

Net Radiometers

for Measurement of the Energy Balance

The main applications for net radiometers are in agro-meteorology, in particular for the study of evapotranspiration and in climatology, meteorology and hydrology for the measurement of the radiation balance. Monitoring over glaciers and ice fields is of particular interest to global warming studies. Net radiometers are often used in conjunction with a small automatic weather station and need to be easily portable.



One-component and four-component instrument



Reliable all-weather performance



Light weight and robust



Unique ventilation system

NR Lite2 is a single-component net radiometer widely used in agriculture and hydrology. The thermopile detector is fitted with black PTFE coated conical absorbers on both sides that have a very wide spectral response from the ultraviolet (UV) to the far infrared (FIR). The signal output is the difference between the sun and sky radiation and the ground radiation and can be positive or negative, depending upon the conditions.

CNR 4 is a four-component net radiometer for accurate and reliable measurements and can be used as the reference instrument for a network of lower performance net radiometers. There are four separate signal outputs and the integrated temperature sensors can be used to calculate the FIR radiation. The screw-in mounting rod, bubble level, and cables with waterproof connectors, make installation easy. The white sun shield reduces solar heating of the instrument body.

Specifications

	NR Lite2	CNR 4
Number of signal outputs	1 - net total radiation	4 - incoming and reflected short-wave radiation downward and upward long-wave radiation
Pyrometer temperature sensors	N/A	10 K thermistor and PT100
Response time (95 %)	< 60 s	< 18 s
Non-linearity (over full range)	< 1 %	< 1 %
Temperature dependence of sensitivity	-0.1 % / °C (typical)	< 5 % from -10 °C to +40 °C
Sensitivity	10 $\mu\text{V}/\text{W}/\text{m}^2$ (nominal)	7 to 20 $\mu\text{V}/\text{W}/\text{m}^2$ short-wave 5 to 10 $\mu\text{V}/\text{W}/\text{m}^2$ long-wave
Operating temperature	-40 °C to +80 °C	-40 °C to +80 °C
Spectral range (50 % points)	200 nm to 100 μm	300 to 2800 nm short-wave 4.5 to 42 μm long-wave
Field of view	180° upper and lower sensor	180 ° short-wave upper sensor 170 ° short-wave lower sensor 180 ° long-wave upper sensor 150 ° long-wave lower sensor
Mounting rod	fixed, 800 mm long x 20 mm \emptyset	screw-in, 350 mm long x 16 mm \emptyset
Standard cable	15 m fixed cable	10 m with connector
Cable length options	N/A	25 m, 50 m
Weight with rod (excluding cable(s))	490 g	850 g