



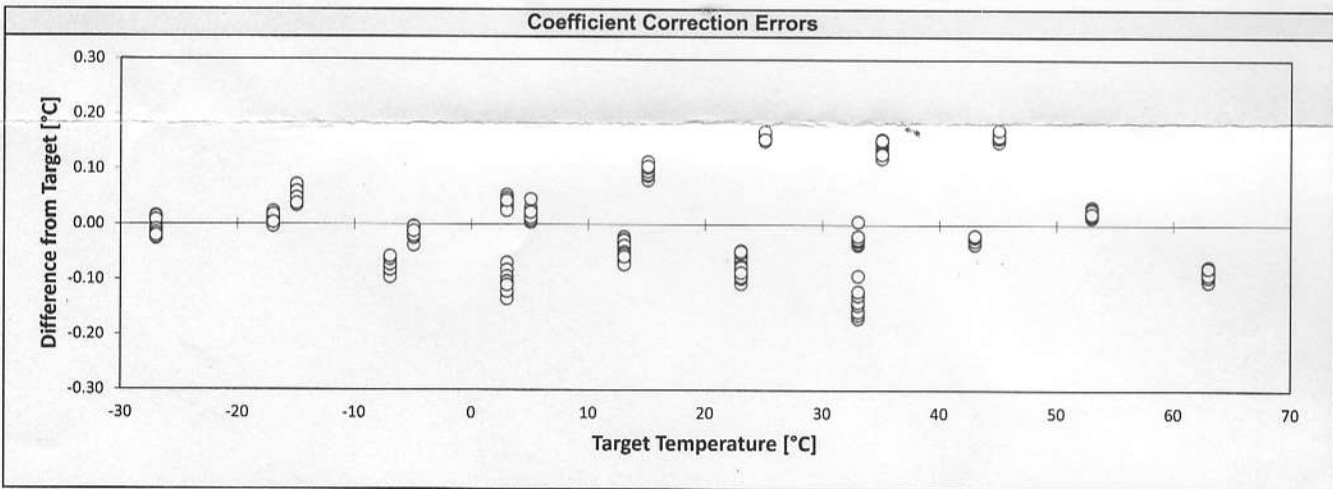
721 West 1800 North
Logan, UT 84321

Certificate of Calibration

Apogee Instruments Infrared Radiometer SI-100 Series

Calibration Overview	
Model/Serial Number	SI-131-SS_7385
Calibration Date	9-Apr-2018
Recommended Recalibration Date	8-Apr-2020
Mean of Differences from Target	0.000 °C
Target Temperature Uncertainty (95% confidence) from -30 to 65°C	0.168 °C
Maximum Difference from Target	0.173 °C
Minimum Difference from Target	-0.169 °C
Maximum Detector Response	0.468 mV
Minimum Detector Response	-0.275 mV
Average Output Sensitivity	22.932 $\mu\text{V} / ^\circ\text{C}$

Custom Calibration Coefficients			
CRBasic			
	C2	C1	C0
m	222812	23273100	3870000000
b	6696.11	-90353.6	-19674500
See the SI-100 series manual for how to apply these coefficients in determining target temperatures.			
Edlog			
	C2	C1	C0
m(SB)	2.22814	232.73333	38700.38700
b(SB)	0.06696	-0.90355	-196.74697
Use these coefficients in Edlog programs for older Campbell Scientific dataloggers.			



Calibration Procedure

An Infrared Radiometer (IRR) combines a thermopile detector and a National Institute of Standards and Technology (NIST) traceable thermistor to measure a mV response proportional to the thermal radiation balance between the target temperature and the thermopile temperature (sensor body temperature). IRRs are placed in a temperature controlled housing, which is thermally insulated from a blackbody cone. The housing, pointed at a blackbody cone, is temperature cycled through various sensor body set-points. The blackbody cone temperature (measured with NIST traceable thermistors) is likewise cycled through multiple temperature set-points relative to each sensor body temperature set-point. A linear fit is used to model each sensor body set-point with the respective blackbody cone set-points versus the thermopile signal at those set-points. The slopes and y-intercepts of all linear fits corresponding to each sensor body temperature are then fit to a second order polynomial in order to adequately interpolate between the calibrated set-points. These two sets of second order polynomial coefficients represent the custom calibration coefficients as given above.

Traceability

All thermistors are measured for accuracy in a constant temperature bath that is directly traceable to the NIST. The overall measurement system uncertainty for all the bath and measurement allowances combined for error is typically less than 0.1°C and completely traceable to National Standards.

Technical Manager : *Jacob Bingham*

Date : 09-Apr-2018

Please keep this document for your records