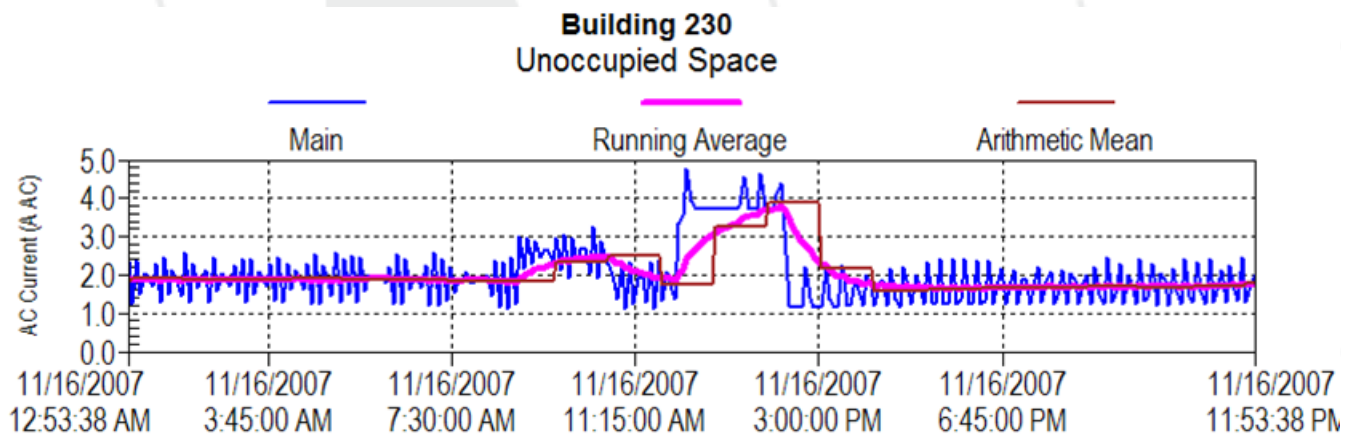


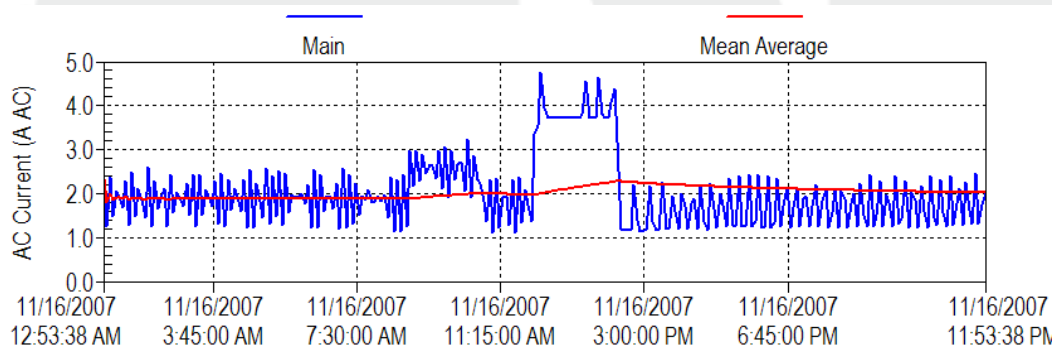
## Average Value Calculations

Calculating Average Values is easy with ACR TrendReader Software – the Compound Line function makes it simple to determine the running average or the arithmetic mean for a time interval.

Average values are often used when a signal is fluctuating such that it is hard to determine the overall picture of what is actually occurring. A running average takes into account large transgressions as it moves along the data set so every previous reading affects the latest value calculated on a weighted basis. The arithmetic mean is finite as it can be calculated on a fixed interval of data. Alternatively, the entire data set can be acted on using the sum divided by the size as Mean Average in the Statistics given for the graph in TrendReader.



In the graph above, both the Running Average and Arithmetic Mean tend to end up at the same value if there are an equal number of data points of the same relative magnitude above and below the resultant value. Within an Arithmetic averaged period, the magnitude of an excursion and its duration are delayed by the data interval sampled while in the Running Average, the lag is seen as natural rise and decay. Both methods have merit in smoothing the overall picture to eliminate anomalies and but also skew the time when actual events that have occurred.



Mean Average  
applied to entire  
data set

## Solution:

Create new Compound Line equation in TrendReader 2 – Equations->Compound Line for:

Description:  Available Parameters <<

```

1 answer1 = answer1 + source0
2 answer2 = answer2 + 1
3 answer0 = answer1 / answer2
    
```

## Solution Cont.

Likewise, create new Compound Line equation in TrendReader 2 – Equations->Compound Line for:

**Edit Equation**

Description:  Available Parameters <<

```
1 If answer1 = 0 Then answer1 = source0
2 answer1 = answer1 * 0.9 + source0 * 0.1
3 answer0 = answer1
```

In the above formula, the fraction 0.9 weights the previous result then adds the current value weighted 0.1 times – when changing the weighting factor both fractions must add up to 1.

**Edit Equation**

Description:  Available Parameters <<

```
1 If answer1 < 12 Then
2     answer1 = answer1 + 1
3     answer2 = answer2 + source0
4 Else
5     answer3 = answer2/answer1
6     answer1 = 0
7     answer2 = 0
8 End If
9 answer0 = answer3
```

In the above formula, the number 12 represents the number of data points averaged which at a 5 min (300 second) sample interval multiplies out to 60 min (1 hour).

## Operation:

In TrendReader 2, follow these steps to apply the compound line function:

1. Backup data logger... Graph appears
2. Select from pull down menu Graph->Compound Lines->Add Compound Line...
3. Select Average Equation from pull down list and type <caption> in Line Name
4. Choose the temperature channel <OK>

Compound Line Equation:

Line Name:

Type in a constant number or assign a graph line to each SOURCE variable: