

# Measurement Configuration - 7082 Single Cell Conductivity

## Cell Constant

### Importance of correct cell constant

It is essential that the cell constant appropriate for the sensing cell providing input to the Analyzer/Controller be entered into the unit's database. The cell constant for a cell can be determined by checking the cell tag. Refer to the manual supplied with the cell for information about interpreting the information on the cell tag.

### ATTENTION

When in the CELL CONST mode, a cell constant update (accomplished by pressing ENTER twice) will completely initialize the instrument, removing all previously stored data from memory. Therefore, this setting should be made first in the configuration procedure.

### Procedure for entering cell constant

The procedure for entering the cell constant is provided in Table 8-2.

**Table 0-1 Procedure for Entering Cell Constant**

Step	Action
1	Press CELL CONST and the value of the cell constant currently stored in the database (0.01, 0.1, 1, 10, 25, or 50) will be displayed. Honeywell cell model numbers use the following cell constant = cell suffix designations: 0.01 = 001, 0.1 = 01, 1 = 1, 10 = 10, 25 = 25, 50 = 50.
2	Use the $\uparrow$ or $\downarrow$ keys to change the displayed value to one of these Step 1 selections. When the desired cell constant value is displayed, press ENTER. The display will flash as a warning. If you wish to exit without resetting the cell constant, press COND/RES/TEMP. To enter the displayed value of cell constant, press ENTER while the display is flashing. The instrument will store the cell constant, reset, and then return to the normal operating mode.

## Cell Calibration Factor

### Importance of correct cell calibration factor

Due to manufacturing tolerances, some variation in cell constant values of industrial conductivity cells is expected. To allow for correction of this variation, each Honeywell cell for use with Honeywell 7082 analyzers is individually tested and marked with a cell calibration factor. For highest accuracy, the calibration factor for the cell paired with the Analyzer/Controller should be entered in the unit's database.

Note that in contrast to a *cell constant* which is a number associated with a *type* of cell, the *cell calibration factor* is unique to a *particular* cell within the type. Therefore, if the cell providing input to the Analyzer/Controller is replaced, the cell calibration factor for the replacement cell should be entered in the database in place of the old cell's cal factor.

## Procedure for entering cell calibration factor

The procedure for entering the cell calibration factor is provided in Table 8-5.

**Table 0-2 Procedure for Entering Calibration Factor**

Step	Action
1	Note the cell calibration factor marked on the cell. (Refer to the manual supplied with the cell for guidance in interpreting the information on the cell tag.)
2	From normal operating mode, press CELL CONST. The value of the currently stored cell constant will appear on the display.
3	Press CELL CONST and $\uparrow$ keys simultaneously. The Cell Calibration Factor, along with SET, CAL and 1 indicators will be displayed. <i>Some instruments will display a "CAL" indicator, while others will display a leftmost decimal point instead.</i>
4	Use the $\uparrow$ or $\downarrow$ keys to adjust the value on the display to the previously noted value marked on the cell.
5	Press ENTER to store this value and to return to normal operating mode. The cell calibration factor is stored and will be included by the instrument in subsequent calculations.

### NOTE

Successful measurements depend upon selection, care and cleanliness of the conductivity cell. Always prepare cells in accordance with the instructions supplied with them, observing temperature, pressure and flow limitations. For most accurate temperature measurement and compensation, it is good practice to insulate the outer body of the cell so that process temperature measurement is less affected by ambient conditions.

## Analyzer Calibration Checks

### Change calibration values before verifying accuracy if precision resistors are used instead of cell and temperature compensator

The accuracy of conductivity and resistivity instruments is sometimes verified using precision resistors in place of the cell and temperature compensator. If this kind of test is to be made, it is first necessary to change previous calibration values.

Perform the following procedures described in 8.7 and 8.8.:

1. Set the cell calibration factor to 1.000.
2. Perform nominal calibration trim function.
3. On Wide Range Analyzers, set the lead length to zero.

Perform the tests. When tests are complete, re-enter the proper cell calibration factor and lead length, if applicable.

$$\text{Conductivity check resistance (ohms)} = \frac{\text{Cell Constant (cm}^{-1}\text{)} \times 10^6}{\text{Conductivity (microsiemens/cm)}}$$

$$\text{Resistivity check resistance (ohms)} = \text{Cell Constant (cm}^{-1}\text{)} \times \text{Resistivity (ohms-cm)}$$

$$\text{TDS check resistance (ohms)} = \frac{\text{Cell Constant (cm}^{-1}\text{)} \times 10^6}{\text{TDS (ppm)/TDS factor}}$$

In addition, an 8550-ohm resistor (Honeywell part number 233300) is installed in place of the temperature compensator to simulate 25°C, the reference temperature.