Trace2o

Hydrolite-EC

HL102-EC User Manual

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INTRODUCTION

The HydroLite® HL102 is a pocket-sized conductivity (EC), TDS and temperature tester. This manual provides instructions on use, with a step-by-step operating guide, as well as care and maintenance instructions.

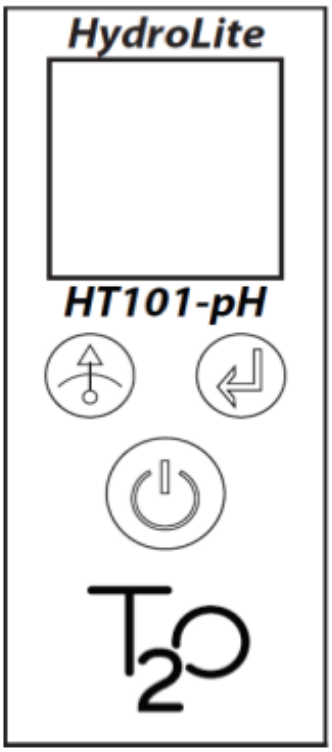
Components:

HydroLite® HL101 pocket EC/TDS/Temperature tester

EC Calibration Solution (1413µS)

Keypad:

The HL102 pocket EC/TDS/Temperature tester uses a simple three-button membrane keypad, with graphical symbols to describe the function of each key.

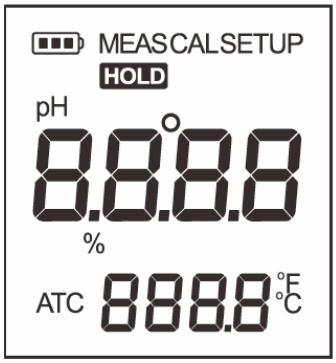


MAP OF KEYS AND FUNCTIONS:

KEY	FUNCTION
On/Off Hold	• Power the unit ON/OFF • Freezes the currently displayed value for recording; press the key again to resume measuring. • When in calibration mode, exits calibration and returns to measurement mode.
Cal	• Press the key to enter the calibration mode. • Press and hold the key to enter the setup menu. • In the setup mode, press the key to select default options.
Enter	• Confirms the calibration or selected option.

DISPLAY

The unit is equipped with a clear LCD display that is used to show measured value, units, mode indicators and function indicators.

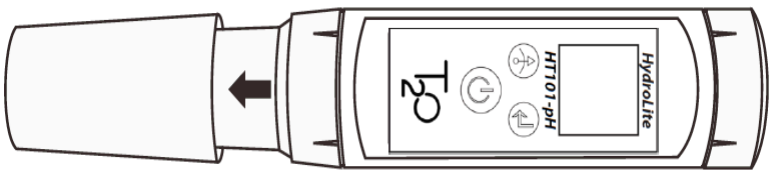


MAP OF MODE INDICATORS AND DESCRIPTIONS

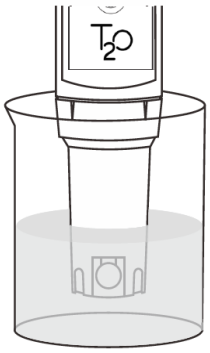
Mode indicator	Description
MEAS	Indicates unit is in the measurement mode
CAL	Indicates unit is in the calibration mode
SETUP	Indicates unit is in SETUP mode
HOLD	Indicates the measured value has been frozen
ATC	Indicates temperature compensation is enabled

PRIOR TO USE:

Remove the electrode protective cap from the unit.



If the membrane on the electrode dries out, soak the electrode in 3M KCL solution or tap water for at least 15 minutes. DO NOT use distilled or deionised water, as this will shorten the life of sensor.



POWER ON/OFF

- Press ON/OFF key to turn on the unit, the display shows measured value.
- Press and hold the ON/OFF key for 5 seconds, the unit will turn off.
- If no key is pressed for 8 minutes, the unit will automatically turn off to conserve power.

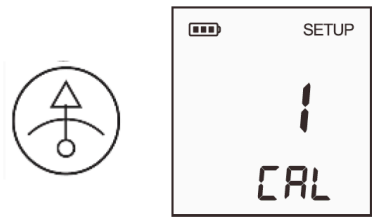
Note: The auto-off function can be disabled if required – see below for further details

Setup Menu:
The HL102 pocket EC/TDS/temperature tester includes a comprehensive setup menu with customisable options to suit user measurement requirements.

