ECscan20/30/40 Pocket Conductivity Tester

Instruction Manual

Overview

Thank you for selecting the ECscan series pocket conductivity tester. This manual provides a step-by-step guide to help you operate the instrument, please carefully read the following instructions according to the model you have purchased.

Installing the Batteries

1. Twist the electrode collar counter clockwise, pull the electrode away from the tester.
2. Insert the two AAA batteries into the battery compartment, note polarity.
3. Push the electrode into the tester and twist the electrode collar clockwise until tight.

Keypad

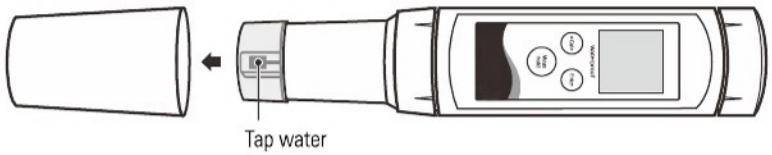
Key	Function
Meas Hold	• Switch the tester on or off • Lock the reading, press the key again to resume measurement • Exit the calibration, setting and return to the measurement mode
◄ Cal ►	• Start calibration • Press and hold the key to enter the setup menu • Select an option
Enter	• Confirm the calibration, setting or displayed option • Toggle between available measurement modes (only for ECscan30 and 40 testers)

Display

Icon	Description
	When the battery voltage falls below the minimum power requirements, the icon automatically disappears
MEAS	Indicates that the tester is in the measurement mode
CAL	Indicates that the tester is in the calibration mode
SETUP	Indicates that the tester is in the setup mode
ATC	Indicates that the automatic temperature compensation is enabled

Prior to Use

- Remove the protective cap and translucent cover from the bottom of the tester.
- If the platinum 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.
- To disable the auto-power off function, refer to the ***Setup Menu*** section.

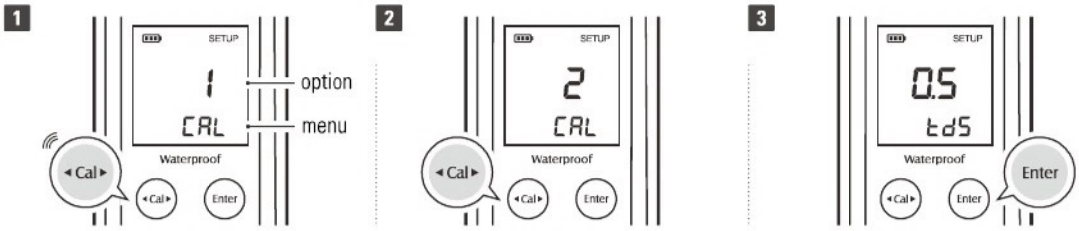
Setup Menu

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

Menu	Description	Options	Description	Default
CAL	Set the number of calibration points	1	1, 2 or 3 points	1 point
		2		
		3		
tdS	Set the TDS conversion factor	0.5	Range: 0.1 to 1.0 (only for ECscan30 and 40 testers)	0.5
UNIt	Set the temperature unit	°C	Degrees Celsius	°C
		°F	Degrees Fahrenheit	
CAL	Calibrate the temperature	°C	Reading ±10°C/°F	---
		°F		
HOLd	When the option is enabled, the tester will automatically sense a stable reading and lock the measurement	YES	Enable	Disable
		nO	Disable	
OFF	When the option is enabled, the tester will automatically switch off if no key is pressed within 8 minutes	YES	Enable	Enable
		nO	Disable	
rSt	Reset the tester to factory default settings	YES	Enable	Disable
		nO	Disable	

Setting the Default Option

1. In the measurement mode, press and hold the **Cal** key for 5 seconds 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 the steps above until the tester returns to the measurement mode.



- During the setting process, press the **Meas** key, the tester will exit the setup menu and return to the measurement mode.
- If you do not need to calibrate the temperature, press the **Enter** key to skip the °C/CAL or °F/CAL option.
- The rSt option is used to restore the tester back to the factory default settings. If enabled, all of the calibration data and user-specific settings will be deleted or reset, the tester must be recalibrated.

Conductivity Calibration

The ECscan series tester allows 1 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 µS/cm	70 to 170 µS/cm	84 µS/cm
200 to 2000 µS/cm	700 to 1700 µS/cm	1413 µS/cm
2 to 20 mS/cm	7 to 17 mS/cm	12.88 mS/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

