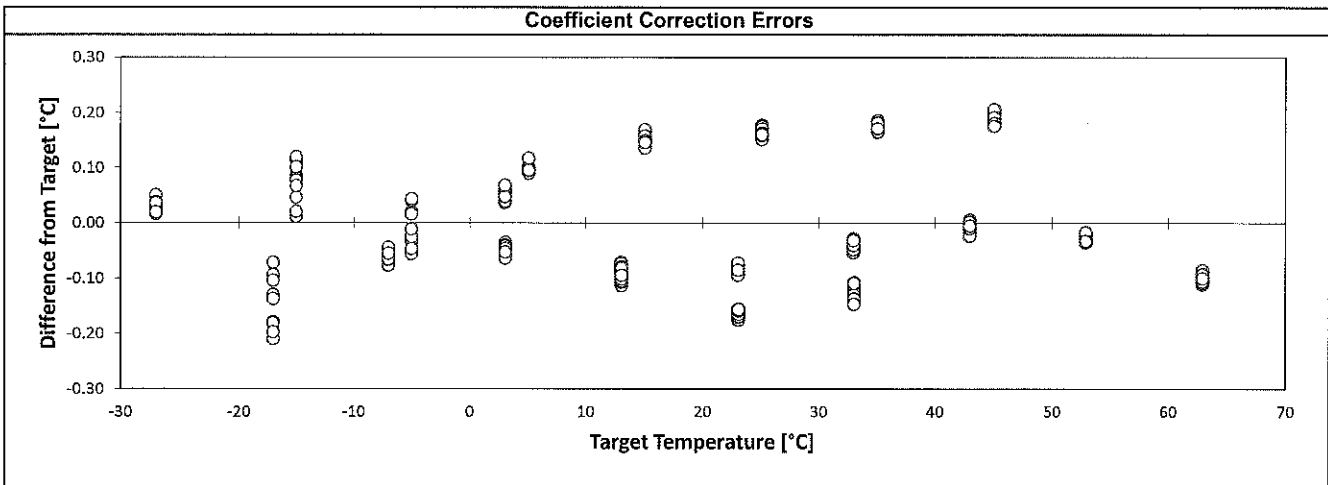


Certificate of Calibration
Apogee Instruments Infrared Radiometer
SI-100 Series

Calibration Overview	
Model/Serial Number	: SI-131-SS_7638
Calibration Date	: 1-Oct-2018
Recommended Recalibration Date	: 30-Sep-2020
Mean of Differences from Target	: -0.001 °C
Target Temperature Uncertainty (95% confidence) from -30 to 65°C	: 0.217 °C
Maximum Difference from Target	: 0.207 °C
Minimum Difference from Target	: -0.208 °C
Maximum Detector Response	: 0.422 mV
Minimum Detector Response	: -0.243 mV
Average Output Sensitivity	: 20.703 $\mu\text{V} / ^\circ\text{C}$

Custom Calibration Coefficients			
CRBasic			
	C2	C1	C0
m	281772	25649800	4266980000
b	3654.52	4137.84	-27508000
See the SI-100 series manual for how to apply these coefficients in determining target temperatures.			
Edlog			
	C2	C1	C0
m(SB)	2.81775	256.50057	42670.22670
b(SB)	0.03655	0.04138	-275.08275
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 : 01-Oct-2018

Please keep this document for your records