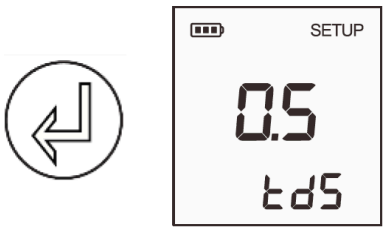
PARAMETER	DESCRIPTION	OPTIONS	DESCRIPTION	DEFAULT
CAL	Calibration Point	1	1 point	•
		2	2 points	
		3	3 points	
tdS	TDS Factor	0.5	Setting Range: 0.1 to 1.0	0.5
UNIt	Temperature Unit	°C	Degrees Celsius	•
		°F	Degrees Fahrenheit	
°C	Temperature Calibration	CAL	Enters the temperature calibration mode	
HOLd	Auto-Hold	YES	Automatically freezes a stable reading	
		NO	Disable	•
OFF	Auto-Off	YES	Automatically turn off the unit	•
		NO	Disable	
rSt	Reset	YES	Restore factory settings	
		NO	Disable	•

SETTING THE DEFAULT PARAMETERS

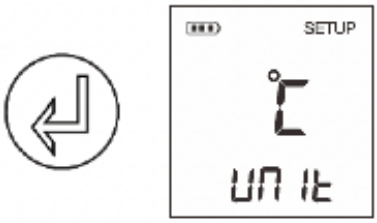
1. Press and hold the CAL key for 3 seconds to enter the setup menu; the unit goes to buffer standard selection mode, the display shows “USA/BUF” (USA standard).



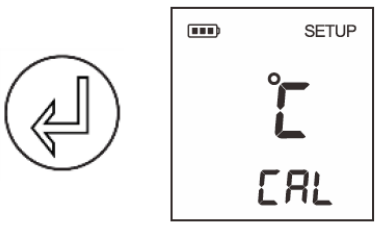
2. Press CAL key to select the USA or NIST standard for pH buffers. Press ENTER key to confirm; the unit goes into calibration point selection mode, the display shows “2/CAL” (2 points calibration).



3. Press CAL key to select the number of calibration points (1, 2 or 3 points). Press ENTER key to confirm; the unit goes into temperature unit selection mode, the display shows “oC/UNIT”.

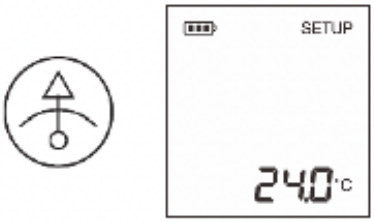


4.Press CAL key to select the temperature units (oC or oF). Press ENTER key to confirm, the unit goes into temperature calibration mode, the display shows “oC/CAL”.

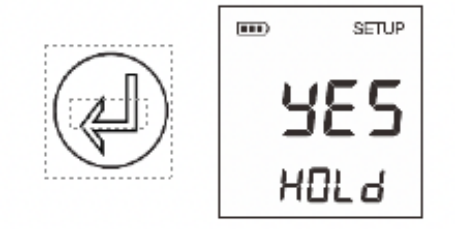


5.If you do not want to perform temperature calibration, press ENTER key; the unit goes to next option.

6.To perform temperature calibration, press CAL key to enter the temperature calibration mode, the display shows current temperature reading.

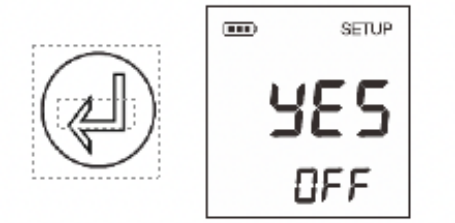


7. Press CAL key to set temperature value. Press ENTER key to confirm; the display shows “YES/HOLD” indicating that the auto-hold function is enabled.



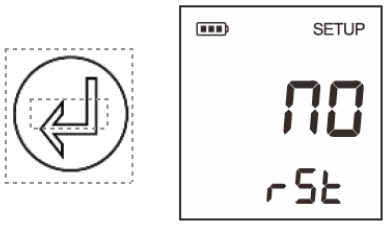
If the auto-hold function is enabled, the unit will automatically sense a stable endpoint reading and freeze the reading in the display. If you disable this function, the unit allows user to freeze the reading in the display manually by pressing the HOLD key.

8. Press CAL key to enable or disable the auto-hold function. Press ENTER key to confirm; the display shows “YES/OFF” indicating that the auto-off function is enabled.



When the auto-off function is enabled, if no key is pressed for 8 minutes, the unit will automatically turn off to conserve power.

9. Press CAL key to enable or disable the auto-off function. Press ENTER key to confirm; the display shows “NO/RST” indicating the current status of the reset function.



