

EC Field Standard Operating Procedure

Field SOP for Use of Electrical Conductivity Probe EC-CCWI**Meter description**

ID: EC-CCWI-1,2,3,4

Oakton ECTestr electrode, handheld "pen" style

Range 0 to 1999 uS

Resolution 10 uS

Automatic Temperature Compensation

How to Measure Conductivity – Oakton ECTestr

1. Remove cap and press ON/OFF button.
2. Dip electrode in stream*, making sure the sensor is fully covered. Do not submerge the fat end of the meter in the stream. This is where the batteries are housed and the meter can be ruined if water penetrates this end.
3. Wait for reading to stabilize, and record. Allow two minutes for stabilization. To freeze display, press HOLD. Pressing HOLD again will release the value.
4. Press ON/OFF to turn off tester. It will automatically turn off after 8.5 minutes to conserve energy.
5. Rinse electrode with Deionized Water.

***ALTERNATIVE:** If crouching and sampling instream is uncomfortable, consider using a sample cup. Use either the bucket on a rope, a pole sampler, or the plastic measuring cup provided. Rinse your bucket/cup twice with sample water, then pull your final sample. Leave the EC probe in the sample for about 2 minutes and ensure a stable number. You may leave the EC meter, pH meter and thermometer in the sampling device at the same time. Gently stir the meter a bit and watch that the numbers are stable before recording the result. Indicate in the check box on the data sheet under "EC" if you used this technique instead of direct sampling.

Trouble-shooting

Error Messages:

ER1: Weak Batteries, replace batteries (three 1.V batteries, located under screw off cap on opposite end from the electrode)

ER2: Wrong or bad buffer value, or electrode is failing

OR: Over range, send sample back to lab for testing with high range probe or dilution.

Experiencing Drift: let the electrode fully dry.

Improve Performance: Clean electrode in alcohol rinse for 10-15 minutes.

REMEMBER: If the meter malfunctions or you get a suspicious result, tell staff and note it on the datasheet. CCWI staff will run conductivity on your sample you return for nutrients to get a better reading, as water can be stored refrigerated for several days and maintain a stable conductivity.

What to expect

- As temperature increases, conductivity increases.
- Nitrates and phosphates slightly increase conductivity.
- As conductivity increases, Dissolved Oxygen decreases.
- Conductivity increases in the summer, particularly in isolated pools, as evaporation concentrates salts.
- Conductivity drops during storm events and is generally lower during winter months as rain dilutes salts in the water. Levels as low as 90 uS or less are not unusual.

- This meter reads in 10 uS, you should never get a reading in the "ones" place, ie. 64, 213 or 478. You **will** see 80, 100, 220, 480, 1200.

Natural Levels

- Distilled water: 0.5 to 3.0 $\mu\text{mhos/cm}$,
- Drinkable water: 30 to 1500 $\mu\text{mhos/cm}$
- Irrigation supply water: less than 750 $\mu\text{mhos/cm}$
- Streams with good mixed fisheries: 150 to 500 $\mu\text{mhos/cm}$.¹
- The State Water Board objective: 100 to 1300 $\mu\text{mhos/cm}$, depending on the water body.

Laboratory SOP: Calibration Oakton ECTestr Low & High

Calibration standard: 447uS @25°C Potassium Chloride solution (ECST-CCWI-1)

12,880 uS @25°C Potassium Chloride solution (ECST-CCWI-2)

Calibration frequency: Calibrated in lab, not field, before and after each deployment or excursion from CCWI office.

1. Open battery compartment lid (end with lanyard loop). The two white buttons are Increment (INC) and Decrement (DEC) calibration keys.
2. Rinse electrode in deionized water, shake off excess water, then dip it into a container of calibration standard.
3. Switch unit on (ON/OFF key). Wait several minutes for display to stabilize.
4. Press the INC or DEC keys to adjust reading to match the calibration standard value. For ECTestr Low, this should be 440-450 uS, and ECTestr High 12.90 mS
5. After 3 seconds without a key press, the display flashes 3 times, then shows "ENT". The tester accepts calibration value; returns to measurement mode.
6. Replace battery cap.
7. Discard standard solution from calibration container at least once a week and replace with fresh solution. Never pour used solution back into the original solution container.
8. Disposal of used solution: Okay to pour down drain. Non-reactive, non-flammable, no health hazards.