

Field Calibration Procedure and Certificate

M307

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 Units
2. Select the Temperature Guard to be calibrated by clicking on the name of the unit 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 **Calibrate** button.
6. Click on the **Clear** button to set the correction factors to 0. Click **YES** 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 **Apply** 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 bottom/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 **Apply** 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
Channel	NIST Traceable Temperature Measuring Standard	Actual Reading Temp/Humidity before calibration	Correction Factor	Corrected Reading
1				
2				
Int. Temp				
Int. Humidity				

Temperature Guard model number	M307
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 M307

This screen is found in Data Capture. Setup/Temperature Guard Units and Right Click/Edit Sensors. Click the Calibrate button.


Type / Port	Lower Limit	Upper Limit	Time (min)	Current Reading	Actual Reading	Correction Factor
VFC Refrigerator	34.0	46.0	30	36.5		0.0
VFC Freezer	-120.0	15.0	30	-2.1		0.0
Internal Temperature Sensor	-100.0	100.0	15	1000		0.0
Internal Humidity Sensor	10	90	15	1000		0

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

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

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

M307 screen shot after calibrating External Sensor #1.

 Program Sensor Limits for Vaccine Monitor

Save Refresh Calibrate Email/Notes Help

Vaccine

Type / Port	Lower Limit	Upper Limit	Time (min)	Current Reading	Actual Reading	Correction Factor
VFC Refrigerator	34.0	46.0	30	36.1	36.1	0.8
VFC Freezer	-120.0	15.0	30			0.0
Internal Temperature Sensor	-100.0	100.0	15	1		0.0
Internal Humidity Sensor	10	90	15	1		0

Door Inputs

Freezer Door	Normally Closed	1	Cl
Refrigerator Door	Normally Closed	1	

Enable / disable the alarm buzzer? Disabled

Configure the alarm relay as: Off

Alarm reminder time delay (minutes). Enter a value from 1 to 255 minutes or disable alarm reminder.

This area is used to temperature and humidity details on performing [www.temperaturegu](#)

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In this example the standard measured 36.1F. Enter the actual value in the Actual Temperature column, and then click the Apply 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 M307 display to stabilize for at least 10 minutes.

Sample Chart on page 2

	Column 1	Column 2	Column 3	Column 4
Channel	NIST Traceable Temperature Measuring Standard	Temperature Reading	Correction	Corrected
1	36.1	35.3	+0.8	36.1
2				
Int. Temp				
Int. Humidity				

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 “Apply” button is clicked.