WARNING:
The Reset function will restore the unit back to factory default settings; all calibration values and selected parameters will be reset.

10. Press CAL key to enable or disable the reset function. Press ENTER key to confirm; the unit returns to measurement mode.

EXIT THE SETUP MENU:
During the setup mode, to exit the setup menu, press ON/OFF key; the unit will return to measurement mode immediately.

CONDUCTIVITY CALIBRATION

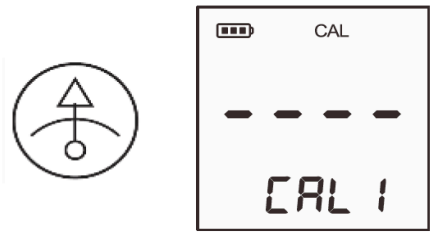
The HL102 pocket EC/TDS/temperature tester allows up to 3 point calibration in the conductivity mode. To ensure higher accuracy, we recommend that you perform a 3 point calibration, or select a calibration standard concentration close to the sample value you are measuring. For typical environmental freshwater samples, 1413µS/cm should be sufficient. The unit will automatically detect these conductivity standard solutions and prompt the user to calibrate the meter. When the calibration is done, all new calibration values will automatically override existing data. The following table shows acceptable conductivity ranges of calibration solution for each measuring range.

MEASURING RANGE	CALIBRATION SOLUTION RANGE	DEFAULT
0~20µS/cm	7~17µS/cm	10µS/cm
20~200µS/cm	70~170µS/cm	84µS/cm
200~2000µS/cm	700~1700µS/cm	1413µS/cm
2~20mS/cm	7~17mS/cm	12.88mS/cm

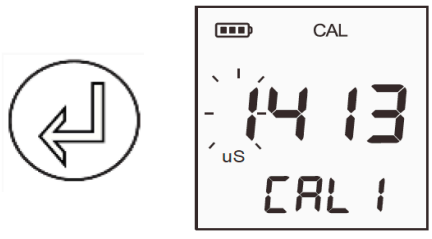
Ensure that you use fresh conductivity standard solution during the calibration. Do not reuse calibration solutions as it may be contaminated and affect the calibration and accuracy of measurement.

SINGLE POINT CALIBRATION

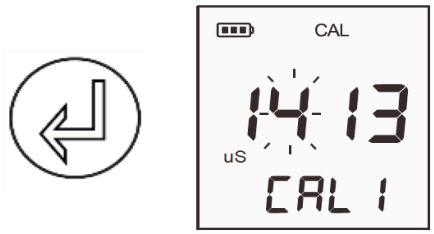
1.1 Rinse the conductivity electrode with distilled water, then rinse with a small amount of calibration solution.
1.2 Press CAL key; the unit enters calibration mode.



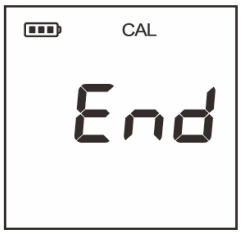
1.3 Immerse the conductivity electrode in the calibration solution; the unit immediately displays current calibration standard (e.g., 1413µS/cm).
1.4 Press ENTER key; the default calibration value begins flashing.



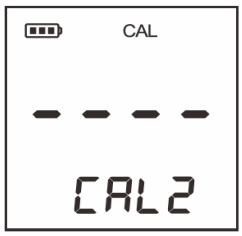
1.5 Press CAL key to set each digit, press ENTER key to confirm. When the setting is done, ensure the displayed value matches the chosen calibration standard.



1.6 Press ENTER key to start the calibration. Wait for the reading to stabilise; the display shows “END”. The unit returns to measurement mode automatically. Single point calibration is completed.



2 POINT CALIBRATION:
2.1 Ensure that 2 point calibration is selected in the setup menu.
2.2 Repeat steps 1.2 to 1.6 above; when the first calibration point is done, the display will show “CAL2”. The unit prompts you to continue with second point calibration.



2.3 Immerse the conductivity electrode in the calibration solution, the unit automatically shows current calibration standard (e.g., 84µS/cm).

2.4 Press ENTER key; the default calibration value begins flashing.
2.5 Press CAL key to set each digit, press ENTER key to confirm. When the setting is done, ensure the displayed value matches the chosen calibration standard.
2.6 Press ENTER key to start the calibration. Wait for the reading to stabilise; the display shows “END”. The unit returns to measurement mode. Second point calibration is completed.

