LaMotte

NEW!
Direct Reading
TDS and Salt!

EC/TDS/SAL
TRACER™
POCKETESTER™

CE

CODE 1749

Conductivity/TDS/Salinity/Temperature/Meter

TRACER

EC/TDS/SAL POCKETESTER™ • CODE 1749

TABLE OF CONTENTS

WARNING! This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision

INTRODUCTION

Congratulations on your purchase of the EC/TDS/SAL (Electro Conductivity/Total Dissolved Solids/Salinity) TRACER PockeTester. The TRACER is a revolutionary, first of its kind measurement device that offers direct reading of conductivity, TDS and salinity with one electrode. Careful use and maintenance will provide years of reliable service.

SPECIFICATIONS

Display	2000 count LCD with Bar Graph
Conductivity Range	0 to 199.9 µS 200 to 1999 µS 2.00 to 19.99 mS
TDS Range	0 to 9,990 ppm (variable ratio)
Salinity Range	0 to 9,990 ppm Salt (fixed ratio of 0.5)
TDS Ratio	0.4 to 1.0, adjustable
Salinity Ratio	0.5 fixed
Conductivity ATC	2.0% per °C
Temperature Range	32.0 to 149.0 °F, 0.0 to 65.0 °C
Temperature Resolution	0.1 up to 99.9, 1>100
Temperature Accuracy	±1.8°F, 1°C (from 32 to 122°F, 0 to 50°C) ± 5.4°F, 3°C (from 122 to 194°F, 50 to 90°C)
Conductivity ATC Range	32.0°F to 140°F, (0.0°C to 60.0°C)
Accuracy	Conductivity: ± 2% FS TDS: ± 2% FS Salinity: ± 2% FS
Measurement Storage	25 numbered readings
Low Battery Indication	'*BAT*' appears on the display
Power	Four CR 2032 Lithium Ion batteries
Auto Power Off	After 10 minutes of no button presses

Operating Conditions	23 to 122° F, –5 to 50° C
Dimensions	1.6 X 7.4 X 1.6 inches, 40 X 187 X 40 mm
Weight	3.1 oz, 87 g

CONTENTS

EC/TDS/SAL TRACER PockeTester Kit	Code 1749
Includes:	
Conductivity Standard, 12,880 µS	Code 6317-G
Sample Cup w/cap †	

† Not sold individually. See below.

PARTS & ACCESSORIES

EC/TDS/SAL Replacement Electrode	Code 1765
Weighted Stand w/Sample Cups (5)	Code 1746
Sample Cups w/caps (24)	Code 1745
Conductivity Standard, 84 µS	Code 6312-G
Conductivity Standard, 1413 µS	Code 6354-G
Conductivity Standard, 12,880 µS	Code 6317-G

METER DESCRIPTION

Front Panel Description

1. Battery compartment cap
2. LCD Display
3. MODE/HOLD button - change mode, hold data, store data
4. CAL/RECALL button - calibration, change temperature units, recall data
5. ON/OFF button
6. Electrode Collar
7. Electrode

(*Note: The Electrode cap is not shown*)

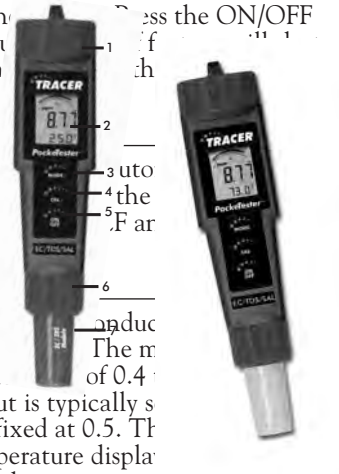
TRACER Display

1. Bar graph reading
2. Measurement reading
3. BAT (low battery) indicator
4. Temperature display
5. Measurement units
6. Calibration range indicators
7. HOLD indicator

BASIC OPERATION

Powering the TRACER

The Tracer uses four CR2032 Lithium Ion batteries. If the batteries are weak, the BAT indicator will appear on th ess the ON/OFF key to turn the TRACER on or off. The au f the TRACER off automatically after 10 m ch push.



