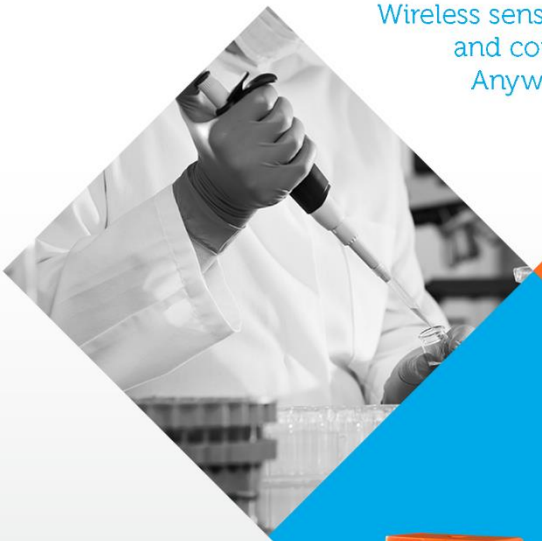
Sense Anywhere

AiroSensor long term drift explanation

Version 1.0



Wireless sensing, logging and control... Anywhere

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Document Status

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Revision History

Table 1 Revision History

Version	Date	By	Reason
1.0	20181025	Nanja Segers	Initial version

SenseAnywhere AiroSensor long term drift explanation

The AiroSensors models 20-20-2x, 20-20-3x and 20-20-4x all feature MEMS (Microelectromechanical systems) sensors. All the elements that determine a temperature or humidity are integrated on one single die in a semiconductor (chip). Silicon, the base material of which semiconductors are made is known for its stability; MEMS sensors are very stable and feature a very low long-term drift.

Our data sheet typical drift over life was compared to shifts after High Temperature Operating Life (HTOL) aging of the temperature and humidity electronic parts of our AiroSensors.

For temperature drift our best data set is at 30°C pre and post aging for 2 lots of data (146 devices). We saw 0.04°C average shift with a standard deviation of 0.022°C with values ranging from 0 to 0.122°C.

For humidity drift, this is specified as accuracy in the 30 - 50% RH range. Based on 4 lots of data (278 devices measured at 20,40 and 60% RH) we saw 0.46% shift on average with a standard deviation of 0.39% and values ranging from 0 to 1.81% worst case over this range.

This data was taken before and after 1000 hours of 125°C aging and compared. Based on our standard acceleration model, this is equivalent to 10 years of normal use. The average drift is well within the data sheet typical numbers of 0.25% RH per year and 0.01°C/year.

Notes:

Data sheet numbers are typical numbers. Actual performance can vary from device to device and based on environmental condition. Actual measurements indicate the shifts are logarithmic with time so an assumption that shifts are linear is conservative.

Drift seen in the field with humidity sensors is most of the times caused by other influences:

- Prolonged exposure to high humidity levels (above 80%) will cause gradual drift of the humidity.
- The humidity sensor is sensitive to many chemicals and fumes. Notably, household cleaning agents, such as ammonia, are known to cause sensor readings to drift. To maintain accuracy of the humidity sensor, avoid exposure to chemical fumes and contaminants.
- Bleach, hydrogen peroxide, ammonia, and other chemicals can affect or damage the sensor.