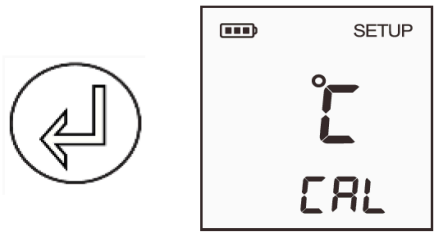
POINT CALIBRATION

3.1 If 3 point calibration is selected in the setup menu, when second calibration point is done, the display will immediately show “CAL3”. The unit prompts to continue with third point calibration.
3.2 Repeat the above steps until the display shows “END”, the unit returns to measurement mode. Calibration is completed.
Note: Performing the conductivity calibration will simultaneously calibrate the corresponding TDS and salinity values.

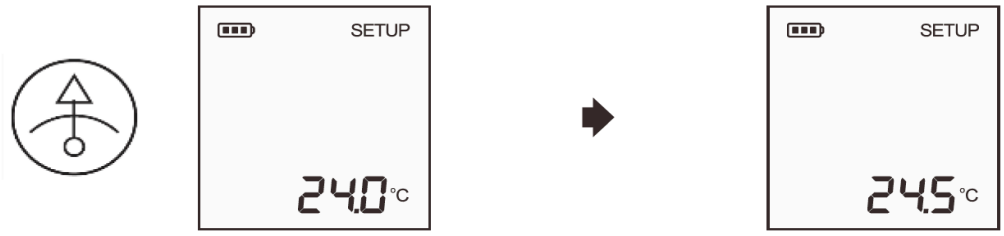
Temperature Calibration

During the measurement, if the temperature reading displayed differs from that of an accurate thermometer, you need to calibrate the unit.

1. Press and hold the CAL key for 3 seconds to enter setup menu.
2. Press ENTER key until unit shows the “oC/CAL” or “oF/CAL”.



3. Press CAL key to enter the temperature calibration mode.
4. Press CAL key again to set temperature value (Resolution: 0.5oC).



5. Press ENTER key to confirm, the display shows next option.
6. Press ON/OFF key, the unit returns to measurement mode. Calibration is completed.

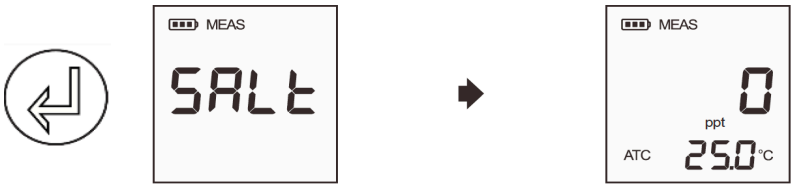
EXIT THE CALIBRATION

During the calibration process, if you want to exit the calibration, press ON/OFF key, the unit will return to measurement mode.

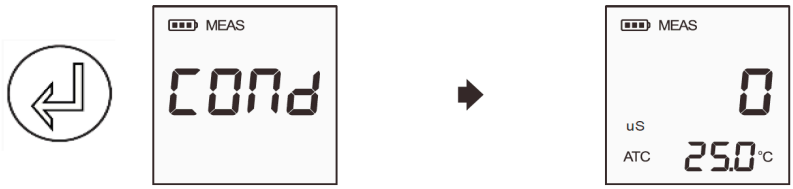
SWITCHING MEASUREMENT MODE

1. In the conductivity mode, press ENTER key until the display shows “TDS”. The unit enters TDS measurement mode.

2. Press ENTER key, the unit enters the salinity measurement mode.



3. Press ENTER key again, the unit returns to conductivity measurement mode.

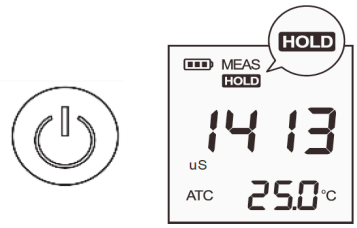


MEASUREMENT

Rinse the conductivity electrode with distilled water. Immerse the electrode into the sample solution. Stir the solution gently. Wait for the reading to stabilise; record the measured value as displayed.

HOLD FUNCTION

The HL102 pocket EC/TDS/temperature tester contains two data hold modes. When the Auto-Hold function is enabled, the unit will automatically sense a stable endpoint reading and freeze it; the “HOLD” indicator appears on the display. If the Auto-Hold function is disabled, press HOLD key, the unit will immediately freeze the currently displayed value. Press the HOLD key again to resume measuring.



