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| Station Temperature Calibration (Zeno and Sutron) Guide |
| *SOP Reference* |
| Revision Number 0  04/23/15 |

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# [Zeno Station Temperature Calibration](#Table_Of_Contents)

## [Summary of Method](#Table_Of_Contents)

The Environmental Protection Agency (EPA) suggests that the internal station temperature have a variance of ±2 Degrees Celsius (±3.6 Degrees Fahrenheit) from the set point between 20 and 30 Degrees Celsius (68 and 86 Degrees Fahrenheit). The Zeno 3200 sensor is ±1 Degree Celsius accurate (±1.8 Degrees Fahrenheit accurate).

## [Zeno Calibration Procedure](#Table_Of_Contents)

This procedure must be completed on an annual basis. The following is the list of steps to conduct this calibration procedure.

1. Bring the certified calibrator (DeltaCal) into the monitoring shelter.
2. Allow the DeltaCal to equilibrate for a minimum of 20 minutes.
3. Turn on DeltaCal
4. Plug in external DeltaCal temperature probe (thermocouple).
5. Place the certified DeltaCal NIST traceable temperature probe near the station temperature sensor, which is within the Zeno 3200 Data Logger, near the upper left corner.
6. Plug open end of the LAN cable into LAN port on Laptop.
7. Plug the other end of the LAN cable into LAN port of Kyocera Router, if not already plugged in.
8. Boot up the computer.
9. Locate ZenoCom.ht, file (i.e., on computer desktop).
10. Double-click the ZenoCom.ht icon (on open, Hyperterminal® will display in its lower left corner of window “connecting,” then “connected,” then elapsed time connected.).
11. Press *U* and *ENTER* (you will be prompted for password).
12. Enter *zeno* as the password and press *ENTER* (you will see the *USER MENU* displayed).
13. Press *F* and the *ENTER* (you will be prompted for password).
14. Enter *zeno* and press *ENTER* (you will see system functions menu).

## [Zeno Calibration Procedure (continued)](#Table_Of_Contents)

1. Press *T* and *ENTER* (you will see current station temperature in Degrees Celsius and Degrees Fahrenheit).
2. Locate temperature sensor calibration spreadsheet (i.e., on computer desktop).
3. Double-click calibration spreadsheet to open.
4. Type in the following information: Site, Date, Operator, Zeno Model # (3200), Serial Number, Temperature Standard (DeltaCal), Serial Number, and Certification Due Date. Type in the light blue cells only to fill in information.
5. Enter current Degrees Fahrenheit from Zeno in the “indicated temperature” cell in the calibration spreadsheet (Light Blue Cell).
6. Enter actual temperature from DeltaCal temperature probe in “actual temperature” cell in the calibration spreadsheet in degrees C (Light Blue Cell). On the DeltaCal screen the temperature probe will be indicated next to the letters “Tf”.
7. Once all data has been entered into the calibration spreadsheet (Light Blue Cells Only), ensure the “maximum allowable difference” is within specification (CELL C17, In Red Numbers). If it is not within the specification, check probe placement and make sure temperature is stable, then repeat steps 19 – 21.
8. On Zeno Program, enter actual temperature from DeltaCal (example 24.7 C) into the Zeno from spreadsheet and press *ENTER* (after writing data to EEPROM, the station temperature is calibrated).
9. Save the calibration spreadsheet on station jump drive and on the DAQEM Network P Drive upon returning to the office.
10. Record station temperature sensor calibration in Zeno Electronic Log.
11. Log out of Zeno, close computer, disconnect all cables.

# [Sutron Station Temperature Calibration](#Table_Of_Contents)

## [Summary of Method](#Table_Of_Contents)

The Sutron Xpert internal temperature measurement accuracy is ±3 degrees Celsius (±5.4 Degrees Fahrenheit accurate).

## [Sutron Calibration Procedure](#Table_Of_Contents)

Perform the following steps to calibrate the temperature sensor.

1. Bring the certified DeltaCal into the monitoring shelter and allow an equilibration time of 10 minutes.
2. Plug the external temperature probe into the DeltaCal and turn on the DeltaCal.
3. Place the DeltaCal temperature probe near the Sutron datalogger on the side away from the air conditioner.
4. Open the station temperature calibration spreadsheet.
5. Enter the required information in the blue cells.
6. Use the Xterm computer program to establish communication with the datalogger.
7. From the “Retrieval Access” menu, click on the “Sensor” tab and then the “ITemp” sensor indication.
8. Enter the ITemp value in the spreadsheet Indicated Temperature blue cell in degrees F.
9. Enter the DeltaCal temperature probe “Tf” indication in degrees C in the Actual Temperature blue cell in the spreadsheet.
10. Ensure the “maximum allowable difference” is within specification. For the NCore station Sutron datalogger the specification is ±5.4 Degrees Fahrenheit. That is different than the other DAQEM monitoring stations.
11. If the result is not within the specification, check probe placement and make sure temperature is stable, then repeat the measurement procedure.
12. Save the calibration spreadsheet on station USB storage device and on the DAQEM network P Drive.
13. Make an appropriate log entry on the datalogger Log tab.
14. Logout of the datalogger.