Automatic Calibration

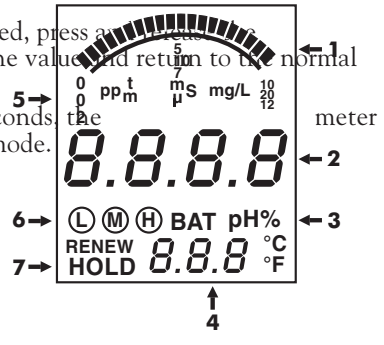
When the TRACER is turned on, it will uto Calibration mode. SELF and CAL will a the progress. After the calibration is comple F ar icons will extinguish.

TDS Conversion Ratio

The TDS value is determined by multi nduc measurement by a known conversion The m selection of a conversion ratio factor i of 0.4 selected ratio will vary with application but is typically s and 0.7. In the salinity mode, the ratio is fixed at 0.5. Th factor will briefly appear in the lower temperature displa meter is first turned on or when changing the measurement function to TDS.

To Change the TDS Conversion Ratio:

1. Turn the TRACER on.
2. Press and release the CAL/RECALL button twice. The stored ratio will appear in the display.
3. Press the MODE/HOLD button to change the ratio value in steps of 0.1.
4. When the desired ratio is displayed, press a CAL/RECALL button to store the value and return to the normal mode.
5. If no buttons are pressed for 5 seconds, the meter will return to the measurement mode.



Changing the Displayed Temperature Units

To change the displayed temperature units between °F or °C:

1. With the TRACER off, press and hold the CAL/RECALL button.
2. With the CAL/RECALL button pressed, momentarily press the ON/OFF button. When SELF CAL appears in the display, release the CAL/RECALL button. The TRACER will return to the operational mode with the temperature displayed in the new units.

Data Hold

Press the MODE/HOLD button to freeze the current reading. The HOLD icon will appear, the reading will be stored. Press the MODE/HOLD key to return to normal operation.

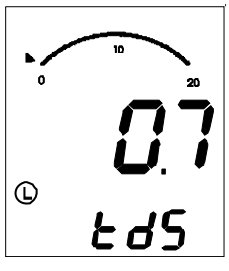
Auto Power Off

The auto-power off feature will automatically shut the meter off 10 minutes after the last button was pressed. To disable the auto-off feature:

1. Press the ON/OFF button to turn the meter on.
2. Wait for the SELF display screen to appear. This is the second screen to appear after turning on the meter. IMPORTANT: Review the instructions for the next 3 steps before proceeding. Step 3 must be followed immediately by Step 4.
3. Press CAL/RECALL button once.
4. Press MODE/HOLD and ON/OFF buttons simultaneously. Quickly release buttons.
5. oFF will be displayed on the screen. Watch carefully. It will disappear quickly.
6. The auto power off feature will be restored automatically when the meter is turned off. Auto-off is the default function when the meter is turned on.

Low Battery Indicator

The “BAT” indicator will be displayed when the batteries become weak. Refer to the maintenance section for battery replacement information



TESTING

Getting Started

1. Remove the cap from the bottom of the TRACER to expose the electrode.
2. Before the first use, rinse the electrode in deionized water and dry.
3. For best results, calibrate for conductivity with a standard in the expected range of the sample. For maximum accuracy calibrate from low conductivity value standards to high conductivity value standards.

Changing the Measurement Function

The meter can be set to measure Conductivity, TDS (ppm), TDS (mg/L) or Salinity. To change the mode:

1. Turn the TRACER on.
2. Press and hold the MODE/HOLD button for 2 seconds. The display will begin to scroll through the units.

   µS or mS (Conductivity)
   ppm (TDS)
   ppm (Salinity “S”)

3. Release the MODE/HOLD key when the desired mode is displayed.
4. Note that the "HOLD" function can not be on when changing functions.