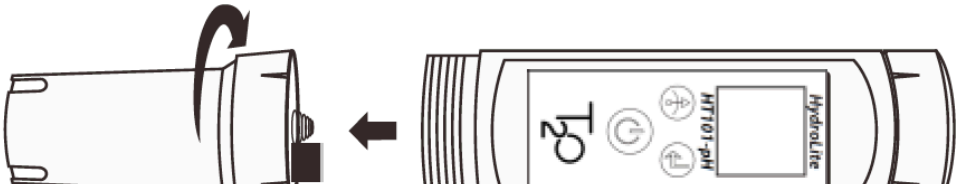
ELECTRODE CARE AND MAINTENANCE

- After each use, the conductivity electrode should be rinsed thoroughly in deionised water.
- If there is a build-up of solids inside the measurement area of the cell, these should be removed very carefully with a cotton bud soaked in solvent, taking care not to touch the metal parts of the inner cell.

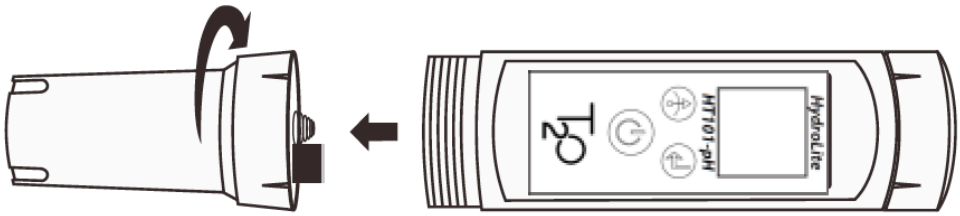
ELECTRODE REPLACEMENT

When the unit fails to calibrate or gives fluctuating readings for calibration standards, you need to replace the electrode module.

1. Twist the electrode collar counter clockwise, pull the old electrode module away from the unit.



2. Align the slot on the new electrode module, gently push the module into the unit.

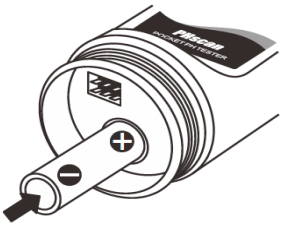


3. Twist the electrode collar clockwise until it is tight. Installation is completed.

Replacing the Batteries:

If the battery indicator disappears during the use, the batteries require replacing.

1. Twist the electrode collar counter clockwise, pull the electrode module out from the unit.
2. Insert two “AAA” batteries into the battery compartment (note polarity).



3. Align the slot on the electrode module, push the electrode into the unit.
4. Twist the electrode collar clockwise until it is tight.

Troubleshooting

LCD DISPLAY	CAUSE	CORRECTIVE ACTION
● ● ●	Electrode dried out Measured value is out of range	Soak the conductivity electrode in tap water for 10 minutes Check the electrode whether clogged, dirty or broken
Err	Incorrect calibration solutions	Using the fresh conductivity standard solutions for calibration
	Setting value does not match calibration solution	Reset the calibration value
	Electrode is broken	Replace the electrode module

Specifications

Conductivity	Model	HL102
	Range	0~20.00, 200.0, 2000μS/cm, 20.00mS/cm
	Accuracy Resolution	±1% F.S 0.01, 0.1, 1
	Calibration Points	1 to 3 points
	Calibration Solutions	10μS/cm, 84μS/cm, 1413μS/cm, 12.88mS/cm
TDS	Range Accuracy	0~10ppt (Max. 20ppt, depending on factor setting) ±1% F.S
	TDS Factor	0.1~1.0 (Default 0.5)
Salinity	Range	0~10ppt
	Accuracy Resolution	±1% F.S 0.01ppt
Temperature	Range	0~60°C, 32~140°F
	Accuracy	±1°C
	Resolution	0.1°C, 0.1°F

	Calibration Points	1 point
	Calibration Range	Measured value ±10°C
Others	Temperature Compensation	0~60°C, 32~140°F
	Temperature Coefficient	2%/°C
	Cell Constant	K=1
	Normalization Temperature	25°C
	Hold Function	Manual or Automatic
	Power Off	Manual or Automatic (8 minutes after last key pressed)
	Sensor Type	Order Code: HL102ELEC
	Power Requirements	2×1.5V "AAA" Batteries
	Dimensions	185(L)×40(Dia.)mm
	Weight	100g

Calculation of TDS conversion factor:
To determine the TDS conversion factor use the following formula:

$$\text{Factor} = \frac{\text{Actual TDS}}{\text{Actual Conductivity @ 25ºC}}$$

Where:
Actual TDS: value from the high purity water and precisely weighed NaCl or KCL reagent. Actual Conductivity: the measured conductivity value.

For example:
Dissolve 64 grams of potassium chloride reagent in 1L distilled water. If its conductivity value is 100mS/cm, then TDS conversion factor is 0.64.