block (same as STAT test) and press START. The gauge will automatically compare the results to the STAT test results and display a pass fail limit. If the Drift test fails twice, contact your service center.
- 5- AUTO SCROLL, in this mode the results are displayed in sequence without the operator having to push any buttons. Each screen stays active for 5 seconds. This allows the operator to concentrate on writing the results and not having to worry about changing screens to collect all the data.
- 6- SET UNITS, change the units from English to Metric. Select SET UNITS and follow screen prompts.
- 7- LCD LIGHT, this is a backlight function that can be used during night operations. The backlight stays on for 20 seconds. If no keys are pressed within 20 seconds, the LCD backlight is turned off. While this feature is on, pressing any key, except OFF will turn the backlight back on for another 20 seconds.
- 8- CALIB. CONST., allows access to read or change the calibration constants in the gauge. A code is required to activate this function.
- 9- SERIAL NUM., allows access to read or modify the gauge serial number. A code is required for this function.

Serial Port Feature- At power up, if a serial cable is connected to the gauges' serial port and the serial program on the PC is active, the operator is prompted via the PC terminal to select a menu item. The gauge LCD will indicate "Serial Port Activated". The operator will have the option of selecting, accessing, modifying and loading all the calibration constants and the density up or down according to the sign on the offset value.

Offset Functions-

- 1- Density Offset, provides the operator a means of adjusting the wet density readings of the gauge. The offset value can be positive or negative. The gauge corrects the wet density up or down according to the sign on the offset value.
- 2- Moisture Offset, provides a means for correction of gauge moisture to oven dry, speedy dry or fast dry methods. Follow gauge manufacturers recommendations to collect gauge readings and corresponding oven, Speedy or fast dry % moisture. Use the following equation to calculate the K value

$$K = \left(\frac{\%M(\text{True}) - \%M(\text{Gauge})}{\%M(\text{Gauge}) + 100} \right) \times 1000$$

%M (Gauge) is gauge derived % moisture values with K=0 (no moisture offset)
%M (True) is %moisture determined by oven dry, Speedy dry or fast dry methods

Enter the K value into the gauge and all subsequent readings taken on the job site will be corrected accordingly.

- 3- Trench Offset, provides a means for influence of trench walls on gauge moisture counts. Take a reference standard count outside the trench, record the moisture standard counts, MS. Place the gauge inside the trench on top of the reference lock in safe position, change the time setting to 4 minutes, and press START to accumulate a count. Record the moisture count, M Count.

$$\text{Trench off} = M \text{ Count} - MS$$

Note, if M Count is lower than MS, do not use the trench offset or repeat the counts
If M Count is lower than MS, then it does not appear that the walls are influencing the moisture readings.

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FAST, ACCURATE, INNOVATIVE