Measurement

1. Fill a sample cup to the 20 mL line with the test sample. Sample depth must be greater than or equal to 1.5 inches.
2. Immerse the TRACER electrode in the sample. Make sure the electrode is completely submersed.
3. Press the ON/OFF button. (8888 and then SELF CAL will appear in the display during the initial diagnostics).
4. Press and hold the MODE/HOLD button to scroll to the desired measurement mode.
5. Slowly stir the sample with the TRACER to remove air bubbles.
6. The meter will autorange to the proper range and the reading will be displayed.
7. Rinse the electrode in distilled water. Replace the cap.

Measuring the TDS of Soil

1. Fill a 50 mL beaker with the soil sample. Tap the beaker lightly on a hard surface to remove trapped air. Remove excess soil from the surface.
2. Empty the soil into a 250 mL wide-mouth flask.
3. Add 100 mL of distilled water. Stopper and shake vigorously.
4. Wait 30 minute. (Shake the flask vigorously three or four times during this period.)
5. Filter the contents of the flask. Collect the filtrate in a beaker.
6. Rinse the electrode with distilled or deionized water to remove impurities.
7. Press the ON/OFF button to turn the TRACER on. Make sure the meter is in the TDS mode.
8. Immerse the electrode in the filtrate. Make sure the tip of the electrode is completely immersed.
9. Stir the filtrate with the electrode to create a homogeneous solution.

10. Gently stir the filtrate with the electrode. Read the TDS value of the filtrate from the display.
11. Rinse the electrode in distilled water. Replace the cap.

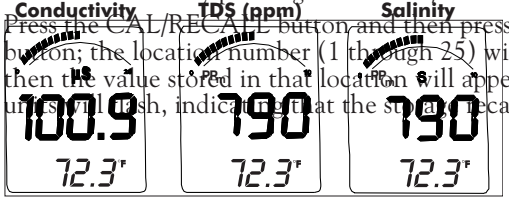
Storing Readings

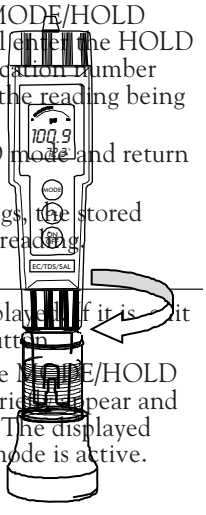
1. After the reading is displayed press and hold the MODE/HOLD button to store the current reading. The meter will enter the HOLD mode and HOLD will be displayed. The storage location number will be displayed on the lower display followed by the reading being stored.
2. Press the MODE/HOLD button to exit the HOLD mode and return to normal operation.
3. If an attempt is made to store more than 25 readings, the stored readings will be overwritten starting with the first reading.

Recalling Stored Readings

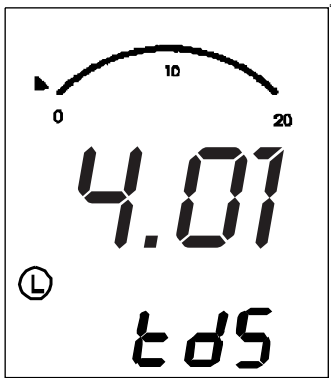
NOTE: First ensure that the HOLD symbol is not displayed. If it is, exit the HOLD function by pressing the MODE/HOLD button.

1. Press the CAL/RECALL button and then press the MODE/HOLD button; the location number (1 through 25) will briefly appear and then the value stored in that location will appear. The displayed units will flash, indicating that the storage recall mode is active.





2. The last stored reading taken will be displayed first. To advance to the previously stored readings, press the MODE/HOLD button. The location number is displayed first, followed by the reading stored in that location.
3. To exit the storage mode, press the CAL/RECALL button and the TRACER will return to normal operation after displaying “End”.



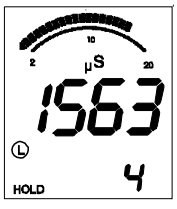
Clearing the Stored Memory

Turn the TRACER on. Press and hold the ON/OFF button for 4 second the display will briefly desplay “clr” when the memory is cleared.

