

Model H10C
Instruction Manual



Microprocessor based
Conductivity, TDS, Salinity, Temperature
Hand Held Meter

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Contents

General Introduction	2
Initial Inspection	2
Waterproof	2
Installing the Batteries.....	3
Displays and Key Functions.....	4
Keys.....	5
OPERATIONAL PROCEDURES	6
A. Preparing Standard Solutions	6
B. Calibration	6
a. TDS	6
b. CELL	7
c. Temperature Coefficient	7
d. Temperature Reference	7
e. Conductivity Calibration.....	7
C. Conductivity Measurements	8
Error Displays and Troubleshooting	8
Specifications.....	9
Warranty.....	10

General Introduction

Thank you for choosing the ECD Model H10C conductivity instrument. The Model H10C is a precision tool for measuring conductivity, salinity, TDS and temperature. A built-in microprocessor stores, calculates and compensates for all parameters related to conductivity and temperature determinations.

The H10C has an IP67 waterproof case. The mechanical keys are highly reliable with tactile and audio feedback. This meter is powered by four “AAA” batteries. Re-calibration is not required when power is restored.

The front of the meter has a large LCD that displays temperature and either temperature compensated or non-temperature compensated conductivity, salinity or TDS simultaneously with user prompts and mode indicators. The unit prompts the user through calibrations and measurement procedures.

The Model H10C is available with a single four wire conductivity cell that measures from 2 μ S to 200 mS. Its features include automatic conductivity ranging, automatic temperature compensation, long battery life and 50/60 Hz AC noise rejection. This unit is universal in application and user friendly for field, industrial and laboratory applications.

Initial Inspection

Carefully unpack the unit and accessories. Inspect for damages made in shipment. If any damage is found, notify your **ECD** representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

Waterproof

Though the Model H10C meter is housed in a watertight case, **DO NOT** use it underwater. The watertight case prevents permanent damage to the unit if accidentally dropped into non-corrosive solutions.

Follow these steps immediately if the unit is immersed in any solution:

1. Rinse unit carefully with distilled water. After rinsing and drying, inspect and clean connectors to remove all contaminants that may affect probe connections.
2. Wait for the unit and probe to dry completely before resuming operation.
3. If the unit does not function correctly after steps 1 and 2, call ECD for possible repair or replacement (see Warranty).

Installing the Batteries

The Model H10C meter is packaged with 4 “AAA” alkaline batteries required for operation. To insert the batteries into the meter, follow the procedure outlined below.

1. Use a screw driver to remove the two screws and battery cover to expose the battery compartment. (Figure 1)
2. Note the polarity and insert the batteries into the battery compartment correctly.
3. Replace the battery cover and make sure to secure the two screws for the water-tight feature.

[Note: Press the “On/Off” key to turn the unit on. If the unit is running then you can press the “On/Off” key to turn the unit off. The unit will automatically turn off after 20 minutes of no key activity.]

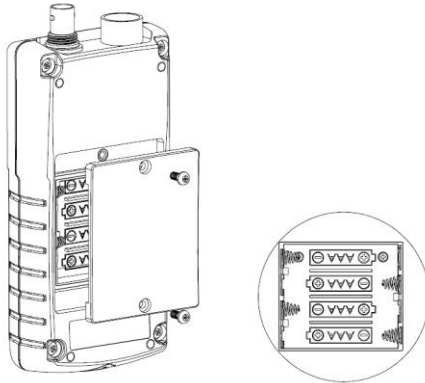
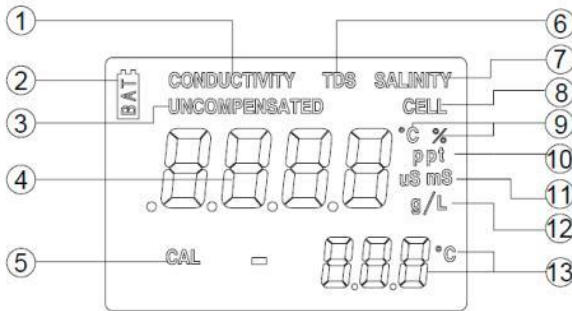