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

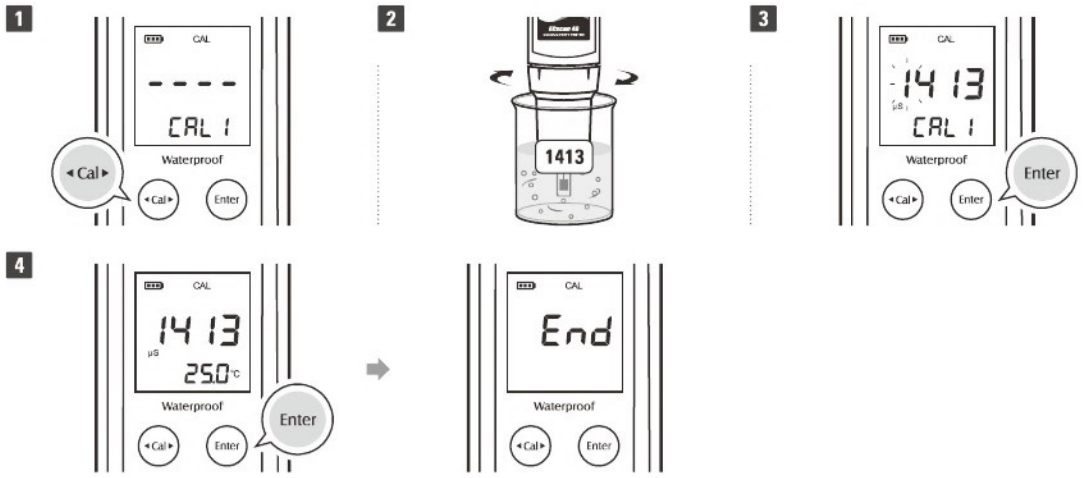
1.1 Press the **Cal** key, the tester enters the calibration mode, the display shows "----/CAL 1".

1.2 Rinse the electrode with deionized 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.

1.3 Press the **Enter** key, the default calibration value begins flashing.

1.4 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 matchs your 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

Make sure 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.

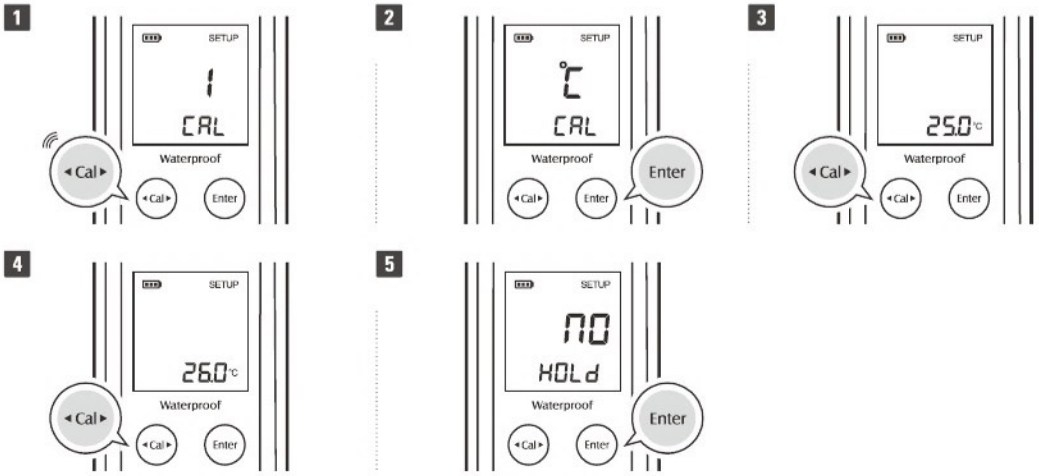
2.2 Repeat steps 1.2 through 1.5 above until the display shows "End". Calibration is completed.

- 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 has a built-in temperature sensor that used for automatic temperature compensation (ATC). 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 measurement is stable.
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.



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.

Measuring the Sample

Rinse the electrode with deionized 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.

- 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 a measurement endpoint and show HOLD icon. Press the **Meas** key to resume measuring.

Electrode Maintenance

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

Appendix

Preparation of Conductivity Standard Solutions

Place the analytical grade potassium chloride (KCl) reagent 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 litre volumetric flask according to the instructions in table below. Fill the deionized water to the mark, mix the solution until the reagent is completely dissolved.

Conductivity Standard	Reagent	Weight
146.5 µS/cm	KCl	47.4 mg
1413 µS/cm	KCl	745.9 mg
12.88 mS/cm	KCl	7.45 mg
111.8 mS/cm	KCl	74.5 mg

Calculating the TDS Conversion Factor

The following formula describes the calculation method of TDS conversion factor.

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

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

For example, dissolve 64 grams of KCl reagent in 1 litre deionized water. If measured conductivity value 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	Platinum conductivity electrode, cell constant K=1, measurement range: 10 µS/cm to 20 mS/cm
E-ECscan-C10-10K	Platinum conductivity electrode, cell constant K=10, measurement range: 100 µS/cm to 200 mS/cm
ECCS-84	Conductivity standard solution 146.5 µS/cm, 480 ml
ECCS-1413	Conductivity standard solution 1413 µS/cm, 480 ml
ECCS-1288	Conductivity standard solution 12.88 mS/cm, 480 ml
ECCS-1118	Conductivity standard solution 111.8 mS/cm, 480 ml

Specifications

Conductivity	Model	ECscan20	ECscan30	ECscan40
	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 Point	1, 2 or 3 points		
	Calibration Solution	84 µS/cm, 1413 µS/cm, 12.88 mS/cm		
TDS	Range	---	0 to 10.00, 100.0, 1000 ppm, 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 ppt
	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, reading ±10°C		
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	-5 to 60°C (23 to 140°F)		
	Relative Humidity	< 80% (non-condensing)		
	IP Rating	IP54		
	Display	Dual-line LCD, 21 × 21 mm (0.82 × 0.82")		
	Power Requirements	2 × 1.5V AAA alkaline batteries		
	Auto-Off	8 minutes after last key pressed		
	Dimensions	185 (L) × 40 (Dia.) mm (7.28 × 1.57")		
	Weight	100 g (3.5 oz.)		

Disposal

This tester 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 this 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.