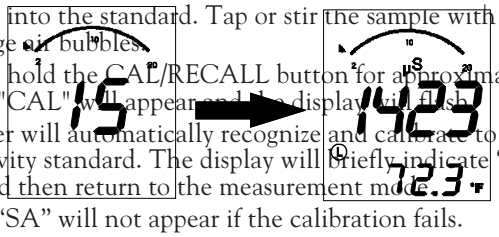
CALIBRATION

For the most accurate results, allow sufficient time for the temperature of the probe to reach the temperature of the sample before calibrating. This will be indicated by a stable temperature reading on the display

Meter accuracy verification should be performed on a periodic basis as needed. **If calibration is required, the meter must be in the conductivity mode to perform all calibration for conductivity, TDS and Salinity.** The meter can perform a calibration and store the data for each of the three ranges – low, medium and high. The automatic calibration recognition procedure will recognize conductivity standards of 84 µS (Low), 1413 µS (Medium) or 12,880 µS (12.88 µS) (High). (See Page 5). Always calibrate in the range closest to the expected measurement value. **For salinity samples within the range of 1,000 to 9,999 ppm salinity, calibrate with a 12,880 µS calibration standard.**



1. Fill a sample cup to 20 mL line with a conductivity standard.
   NOTE: The meter allows for a 1, 2, or 3 point calibration. If calibration is done for more than one point, the lowest concentration should be done first to obtain the best accuracy. Calibrate the ranges from low to high
2. Press the ON/OFF button to turn the TRACER on. Insert the electrode into the standard. Tap or stir the sample with the Tracer to dislodge air bubbles.
3. Press and hold the CAL/RECALL button for approximately 2 seconds. "CAL" will appear and the display will flash.
4. The meter will automatically recognize and calibrate to the conductivity standard. The display will briefly indicate “SA” and “End” and then return to the measurement mode.
   NOTE: “SA” will not appear if the calibration fails.
5. The calibration range indicator will appear on the display for each range that is calibrated during a power on cycle.



NOTE: Each time the calibration mode is entered all calibration range indicators will be cleared, but only the calibration data for the currently selected range will be replaced. The calibrations for the other two ranges will be saved even though the indicators for those ranges are no longer displayed. Calibration of all three ranges must be performed during one power on period for all three calibration range indicators to be displayed.

Ⓛ Low Range, 84 µS/cm

Ⓜ Medium Range, 1413 µS/cm

Ⓗ High Range, 12.88 mS/cm (12,880 µS/cm)

OPERATIONAL MATRIX

Function/Resulting Action	Power	Mode	Key Press Sequence
On/Off	On or Off	Any	Momentary press of ON/OFF button
Calibration	On	Con	Press & hold CAL/RECALL button for 2 seconds until CAL is displayed
Store Reading	On	Any	Momentary press of MODE/HOLD button
Hold Release	On	Hold	Momentary press of MODE/HOLD button
Enter Memory Retrieval	On	Any	Momentary press of CAL/RECALL button followed by a momentary press of MODE/HOLD button within 4 seconds.
Scroll Stored Readings	On	Memory Recall	Momentary press of MODE/HOLD button Displays last in first out.
Exit Memory Retrieval	On	Memory Recall	Momentary press of MODE/RECALL button
Clear Stored Memory	On	Any Measure Mode	Press and hold the ON/OFF button for 4 seconds until “clr” is displayed.
Change Measurement Mode	On	Any	Press and hold MODE/HOLD button for 2 seconds. Modes will scroll by until button is released

