



ECscan20/30/40 Pocket Conductivity Tester

# USER MANUAL



## Overview

Thank you for selecting the ECscan series pocket conductivity tester, this product series includes models below.

Model	Measurement Parameters
ECscan20	Conductivity
ECscan30	Conductivity, TDS
ECscan40	Conductivity, TDS, Salinity

This user manual provides a step-by-step guide to help you operate the tester, please carefully read the following instructions before use.

### Battery Charging

1. Take out the tester and remove the battery compartment lid.
2. Insert the USB cable into the connector.



3. When the battery is fully charged, the tester will show *FULL* and the indicator light on the power adapter will automatically change color.

### ⚠️ IMPORTANT NOTICE

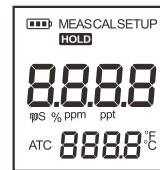
To ensure safe use, the power adapter for charging must meet the specifications of DC 5V, 500 mA. Using a higher-power adapter may cause battery damage and pose safety hazards.

The tester requires approximately 2 hours to fully charge. If charging takes significantly longer than this, stop immediately and inspect the tester to ensure safety.

## Keypad

Key	Function
	<ul style="list-style-type: none"> <li>• Switch the tester on or off</li> <li>• Lock or unlock measurement</li> <li>• Exit the calibration, settings and return to the conductivity measurement</li> </ul>
	<ul style="list-style-type: none"> <li>• Start calibration</li> <li>• Press and hold the key to enter the setup menu</li> <li>• Select an option</li> </ul>
	<ul style="list-style-type: none"> <li>• Confirm the calibration, settings or displayed option</li> <li>• Toggle between available measurement modes</li> </ul>

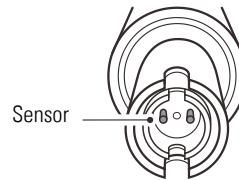
## Display



Icon	Description
	When the battery voltage falls below the minimum power requirement, the icon will flash continuously and the display will show <i>LOW</i> .
	Indicates that the tester is in the measurement mode
	Indicates that the tester is in the calibration mode
	Indicates that the tester is in the setup mode
	Indicates that the automatic temperature compensation is enabled

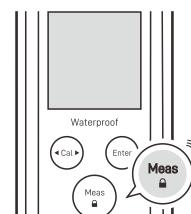
## Prior to Use

Remove the protective cap from the bottom of the tester. If the sensor has dried out, soak the electrode for about 10 minutes in tap water.



## Switching the Tester On and Off

- Press and hold the **Meas** key for about 5 seconds to switch on the tester.
- Press and hold the **Meas** key to switch off the tester.



If you do not press any key within 8 minutes, the tester will switch off automatically to conserve energy.

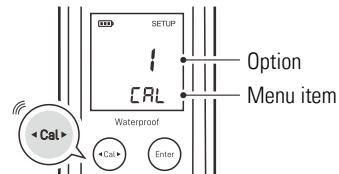
## Setup Menu

The ECscan series tester contains 7 menu items in the setup menu, the following table describes the functions of each option.

