

Best Practice

Cleaning and Calibration of a Contacting Conductivity Sensor

Before you do anything, clean the sensor and rinse it thoroughly. Otherwise you are just changing numbers. Yes even sensors in Ultra-pure water need to be cleaned.

Keep this thought in mind before you make an adjustment: In general, you shouldn't need to calibrate a contacting conductivity cell, if you program the correct cell constant into the analyzer. C.C. = 0.00989. When you perform a calibration, the analyzer figures the conductivity is incorrect because the cell constant is incorrect. The analyzer will adjust the displayed conductivity value and re-calculate the new cell constant. Unless you change the area between the electrodes or the size of the electrodes, you cannot physically change the cell constant. So why is the conductivity reading incorrect? Most likely because the cell is dirty. Calibrating conductivity sensors is more about making the readings agree than it is about accuracy.

Typical cleaning solutions are:

- For normal applications, hot soapy water.
- For lime, hydroxides, etc... 5 – 10% solution of HCl. **NO**, if a little is good a lot is not better.
- Organic fouling (oils, fats, etc...) can be removed with acetone.
- For algae, bacteria or mold use a mild bleaching agent (Clorox).

Calibration – The Correct Way

- Select a standard with a conductivity value that is close to your sample. Conductivity standards can pick up contaminants from the air and the conductivity cell. Evaporation and dilution (water sticking to the cell) can have a large effect on the conductivity.
- Open the bottle for the minimum time necessary.
- It is recommended to calibrate in a clean chamber that is the same size as the measuring chamber.
- Clean and rinse the conductivity cell thoroughly with distilled/deionized water. Shake the cell to remove any excess water droplets.
- Pour approx. 50 ml of the standard into a clean calibration chamber (i.e. graduated cylinder) that has been rinsed with distilled/deionized water.
- Immerse the conductivity cell into the solution and stir the solution with the cell.
- Remove the cell, shake it to remove any water droplets and dump the calibration solution.
- Fill the calibration chamber with fresh standard and immerse the cell into the calibration chamber to a sufficient depth to cover the measuring electrodes. Stir the cell and move it up and down in the chamber to remove any trapped air bubbles.
- Take the reading when the solution is stagnant and make sure the temperature is stable.
- Conductivity is strongly influenced by temperature. To obtain the certified accuracy, the temperature must be kept at a constant value +/- 0.1 C, preferably using a temperature bath.

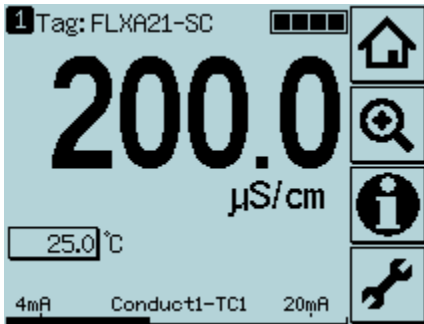
Simple Grab Sample Calibration

Using an SC72 Handheld Conductivity meter (or any handheld meter, don't use the cup style meters). Clean the electrode in acid as mentioned above. Rinse the electrode thoroughly, preferably with demineralized or deionized water. Pick a standard that is close to the conductivity value you expect to be measuring. Calibrate the handheld to the standard. Now the handheld is calibrated and it will be your reference.

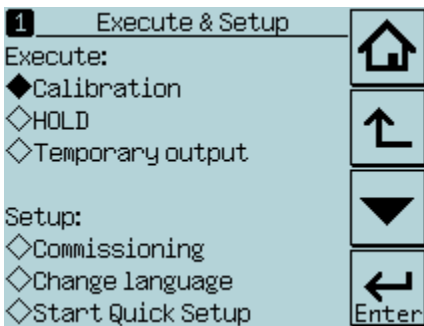
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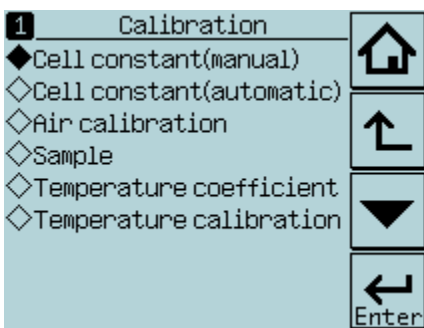
Remove the process electrode from the process. Clean it in the acid and rinse it thoroughly. Fill a container with either tap water, demineralized water or whatever clean solution is available. Place the handheld and the process sensor in the water. Wait for the temperature of each electrode to stabilize. When the readings and temperatures are stable, use the procedure below to adjust the process sensor to the handheld electrode reading.