Function/Resulting Action	Power	Mode	Key Press Sequence
Enter CON/TDS Ratio	On	TDS (ppm or mg/L)	Press and release the CAL/RECALL button twice in quick succession.
Change CON/TDS Ratio	On	TDS (ppm or mg/L)	Press and release the CAL/RECALL button twice in quick succession. Momentary press of MODE/HOLD button. Each press increases ratio by 0.1 from 0.4 to 1.0.
Exit CON/TDS Ratio	On	TDS (ppm or mg/L)	Momentary press of CAL/RECALL button.
Change Temperature Units	On	n/a	Press and hold CAL/RECALL button then momentarily press ON/OFF button. Release CAL/RECALL button after“Self Cal” is displayed.
Override Auto Power Off	On	Any	Momentarily press CAL/RECALL button then simultaneously press and hold CAL/RECALL and MODE/HOLD buttons for 2 seconds until “oFF” is displayed.
Default Reset	Off	n/a	Simultaneously press ON/OFF, CAL/RECALL and MODE/HOLD buttons momentarily. “dFlt” will be displayed.

MAINTENANCE

Storage

1. Rinse the electrode in distilled or deionized water.
2. Store the electrode dry with the cap on.
3. Always rinse the electrode in deionized water between measurements to avoid cross contamination. Double rinsing is recommended when high accuracy is required.

Battery Replacement

1. Twist off the battery compartment cap.
2. Hold the battery housing in place with one finger. Remove the battery carrier by pulling on the small tabs.
3. Replace the four CR2032 batteries. Observe polarity.
4. Replace the battery compartment cap.

Electrode Care

1. Always rinse the electrode in distilled or deionized water between measurements to avoid cross-contamination of the samples. Double rinsing is recommended when high accuracy is required.
2. Do not touch the electrodes. Touching the surface of the platinized electrodes may damage and reduce the life of the electrodes.

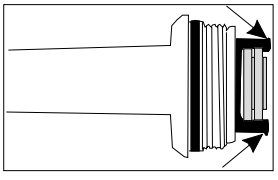
Replacing the electrode

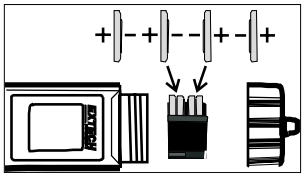
1. Unscrew and remove the electrode collar. Turn collar counter-clockwise.
2. Gently rock the electrode side to side, while pulling it away from the meter, until it disconnects from the electrode socket.
3. To attach an electrode, align the slots and carefully plug the electrode into the meter socket.
4. Firmly tighten the electrode collar to create a seal with the rubber gasket between the electrode and the meter.

Electrode Cleaning Recommendations

Do not soak the electrode in the solutions for longer than the recommended length of time. To do so may cause a reference potential shift which will cause a degradation in performance or failure. When cleaning the probe, do not scratch or damage the platinized electrode surfaces.

Contaminant	Cleaning Solution	Procedure
Water soluble substances	Deionized water	Soak or scrub with a soft brush. Rinse thoroughly with DI water and dry.





Grease and oil	Warm water and household detergant	Soak or scrub with a soft brush, maximun 10 minutes. Rinse thoroughly with DI water and dry.
Heavy grease	Alcohol	Soak for a maximum of 5 minutes. Scrub with a soft brush. Rinse thoroughly with DI water and dry.
Lime and hydroxide coatings and oil	10% Acetic acid	Soak until coating dissolves, maximum 5 minutes. Rinse thoroughly with DI water and dry.

TROUBLESHOOTING

Problem	Check	Action
Reading is frozen	HOLD mode	Press MODE/HOLD button to exit HOLD mode
“BAT” message	Batteries low	Replace batteries
Meter will not calibrate in conductivity mode	Trapped air bubbles	Tap probe or stir sample to release air bubbles
	Dirty probe	Clean conductivity probe
	Damaged probe	Replace probe
	Contaminated conductivity standards	Use fresh standards
Meter will not turn on	Batteries low or dead	Replace batteries
	Battery polarity	Replace batteries with correct polarity
Unit will not respond to any key presses	Internal fault	Perform hard reboot. Remove batteries, hold ON/OFF button down for 5 seconds, replace batteries
"_oL_" message	Sample is out of range	Dilute sample