

**NR01**

4-Component Net Radiometer



# Research Grade

**Robust—4-way radiometer which requires little maintenance**

## Overview

The NR01\* is a research-grade net radiometer that measures the energy balance between incoming short-wave and long-wave infrared radiation versus surface-reflected short-wave and outgoing

long-wave infrared radiation. Our dataloggers measure the NR01's output and control its internal heater. This net radiometer offers a professional solution for scientific-grade energy balance studies.

## Benefits and Features

- › Internal resistive temperature detector (RTD) provides temperature compensation of measurements
- › Research-grade performance
- › Internal 1 W heater reduces formation of dew and melts frost
- › Separate outputs of short wave and long wave infrared radiation for better accuracy and more thorough quality assurance
- › Robust—only requiring limited maintenance
- › Connects directly to our CR6 and CR3000 dataloggers

## Technical Description

The NR01 consists of a pyranometer and pyrgeometer pair that faces upward and a complementary pair that faces downward. The pyranometers and pyrgeometers measure short-wave and far infrared radiation, respectively.

The NR01 includes an onboard RTD to measure the radiometer's internal temperature and a 1 W heater that minimizes the forma-

tion of dew and melts frost. To reduce current drain, a relay is typically used to turn on the heater only when the solar radiation is less than  $20 \text{ W m}^{-2}$ .

Campbell Scientific's CR6 and CR3000 dataloggers can directly measure this radiometer. A CR1000 can also be used, but a 4WPB100 module is required to measure the internal RTD.

*\*The NR01 is manufactured by Huksenflux but cabled for use with Campbell Scientific dataloggers.*

questions & quotes: 435.227.9080

[www.campbellsci.com/nr01](http://www.campbellsci.com/nr01)



## Mounting

To avoid shading or reflections and to promote spatial averaging, the NR01 should be mounted at least 1.5 m above the ground or crop canopy and away from all obstructions or reflective surfaces that might adversely effect the measurement. Campbell Scientific

recommends mounting the NR01 to a CM300-series mounting pole at least 25 feet away from other mounting structures. The NR01 is attached to the CM300-series mounting pole via a CM204 or CM206 crossarm.

## Ordering Information

### Research-grade Net Radiometer

**NR01-L** Hukseflux 4-Component Net Radiation Sensor with user-specified cable length. Enter the cable length in feet after the -L. Recommended length is 50, 75, or 100 ft. Must choose a cable termination option (see below).

### Cable Termination Options (choose one)

- PT** Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW** Cable terminates in a connector for attachment to a prewired enclosure.

### PRT Bridge Module

**4WPB100** 100  $\Omega$  4-Wire PRT Bridge Module for interfacing the NR01's RTD with a datalogger that does not have a current excitation channel.

## Specifications

- Sensor: Hukseflux's SR01 ISO-class, thermopile pyranometer, IR01 pyrgeometer, PT100 RTD
- Pyranometer Spectral Response: 305 to 2800 nm
- Pyrgeometer Spectral Response: 4500 to 50,000 nm
- Response Time: 18 s
- Sensitivity Range: 10 to 40  $\mu\text{V W}^{-1} \text{ m}^2$
- Expected Output Range: -0.1 to +50 mV
- Expected Accuracy for Daily Totals:  $\pm 10\%$
- Heater: 90  $\Omega$ , 1.6 W at 12 Vdc
- Operating Temperature Range: -40° to 80°C
- Dimensions: 26.3 x 11.3 x 12.1 cm (10.4 x 4.4 x 4.8 in)
- Weight: 1.3 kg (2.9 lb) with 5 m cable; 0.9 kg (2 lb) sensor only
- Heater Current Drain: ~140 mA



**CAMPBELL  
SCIENTIFIC**

Campbell Scientific, Inc. | 815 W 1800 N | Logan, UT 84321-1784 | (435) 227-9000 | [www.campbellsci.com](http://www.campbellsci.com)  
USA | AUSTRALIA | BRAZIL | CANADA | CHINA | COSTA RICA | ENGLAND | FRANCE | GERMANY | SOUTH AFRICA | SPAIN

© 2008, 2015  
Campbell Scientific, Inc.  
April 9, 2015