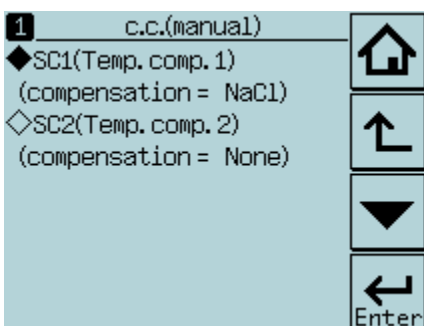
From the Main Screen, Press the Wrench



Press Enter to access the Calibration menus



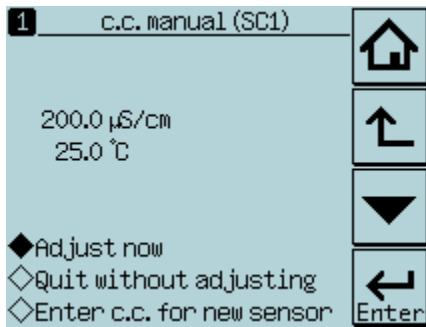
Press Enter, to select Cell Constant (manual)



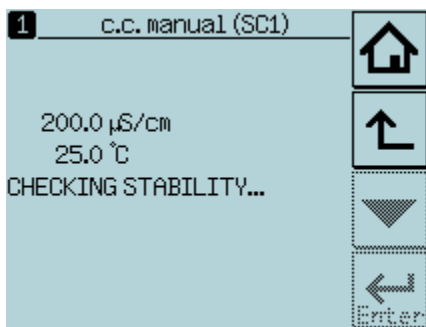
Press Enter to select SC1 (Temp. comp. 1)

Best Practice

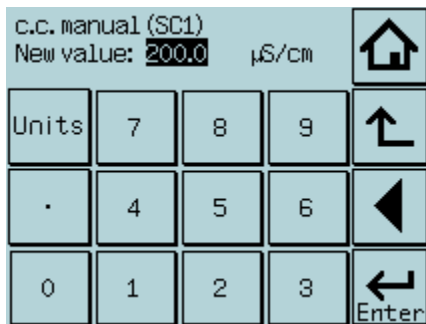
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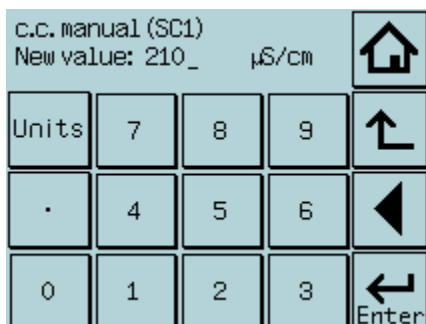
The screen will show the current Conductivity Reading (which should be close to the handheld reading.) Press Enter.



The screen will show Checking Stability. When the reading is stable the screen below will appear.



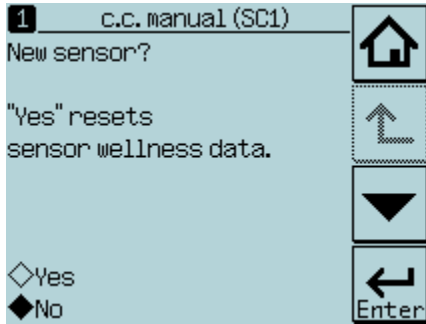
Using the keypad, adjust the reading to agree with the handheld reading (for example adjust to 210 $\mu\text{S}/\text{cm}$)



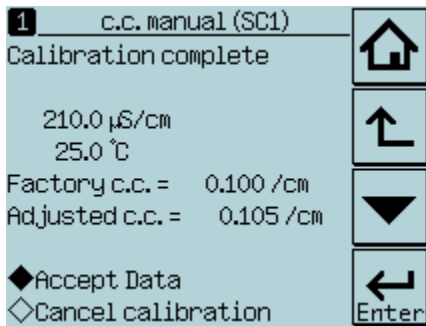
Adjust to handheld reading (i.e. 210 $\mu\text{S}/\text{cm}$)

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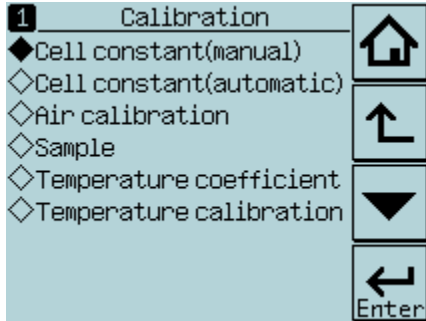
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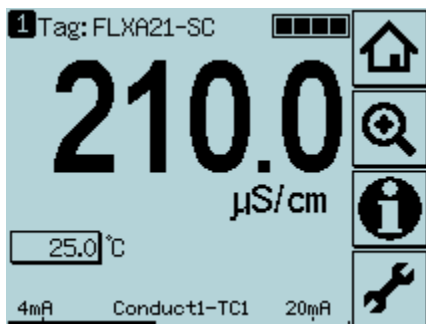
The screen will ask if it is a new sensor, highlight No and Press Enter



The screen will show the new adjusted conductivity value and the new Adjusted c.c. (Cell Constant). Press Enter



You will be back at the Calibration screen. Press the House



You are back at the home screen and the display should show the updated conductivity reading.