

Infrared Radiometers | SI-100, SIF-100, and SI-400 Series

High accuracy non-contact surface temperature measurement.



Accurate Measurements

Calibrated to a custom black-body cone with a measurement uncertainty of ± 0.2 C from -30 to 65 C when the sensor (detector) temperature is within 20 C of the surface (target) being measured. Radiometers are only sensitive from $8-14$ μm (atmospheric window) to minimize the influence of water vapor and CO_2 on the measurement.

Field of View Options

Four field of view (FOV) options, including: three circular and one horizontal aperture. Custom FOVs available upon request.

Rugged Housing

Anodized aluminum body with fully-potted electronics. The radiation shield reduces thermal fluctuations.

High Speed Options

Standard models (SI) have a response time of 0.6 seconds. New fast response models (SIF) have a 0.2 second response time.

Output Options

Analog and digital output options are available. Analog versions include un-amplified and amplified voltage outputs. Digital versions include SDI-12 and ModBus communication protocols. Sensors are also available attached to a hand-held meter with digital readout.

Typical Applications

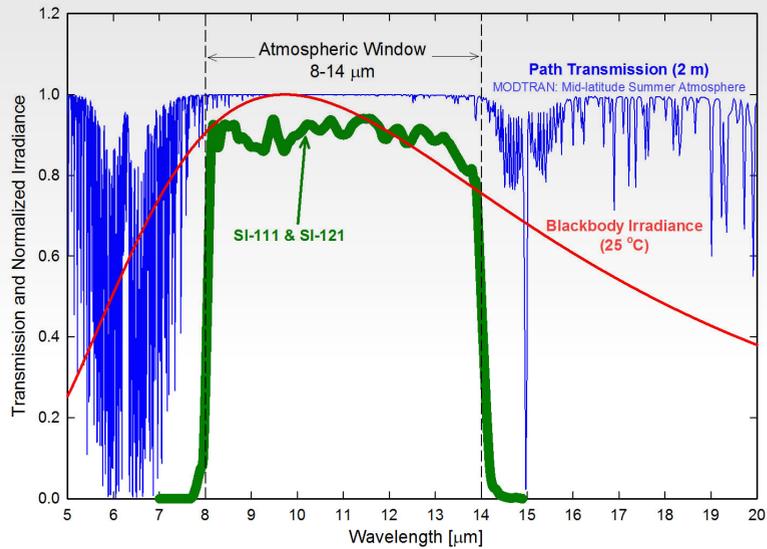
Plant canopy temperature measurement for use in plant water status estimation, road surface temperature measurement for determination of icing conditions, and terrestrial surface (soil, vegetation, water, snow) temperature measurement in energy balance studies.



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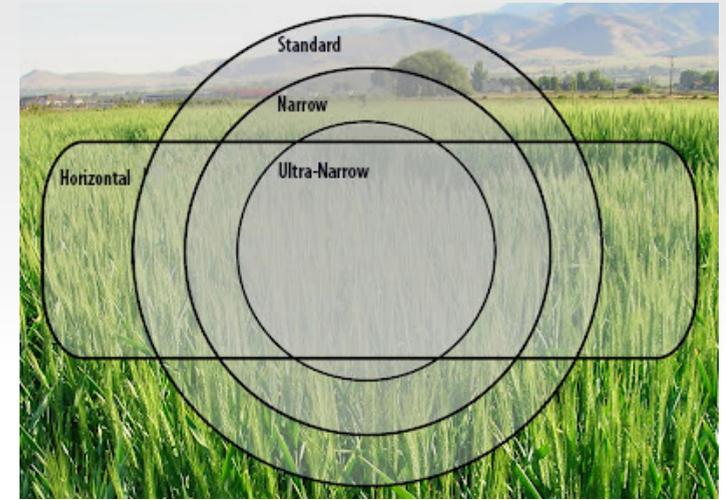
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INSTRUMENTS
Logan, UT

Spectral Response



Spectral response of SI series infrared radiometers. Spectral response (green line) is determined by the germanium filter and corresponds closely to the atmospheric window of 8 - 14 μm, minimizing interference from atmospheric absorption/emission bands (blue line) below 8 μm and above 14 μm. Typical terrestrial surfaces have temperatures that yield maximum radiation emission within the atmospheric window, as shown by the blackbody curve for a radiator at 28 C (red line).

Field of View Simulation



	SI-111	SI-121	SI-131	SI-1H1	SIF-111	SIF-121	SIF-1H1	SI-411	SI-421	SI-431	SI-4H1	
Analog Model Output (Difference between Target and Detector)	60 μV per C	40 μV per C	20 μV per C	40 μV per C	15 μV per C	10 μV per C	10 μV per C	-	-	-	-	
Input Voltage Requirement Thermistor	2500 mV excitation (typical, other voltages can be used)							-	-	-	-	
Analog Output from Thermistor	0 to 2500 mV (typical, depends on input voltage)							-	-	-	-	
Digital Input Voltage Requirement								4.5 to 24 V DC with current drain of 1.1 mA (quiescent) and 6 mA (transmitting)				
Measurement Range	-60 to 110 C *Uncertainty has been determined for the ranges below											
Calibration Uncertainty (-20 to 65 C), when target and detector ΔT are <20 C	0.2 C	0.3 C	0.2 C		0.2 C		0.2 C	0.2 C	0.3 C	0.2 C		
Calibration Uncertainty (-40 to 80 C), when target and detector ΔT are >20 C	0.5 C	0.6 C	0.5 C		0.5 C		0.5 C	0.5 C	0.6 C	0.5 C		
Measurement Repeatability	Less than 0.05 C											
Long-term Drift	Less than 2 % change in slope per year when germanium filter is maintained in clean condition											
Response Time	0.6 s, time for detector signal to reach 95 % following a step change				0.2, time for detector signal to reach 95 % following a step change			0.6 s, time for detector signal to reach 95% following a step change				
Field of View	22° half angle	18° half angle	14° half angle	32° horizontal half angle; 13° vertical half angle	22° half angle	18° half angle	32° horizontal half angle; 13° vertical half angle	22° half angle	18° half angle	14° half angle	32° horizontal half angle; 13° vertical half angle	
Spectral Range	8 to 14 μm; atmospheric window											
Operating Environment	-55 to 80 C; 0 to 100 % relative humidity (non-condensing)											
Dimensions	23 mm diameter, 60 mm length											
Cable	5 m of four conductor, shielded, twisted-pair wire; additional cable available in multiples of 5 m; santoprene rubber jacket (high water resistance, high UV stability, flexibility in clod conditions); pigtail lead wires											
Mass	190 g (with 5 m of lead wire)											
Warranty	4 years against defects in materials and workmanship											

Dimensions