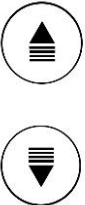


Figure 1

Displays and Key Functions



<p>1. CONDUCTIVITY- Displays when measuring conductivity</p>	<p>8. CELL- Indicates conductivity cell constant value</p>
<p>2. BAT- Low Battery Indicator</p>	<p>9. °C/%- Displays during calibration: °C: Indicates temperature reference unit. %: Indicates temperature coefficient unit.</p>
<p>3. UNCOMPENSATED- Distinguishes between temperature compensated and uncompensated readings</p>	<p>10. ppt- Parts per thousand; indicates salinity measurement.</p>
<p>4. MAIN DISPLAY- Displays conductivity, salinity and TDS numerical values</p>	<p>11. uS/mS- Microsiemens or millisiemens, indicates conductivity measurement.</p>
<p>5. CAL- Calibration mode indicator</p>	<p>12. g/L- Grams/Liter; indicates TDS measurement.</p>
<p>6. TDS- Displays when Total Dissolved Solids is being measured</p>	<p>13. Temperature and unit display</p>
<p>7. SALINITY- Displays when salinity is being measured</p>	

Keys

	<p>On/Off- Powers on and shuts off the meter.</p>
	<p>Mode- Selects display mode. In normal operation, press Mode to sequentially display compensated conductivity, salinity, total dissolved solids (TDS) and uncompensated conductivity. In calibration mode, this key exits the current calibration and displays the next calibration parameter.</p>
	<p>Up/Down- Increases or decreases the displayed value as desired</p>
	<p>Cal- In normal operation, changes the mode from Normal to Calibration.</p>
	<p>Enter- In Calibration Set-up, press this key to save the current parameter to memory.</p>

OPERATIONAL PROCEDURES

A. Preparing Standard Solutions

Suitable conductivity standards are available commercially or the user can prepare them using research grade reagents.

Here are some standard solutions the user can prepare to calibrate the probe of the model H10C.

1. Standard solution of 1413uS at 77°F (25°C): Accurately weight out 0.746 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.
2. Standard solution of 12.90mS at 77°F (25°C): Accurately weight out 7.4365 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.
3. Standard solution of 111.9mS at 77°F (25°C): Accurately weight out 74.264 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.

[Note: You can store the remaining solution in a plastic container for one week but the air space between the cap and the solution must be kept to an absolute minimum. Storing the excess solution below 39°F (4°C) can increase the storage life. If you have any doubt of the accuracy of the stored solution, a fresh batch should be prepared.]

B. Calibration

Calibration setup contains five sections: TDS, Cell, Temperature Coefficient, Temperature reference and Conductivity Calibration. To access these sections:

1. Connect the conductivity probe, PN 2008210, to the unit and turn the unit on. The screen will display **CELL** and the cell constant of the conductivity probe.
2. Allow temperature reading to stabilize, press "**Cal**" key to enter the calibration mode. **CAL** appears on the LCD. Press "**Mode**" key to sequentially display the following sections:

[Note: Press "**Enter**" key to accept any values changes in each section and automatically advance to the next section. If there are no changes, the unit accepts the current value and proceeds to the next section.]

a. TDS

TDS is determined by multiplying conductivity (mS) by a TDS factor. The default factor value is 0.65. To change the TDS factor, use the up and down keys to adjust the value between 0.30 and 1.00. Press "**Enter**" key to save the new value, or press "**Mode**" key to cancel the change and display the **CELL** screen.

b. CELL

The second screen will display **CELL** and the current cell value. The default cell value is 0.50 and is displayed in the lower right of the screen. The unit allows a variance of +/- 0.15 before displaying an error message. The cell value can't be adjusted at this screen; calibrating conductivity is the only way to adjust the cell constant. Press "**Enter**" key to reset the cell constant to 0.50 and display the **Temperature Coefficient** screen.

[Note: Be certain to press "**Enter**" key to reset the cell constant to 0.50. If "**Mode**" key is pressed, the unit retains the previous cell constant and calibrates from a value that is already offset.]

c. Temperature Coefficient

The meter uses the temperature coefficient to calculate temperature compensated conductivity. The default value is 1.91%. To change the temperature coefficient, use the up and down keys to adjust the value between 0 and 4.00%. Press "**Enter**" key to save the new value, or press "**Mode**" key to cancel the change and display the **Temperature Reference** screen.

d. Temperature Reference

The unit uses the temperature reference value to calculate temperature compensated conductivity. The default value is 77°F (25°C). To change the temperature coefficient, use the up and down keys to adjust the value between 59 and 77°F (15 and 25°C). Press "**Enter**" key to save the new value, or press "**Mode**" key to cancel the change and display the **Conductivity Calibration** screen.

e. Conductivity Calibration

1. Immerse the probe in a standard of known conductivity, preferably a standard in the middle range of the solutions to be measured. Immerse the probe (at least 2" to 3" or 5~7cm from the tip) without touching the sides of the calibration container. Shake the probe lightly to remove any air bubbles trapped in the conductivity cell.
2. Allow temperature to stabilize. The message "rAGE" (range) may display briefly to indicate unit auto-ranging; this is normal. After temperature stabilization, use the up and down keys to adjust the conductivity value to that of the conductivity standard at 77°F (25°C). Press "**Enter**" key to calibrate. The unit beeps twice to indicate a successful calibration, then automatically switches to normal operation mode.

C. Conductivity Measurements

1. Turn the unit on. Place the probe in the solution to be measured. Immerse the probe (at least 2" to 3" or 5~7cm from the tip). Shake the probe lightly to remove any trapped air bubbles in the conductivity cell.
2. Press "**Mode**" key to enter the desired measurement mode. The message "rAGE" (range) may appear briefly on the display indicate auto-ranging; this is normal. Allow temperature to stabilize before taking measurements.

Error Displays and Troubleshooting

Main Display	Secondary Display	Possible Cause	Corrective Action
"over" during Measurement	/	<ul style="list-style-type: none"> ● Conductivity is > 200mS. ● Salinity is >70.0 ppt. 	<ul style="list-style-type: none"> ● Ensure the probe is immersed at least 2"~3" or 5~7cm from the tip, below the surface of the sample/standard solution. ● Allow sufficient time for the electrode and Temp probe to stabilize.
"over" during Calibration	/	Cell Constant or Calibration solution is out of range.	<ul style="list-style-type: none"> ● Recalibrate with correct value for the conductivity standard. ● Replace conductivity standard. ● Clean cell
"over" during Measurements	Over	Temperature is > 194°F (90°C)	Decrease the sample temperature
	undr	Temperature is < 14°F (-10°C)	Increase the sample temperature

[Note: If the unit still does not perform normally after the above measures are taken, call ECD Service Department.]

Specifications

Display	Range	Resolution	Accuracy
Conductivity	0.0 to 499.9uS/cm	0.01uS/cm	±1% of reading + 2uS/cm
	500 to 4999uS/cm	1uS/cm	±1% of reading + 5uS/cm
	5.00 to 49.99mS/cm	0.01mS/cm	±1% of reading + 0.05mS/cm
	50.0 to 200.0mS/cm	0.1mS/cm	±2.5% of reading + 0.5mS/cm
Salinity	0.0 to 70.0ppt	0.1ppt	±0.2% Full Scale
Temperature	14°F to 194°F (-10.0 to 90.0 °C)	0.1 °C	±0.2°C or ±0.4% Full Scale, whichever is greater.

Reference Temperature	59 to 77°F (15.0 to 25.0 °C)
Temperature Coefficient	0.0% to 4.0%
Cell Constant	0.5 ± 0.15
TDS Constant Range	0.30 to 1.00, default at 0.65
Power	Four “AAA” Batteries
Calibration Back-up	EEPROM
Audio Feedback	All Touch Keys
Display	2" x 1 3/8" LCD
Ambient Temperature	0 to 50 °C
Relative Humidity	up to 90%
Case	IP67 water tight case
Dimensions (W x D x H)	3.0" x 6.2" x 1.4" (75mm x 157mm x 35mm)
Weight	8.1 oz (230 g) (Batteries included)

Warranty

Electro-Chemical Devices, Inc. (ECD) warrants all products it manufactures to be free from defect in materials and factory workmanship, and agrees to repair or replace any product that fails to perform, as specified, within one (1) year after date of shipment. This warranty shall not apply to any product that has been:

1. Subjected to misuse, negligence or accident;
2. Connected, installed, adjusted or otherwise used not in accordance with the instructions furnished by ECD;
3. Repaired, modified or altered by persons not authorized by ECD, resulting in injury to the performance, stability or reliability of the product.

This warranty is in lieu of any other warranty, expressed or implied. ECD reserves the right to make changes in the design or construction of its products at any time, without prior notification, and without incurring any obligation to make any changes in previously delivered products.

Seller's sole liabilities and the buyer's sole remedies under this agreement shall be limited to a refund in the purchase price, or at ECD's discretion, to the repair or replacement of any product that proves, upon ECD's examination, to be defective, when returned to the factory, transportation prepaid by the buyer, within one (1) year of the product's original shipment date. Seller shall not be liable for damages consequential or incidental to defects in any product, for failure of delivery in whole or in part, for injuries resulting from its use, or for any other cause.

This warranty and the writing attached constitute the full understanding of seller and the buyer, and no terms, conditions, understanding, or agreement purporting to modify or vary the terms hereof shall be binding unless hereafter made in writing and signed by an authorized official of Electro-Chemical Devices, Inc.

This warranty does not cover pH, ORP or Specific Ion measurement, reference or combination electrodes or electrode cartridges that have been commissioned in service. If service or repair is required, please obtain the serial number(s) or sales order number of the product(s) in question and contact ECD's Service Department at: +1-800-729-1333 (USA/Canada) or +1-714-695-0051.



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