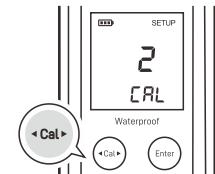
Menu Item	Option and Description						
<b>Calibration Points</b>							
Set the number of calibration points.							
<b>  CRL</b>	<table border="1"> <tr> <td>1</td><td>1 point (default)</td></tr> <tr> <td>2</td><td>2 points</td></tr> <tr> <td>3</td><td>3 points</td></tr> </table>	1	1 point (default)	2	2 points	3	3 points
1	1 point (default)						
2	2 points						
3	3 points						
<b>TDS Factor</b>							
Set the default TDS conversion factor.							
<b>  tds</b>	0.5      0.1 to 1.0%/°C (default 0.5)						
<b>Measurement Unit</b>							
Set the default temperature unit.							
<b>  UR/TE</b>	<table border="1"> <tr> <td>°C</td><td>Degrees Celsius (default)</td></tr> <tr> <td>°F</td><td>Degrees Fahrenheit</td></tr> </table>	°C	Degrees Celsius (default)	°F	Degrees Fahrenheit		
°C	Degrees Celsius (default)						
°F	Degrees Fahrenheit						
<b>Temperature Calibration</b>							
Refer to page 3.							
<b>  CRL</b>	<table border="1"> <tr> <td>°C</td><td>Reading ±10°C</td></tr> <tr> <td>°F</td><td>Reading ±10°F</td></tr> </table>	°C	Reading ±10°C	°F	Reading ±10°F		
°C	Reading ±10°C						
°F	Reading ±10°F						
<b>Auto-Hold</b>							
If enabled, the tester will automatically sense and lock the measurement endpoint.							
<b>  HOLD</b>	<table border="1"> <tr> <td>YES</td><td>Enable</td></tr> <tr> <td>NO</td><td>Disable (default)</td></tr> </table>	YES	Enable	NO	Disable (default)		
YES	Enable						
NO	Disable (default)						
<b>Auto-Power Off</b>							
If enabled, the tester will automatically switch off if no key is pressed within 8 minutes.							
<b>  OFF</b>	<table border="1"> <tr> <td>YES</td><td>Enable (default)</td></tr> <tr> <td>NO</td><td>Disable</td></tr> </table>	YES	Enable (default)	NO	Disable		
YES	Enable (default)						
NO	Disable						
<b>Factory Reset</b>							
If enabled, all of the calibration values and current settings will be deleted or reset to the factory defaults, the tester must be recalibrated.							
<b>  rSet</b>	<table border="1"> <tr> <td>YES</td><td>Enable</td></tr> <tr> <td>NO</td><td>Disable (default)</td></tr> </table>	YES	Enable	NO	Disable (default)		
YES	Enable						
NO	Disable (default)						

### Setting the Default Option

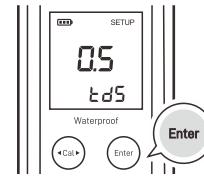
1. In the measurement mode, press and hold the **Cal** key to enter the setup menu.



2. If necessary, press the **Cal** key again to select an option.



3. Press the **Enter** key, the tester saves the current option and moves to the next menu item.



4. Repeat steps above until the tester returns to the measurement mode.



- During the setting process, if you do not need to calibrate the temperature, press the **Enter** key to skip the °C/CRL or °F/CRL option.
- To exit the setup menu, press the **Meas** key.

## Conductivity Calibration

The ECscan series tester allows up to 3 points calibration. For better accuracy, we recommend that you perform 3 points calibration or select a standard solution closest to the sample conductivity you are measuring. The tester will automatically detect the calibration standard and prompt the user to perform the calibration. When the calibration is completed, all new calibration values will automatically override existing data.

The following table shows acceptable conductivity range of standard solution for each measurement range.

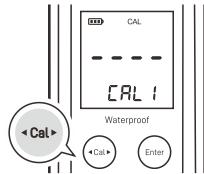
Measurement Range	Standard Solution Range	Default
0 to 200 $\mu\text{S}/\text{cm}$	70 to 170 $\mu\text{S}/\text{cm}$	84 $\mu\text{S}/\text{cm}$
200 to 2000 $\mu\text{S}/\text{cm}$	700 to 1700 $\mu\text{S}/\text{cm}$	1413 $\mu\text{S}/\text{cm}$
2 to 20 $\text{mS}/\text{cm}$	7 to 17 $\text{mS}/\text{cm}$	12.88 $\text{mS}/\text{cm}$

Make sure that using the fresh standard solution during the calibration. DO NOT reuse the standard solution after calibration, contaminants in solution will affect the calibration and eventually the accuracy of the measurement.

### Single Point Calibration

Ensure that you have selected 1 point calibration in the setup menu.

