



## TEMPERATURE ACCURACY REPORT

### **Included in this Report:**

Results from 3 temperature accuracy studies are included in this report:

1. Typical Environmental Temperatures (120F to Room Temperature)
2. High Temperature Range (212F to 115F)
3. Cold Temperature Range (-60C to Room Temperature)

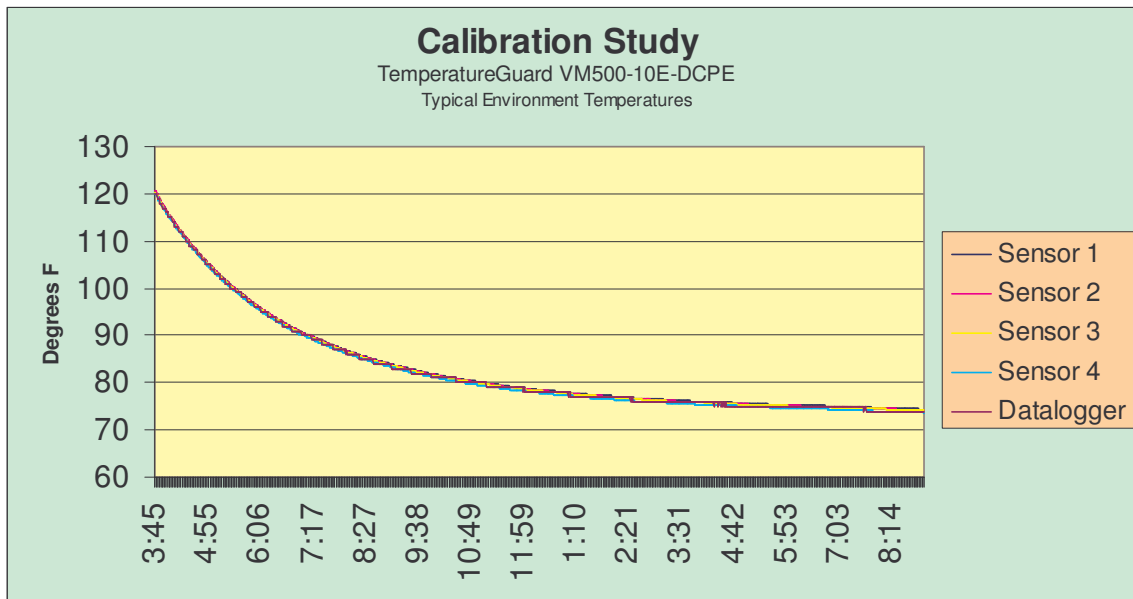
These studies conclude that the units perform well within published specifications. Additionally, the datalogger calibration verification study at 0C (32F) and 100C (212F) is also included at the end of this report.

### **CONDITIONS:**

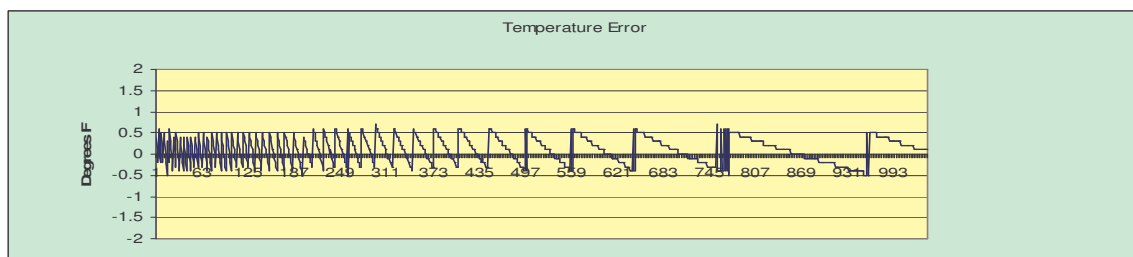
The following studies were conducted with TemperatureGuard units obtained from stock in the “as calibrated and ready to ship” mode. A Tenney Jr. environmental chamber was used for heating and cooling the environment, an Omega OM-EL-USB-TC Datalogger was used as the temperature reference. Temperature probes (ACI/1K-2W-BP Bullet probe) were positioned mid-chamber in free air in close proximity to each other.

## Typical Environmental Temperatures (120F to Room Temperature)

This study was conducted with a TemperatureGuard VM500-10E-DCPE unit obtained from stock in the “as calibrated and ready to ship” mode. A Tenney Jr. environmental chamber was preheated to 120F. The chamber contained 4 Temperature probes (ACI/1K-2W-BP Bullet probe) and an Omega OM-EL-USB-TC Datalogger temperature probe. The temperature probes were positioned mid-chamber, in free air, in close proximity to each other. The chamber was allowed to cool slowly to room temperature while temperature readings from the datalogger and the TemperatureGuard unit were recorded at 1 minute intervals. The graph below shows these readings plotted over time.



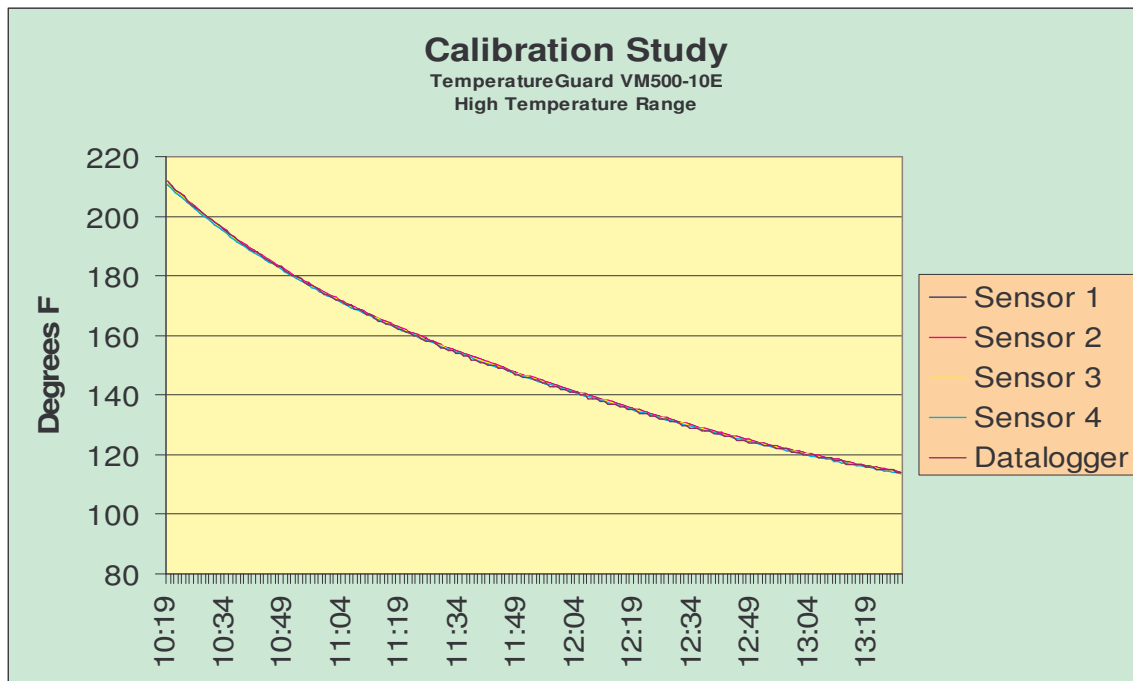
Next, the readings from one sensor were compared to the readings from the datalogger and the differences (error) plotted below.



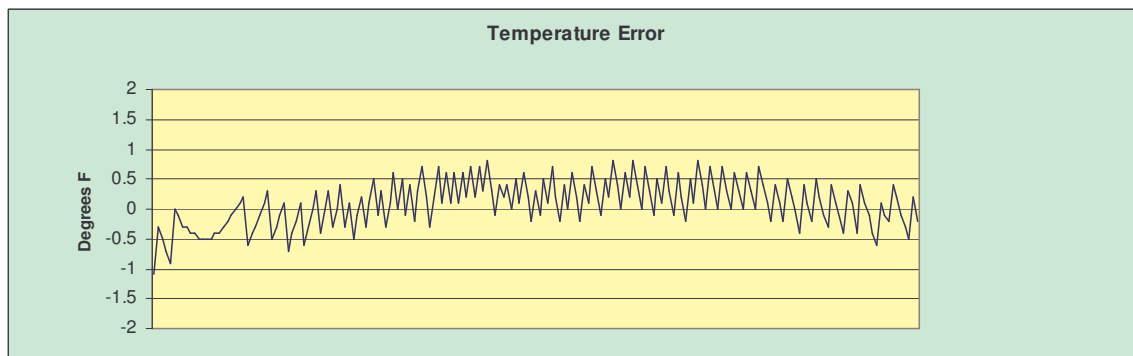
Note that the error is always less than 0.6 degrees F. The “sawtooth nature of the graph is a result of differences in the datalogger recording format and the TemperatureGuard recording format. The results are accurate.

## High Temperature Range (212F to 115F)

This study was conducted with a TemperatureGuard VM500-10E unit obtained from stock in the “as calibrated and ready to ship” mode. A Tenney Jr. environmental chamber was preheated to 215F. The chamber contained 4 Temperature probes (ACI/1K-2W-BP Bullet probe) and an Omega OM-EL-USB-TC Datalogger temperature probe. The temperature probes were positioned mid-chamber, in free air, in close proximity to each other. The chamber was allowed to cool slowly to 115F while temperature readings from the datalogger and the TemperatureGuard unit were recorded at 1 minute intervals. The graph below shows these readings plotted over time.



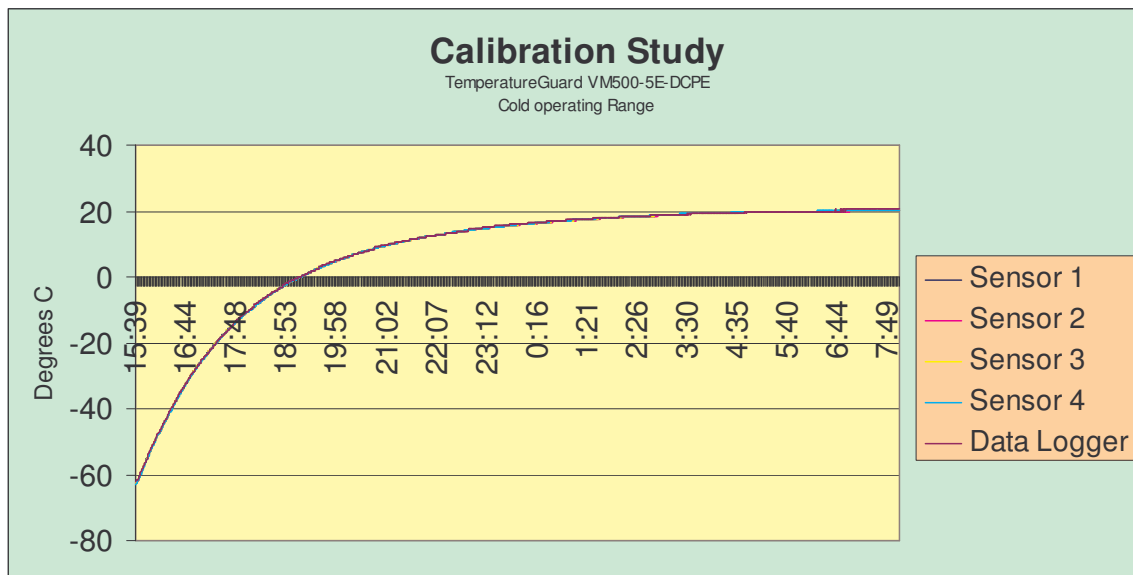
Next, the readings from one sensor were compared to the readings from the datalogger and the differences (error) plotted below.



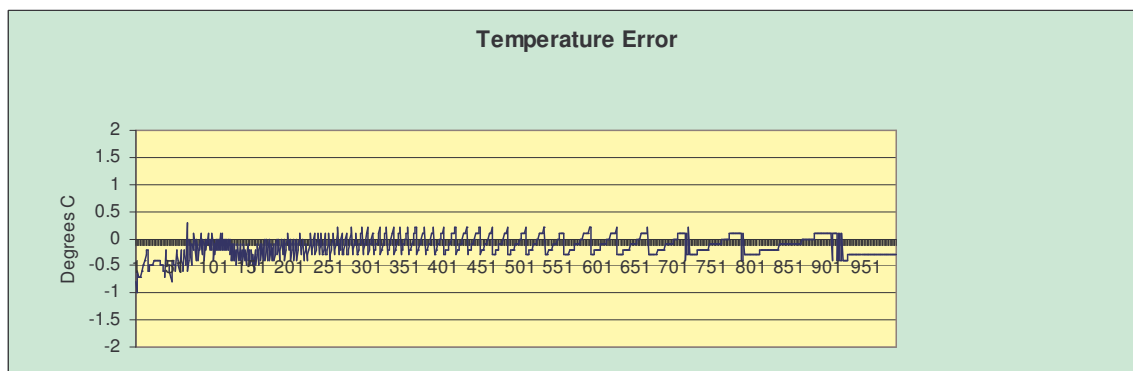
Note that the error is always less than 1 degree F. The “sawtooth nature of the graph is a result of differences in the datalogger recording format and the TemperatureGuard recording format. The results are accurate.

### Cold Temperature Range (-60C to Room Temperature)

This study was conducted with a TemperatureGuard VM500-5E-DCPE unit obtained from stock in the “as calibrated and ready to ship” mode. A Tenney Jr. environmental chamber was cooled to -60F. The chamber contained 4 Temperature probes (ACI/1K-2W-BP Bullet probe) and an Omega OM-EL-USB-TC Datalogger temperature probe. The temperature probes were positioned mid-chamber, in free air, in close proximity to each other. The chamber was allowed to warm slowly to room temperature while temperature readings from the datalogger and the TemperatureGuard unit were recorded at 1 minute intervals. The graph below shows these readings plotted over time.



Next, the readings from one sensor were compared to the readings from the datalogger and the differences (error) plotted below.



Note that the error is well under 0.5 degrees F with the exception of the area around -60F where the error remains less than 1 degree. The “sawtooth nature of the graph is a result of differences in the datalogger recording format and the TemperatureGuard recording format. The results are accurate

### Datalogger calibration verification at 0C (32F) and 100C (212F)

This study was conducted with an Omega OM-EL-USB-TC Datalogger and associated temperature probe. The temperature probe was positioned alternately in an ice bath (32F / 0C) and water at the boiling point (212F / 100C). Temperature readings from the datalogger unit were recorded at 1 minute intervals. The graph below shows these readings plotted over time. Note the calibration is correct as the Datalogger recorded 0C and 100C for the freezing and boiling points of water.

