

# Field Calibration Procedure and Certificate

## M306

### Calibration Recommendations:

In the absence of other calibration standards, methods, and recommendations for your application we recommend that the Temperature Guard unit be calibrated annually.

It is highly recommended that the unit be recalibrated if, during installation, any lead wire to the temperature sensor is added or eliminated.

### Required Equipment:

1. An NIST traceable temperature/humidity measurement standard such as a thermometer or other measuring device (referred as Standard)
2. Data Capture software running on a computer
3. Fully installed and functioning Temperature Guard system with sensors

Temperature calibration is a one point calibration and shall be performed with the temperature sensor in place.

### Preparation

1. Open Data Capture, click on Setup -> Temperature Guard Servers and Sensors
2. Select the Temperature Guard to be calibrated by left clicking on the name in the list.
3. Right click on the selected Temperature Guard and select Edit Sensors.
4. Data Capture will download and display all sensor parameters.
5. Click on the **Cal** button. Click on the CF button to show any current calibration factors.
6. Click on the Clear Calibration Factors button to set the correction factors to 0. Click OK in the popup box.

### Calibration for the external sensors

1. Locate the Standard as close to the temperature sensor being calibrated as possible. If the sensor is in a vial, unscrew the top and insert the Standard.
2. Allow the Standard and the temperature displayed by the Temperature Guard unit to normalize. (approx. 10-15 minutes)
3. Enter the temperature obtained from the Standard. (see page 4 of procedure)
4. Click on the **Store Calibration Factors** button. Data Capture will upload the calibration factors and then refresh the sensor data. The current temperature reading will now match the Standard.
5. Record the calibration results in the table on page 3 of this procedure.
6. Repeat steps 1 to 6 for the other sensor if it is in use.

### **Calibration for the internal temperature and humidity sensor.**

1. Locate the Standard as close to the unit as possible. The sensor is located to the left of the display screen behind the vents.
2. Allow the Standard and the temperature displayed by the Temperature Guard unit to normalize. (approx. 10-15 minutes)
3. Enter the temperature or relative humidity obtained from the Standard. (see page 4 of procedure)
4. Click on the **Store Calibration Factors** button. Data Capture will upload the calibration factors and then refresh the sensor data. The current temperature reading will now match the Standard.
5. Record the calibration results in the table on page 3 of this procedure.

Please note, the internal sensor has an accuracy of  $\pm 0.4^{\circ}\text{C}$  ( $\pm 0.72^{\circ}\text{F}$ ) and  $\pm 3.0\%$  RH. It is recommended you not adjust it unless your Standard has a tighter accuracy specification.

## Field Calibration Certificate

	Column 1	Column 2	Column 3	Column 4
<b>Channel</b>	<b>NIST Traceable Temperature Measuring Standard</b>	<b>Actual Reading Temp/Humidity before calibration</b>	<b>Correction Factor</b>	<b>Corrected Reading</b>
<b>1</b>				
<b>2</b>				
<b>Int. Temp</b>				
<b>Int. Humidity</b>				

Temperature Guard model number	<b>M306</b>
Temperature Guard serial number	
NIST traceable thermometer/hygrometer serial number (Note 2)	
Certified by (Signature)	
Printed Name	
Today's Date	
Due Date (one yr. from today's date)	

### Calibration Screen for M306

This screen is found in Data Capture. Setup/Temperature Guard Servers and Sensors/Edit Sensors. Click the Cal button.

The screenshot shows the 'M306 Parameters' window with a 'Temperature Calibration' section. It features a table with columns for 'Correction', 'Actual Temperature', and 'Current Reading'. The 'Actual Temperature' column has entries for 'T1', 'Not Named', 'Server Room Temp', and 'Server Room Humidity'. The 'Current Reading' column shows values like 67.0 °F, 73.8 °F, and 31 %RH. Below the table are buttons for 'Store Calibration Factors', 'Clear Calibration Factors', and 'Close'. A 'CF' button is located at the bottom left. The 'Alarm Configuration' section includes radio buttons for 'Turn on alarm relay when a sensor goes into alarm' and 'Turn off alarm relay when a sensor goes into alarm or the main power fails', as well as 'Enable Buzzer' and 'Disable Buzzer'. There are also input fields for 'Alarm reminder time delay (min)' and 'Two stage door alarm time delay (min)'. Three callout boxes provide instructions: 'Step 1' points to the 'Clear Calibration Factors' button, 'Step 2' points to the 'Actual Temperature' column, and 'Step 3' points to the 'CF' button.

Correction	Actual Temperature	Current Reading
.0	T1	67.0 °F
.0	Not Named	Sensor Open
.0	Server Room Temp	73.8 °F
.0	Server Room Humidity	31 %RH

**Step 1**  
Click Clear Calibration Factors to clear all calibration factors.

**Step 2**  
7. Enter the temperature measurement from the standard in this column for each sensor.

**Step 3**  
Click to store the correction factors to the unit.

Click the "CF" button to see the Correction values

M306 screen shot after calibrating the internal humidity sensor.

The screenshot shows the 'M306 Parameters' window. The 'Temperature Calibration' section contains a table with columns for 'Correction', 'Actual Temperature', and 'Current Reading'. The 'Server Room Humidity' row shows a correction of -4.0, an actual temperature of 28, and a current reading of 28 %RH. Below this table are buttons for 'Store Calibration Factors' and 'Clear Calibration Factors'. The 'Alarm Configuration' section includes radio buttons for 'Turn on alarm relay when a sensor goes into alarm' (selected), 'Turn off alarm relay when a sensor goes into alarm or the main power fails', 'Enable Buzzer' (selected), and 'Disable Buzzer'. There are also input fields for 'Alarm reminder time delay (min)' and 'Two stage door alarm time delay (min)', both set to 0. A callout box points to the 'Actual Temperature' field for 'Server Room Humidity' with the text: 'In this example the standard measured 28% RH. Enter the actual value in the Actual Temperature column, and then click the Store Calibration Factors button. Current reading should change to the Actual Temperature.'

### Notes

Note 1: An Ice bath procedure (see below) can be used instead of a calibrated NIST thermometer. 32.0°F or 0.0°C would be entered in Column 1.

Note 2: Please note the NIST certificate of the thermometer/hygrometer used to calibrate must not be expired. Please keep the thermometer's NIST certificate with this completed document.

**Optional: Calibrating the external sensors using an Ice Bath Procedure**

- 1) Create an ice bath by filling 600-mL beaker three-quarters full of crushed ice.
- 2) Add enough pre-cooled de-ionized water to cover the ice, but not so much water such that the ice floats.
- 3) Thoroughly stir the ice/water mixture.
- 4) Suspend the bare temperature probe in the ice bath.
- 5) Allow the temperature shown on the M306 display to stabilize for at least 10 minutes.

**Sample Chart on page 2**

	Column 1	Column 2	Column 3	Column 4
<b>Channel</b>	<b>NIST Traceable Temperature Measuring Standard</b>	<b>Temperature Reading</b>	<b>Correction</b>	<b>Corrected</b>
<b>1</b>	30.0	30.7	-.7	30.0
<b>2</b>				
<b>Int. Temp</b>				
<b>Int. Humidity</b>				

This is the NIST traceable thermometers reading.

This is what the Temperature Guard unit reads without correction.

This is the correction from the calibration page in Data Capture

Column 1 and 4 should be equal (or very close) once the “Store Calibration Factors” button is clicked.