1. Press the **Cal** key, the tester shows ----/CAL 1.



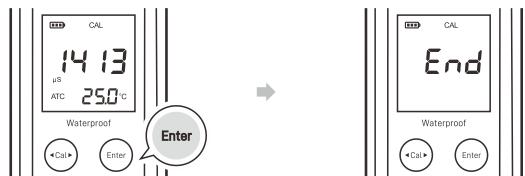
2. Rinse the electrode with distilled water and place into the standard solution. Stir tester gently to remove air bubbles trapped in the slot of the sensor. The tester will automatically recognize the standard solution and show the calibration value.



3. Press the **Enter** key, the default calibration value begins flashing.
4. If necessary, press the **Cal** key to modify the calibration value, press the **Enter** key to confirm and move to the next digit. When the setting is completed, make sure that the displayed value matches the calibration standard.



- 1.5 Press the **Enter** key, the tester begins the calibration. When the reading has stabilized, the display will show **End**. Calibration is completed.



### Multipoint Calibration

Ensure that you have selected 2 or 3 points calibration in the setup menu.

- 2.1 Repeat steps 1.1 through 1.5 above. When the first calibration point is completed, the display will show ----/CAL 2, the tester prompts you to continue with second point calibration.
- 2.2 Repeat steps 1.2 through 1.5 above until the display shows **End**. Calibration is completed.

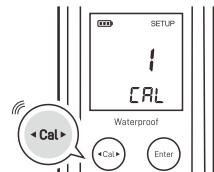


Performing the conductivity calibration will simultaneously calibrate the corresponding TDS and salinity values. To exit the calibration without saving calibrated values, press the **Meas** key.

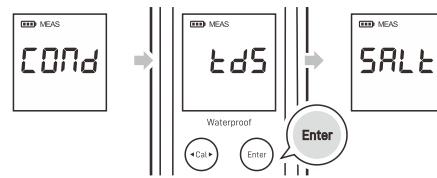
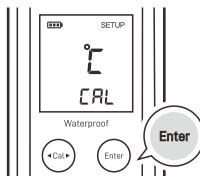
## Temperature Calibration

The ECscan series tester is installed with a built-in temperature sensor for automatic temperature compensation. During the measurement, if the measured temperature reading differs from that of an accurate thermometer, the tester needs to be calibrated.

1. Press and hold the **Cal** key to enter the setup menu.



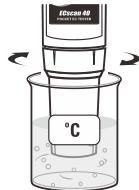
2. Press the **Enter** key until the display shows **°C/CAL** or **°F/CAL**.



3. Press the **Cal** key, the tester enters the temperature calibration mode.



4. Place the electrode into a solution with a known accurate temperature and wait for the measurement to stabilize.



5. Press the **Cal** key to modify the temperature value.



6. Press the **Enter** key to save and press the **Meas** key to return to the measurement mode.

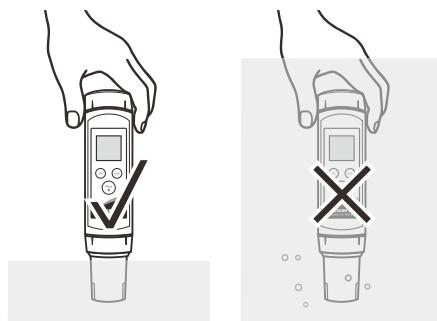


## Measuring the Sample

Rinse the electrode with distilled water, place the electrode into the sample solution and stir gently, make sure that no air bubbles on the sensor surface. Wait for the measurement to stabilize and record the reading.



- During the measurement, DO NOT completely immerse the tester in water.



- If the display shows ---- indicating the measurement exceeds the range, remove the tester from the sample immediately.
- If the **HOLD** option is enabled in the setup menu, the tester will automatically lock the measurement endpoint and show **HOLD** icon. Press the **Meas** key to resume measuring.



## Measurement

### Switching the Measurement Mode

Press the **Enter** key, the tester will show **COND** (conductivity), **TDS** (TDS), **SALT** (salinity) and switch to the corresponding measurement mode automatically.

## Electrode Maintenance and Replacement

- Rinse the electrode thoroughly with distilled water after use.
- Do not touch the platinum black coating on the sensor surface and always keep it clean.
- If there is a build-up of solids inside the sensor, remove carefully, then recalibrate the tester.
- If you do not use the tester for long periods, remove the batteries.

### Replacing the Electrode

If the tester fails to calibrate or gives fluctuating readings, you should consider replacing the electrode.

1. Twist the electrode collar counter clockwise, pull the electrode away from the tester.



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



3. Twist the electrode collar clockwise until tight.



## Appendix

### Preparation of Conductivity Standard Solutions

Place the analytical grade potassium chloride (KCl) in a beaker and dry in an oven for about 3 hours at 105°C (221°F), then cool to room temperature. Add the reagent to a 1 liter volumetric flask according to the instructions in table below. Fill the distilled water to the mark, mix the solution until the reagent is completely dissolved.

Conductivity Standard	Reagent	Weight
84 µS/cm	KCl	42.35 mg
1413 µS/cm	KCl	745.5 mg
12.88 mS/cm	KCl	7.45 g

### Calculating the TDS Conversion Factor

To determine the TDS factor of sample solution use the formula below.

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

For example:

Dissolve 64 grams of the potassium chloride (KCl) reagent in 1 liter distilled water. If measured conductivity is 100 mS/cm, then TDS factor is 0.64.

### Conductivity to TDS Conversion Factors

Conductivity at 25°C	TDS (KCl)		TDS (NaCl)	
	ppm	Factor	ppm	Factor
84 µS/cm	40.38	0.5048	38.04	0.4755
1413 µS/cm	744.7	0.527	702.1	0.4969
12.88 mS/cm	7447	0.5782	7230	0.5613

### Optional Accessories

Order Code	Description
E-ECscan-C1-10K	2-pole conductivity cell, K=1
ECCS-84	Standard solution 84 µS/cm, 480 ml
ECCS-1413	Standard solution 1413 µS/cm, 480 ml
ECCS-1288	Standard solution 12.88 mS/cm, 480 ml

### Tester Specifications

Conductivity	
Range	0 to 20.00, 200.0, 2000 µS/cm, 20.00 mS/cm
Resolution	0.01, 0.1, 1
Accuracy	±1% F.S.
Calibration Points	1 to 3 points
Calibration Solutions	84 µS/cm, 1413 µS/cm, 12.88 mS/cm
TDS	
Range	0 to 10.00, 100.0, 1000 ppm, max. 20.00 ppt
Resolution	0.01, 0.1, 1
Accuracy	±1% F.S.
TDS Factor	0.1 to 1.0
Salinity	
Range	0.00 to 10.00 ppt
Resolution	0.01
Accuracy	±1% F.S.

Temperature	
Range	0 to 60°C (32 to 140°F)
Resolution	0.1°C (0.1°F)
Accuracy	±1°C (±1.8°F)
Calibration Point	1 point
Calibration Range	Reading ±10°C/°F
Other Specifications	
Temperature Compensation	0 to 60°C (32 to 140°F), automatic
Temperature Coefficient	2%/°C
Reference Temperature	25°C
Cell Constant	K=1
Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	0 to 60°C (32 to 140°F)
Relative Humidity	< 80% (non-condensing)
IP Rating	IP54
Display	LCD, 21 × 21 mm (0.82 × 0.82 in.)
Power Supply	3.7V rechargeable battery
Auto-Off	8 minutes after last key pressed
Dimensions	185 (L) × 40 (Ø) mm (7.28 × 1.57 in.)
Weight	120g (4.2 oz.)

## Disposal

This product is required to comply with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and may not be disposed of in domestic waste. Please dispose of product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.



## Warranty

The warranty period for tester is one year from the date of shipment.

Above warranty does not cover the electrode and standard solutions.

Out of warranty products will be repaired on a charged basis.

The warranty on your tester shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the products

For more information, please contact the supplier.



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