



# WATER & AIR

## Using a Skye rht+ with the Campbell CR10X logger

The Skye rht+ range of relative humidity / air temperature probes consist of 1 or 2 sensor units. All except the model SKH 2072 air temperature with thermistor output require an excitation voltage between 5 and 15 volts D.C.

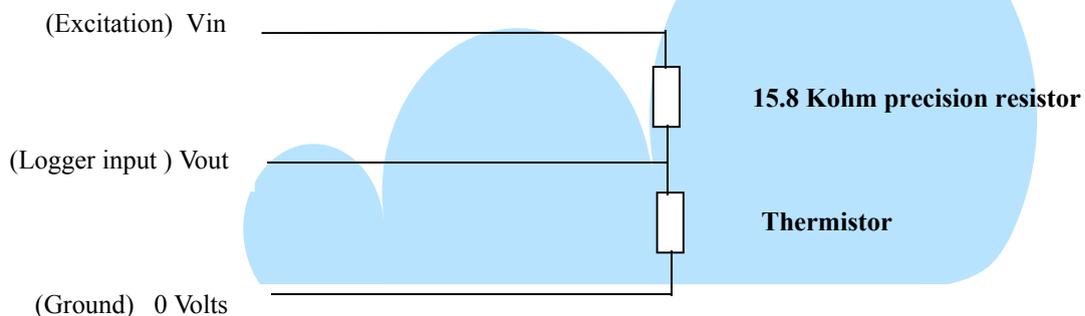
There are two methods for obtaining a 5V excitation voltage from the Campbell CR10X logger:

1. If there is a non exhaustive power supply present, e.g. mains transformer or large solar panel charged battery, then the rht+ probe can be permanently powered using the logger's 5V output. However this is not the preferred option.
2. It is recommended to include a timed 5000 mV excitation into the logger programme.
  - a) use P4 if using a single ended voltage channel, or P8 if using a differential voltage channel.
  - b) Enter the excitation parameter as 5000 mV and the delay parameter as 100 (i.e. 1 sec.)

All Skye rht+ versions have 0-1V outputs for the RH sensor. The above will allow the voltage output from the humidity sensor to be measured. If a multiplier of 0.1 is used in the programme then the logger will output values of relative humidity. (Sensor sensitivity is 0.1 volt = 100% RH)

Temperature sensors in rht+ versions SKH 2060, 2065 and 2067 also have 0-1V outputs and require 1 second delay parameter.

The SKH 2070 and 2072 rht+ versions use a 10k thermistor as the temperature sensing element, and the output is a resistance directly from the thermistor. This can be measured with the CR10X by using the sensor in a half-bridge connection and applying a polynomial in the programming instructions. (This is instruction P55)



(continued)



# Using a Skye rht+ with the Campbell CR10X logger (cont)

V<sub>in</sub> should either be applied continuously or obtained from the datalogger. If obtained from the datalogger V<sub>in</sub> should be applied for 100 milliseconds before taking a reading. The value of V<sub>in</sub> should be 500mV. (This is done using instruction P4). This will keep the dissipation in the thermistor to less than 4 microvolts.

V<sub>out</sub> should be measured in Volts in order to keep the constants in the polynomial to suitable values. If the datalogger outputs the voltage in millivolts then a multiplier of 0.001 can be used to convert this to volts. The polynomial used when V<sub>in</sub> is 500 mV is :-

$$\text{Temp. (Deg. C.)} = 81.079 - 427.39 * V_{out} + 926.19 * V_{out}^2 - 1103.8 * V_{out}^3$$

**Note** :- V<sub>out</sub> is in Volts.

**SKYE INSTRUMENTS LTD**

**21, Ddole Enterprise Park, Llandrindod Wells, Powys, LD1 6DF, UK**

**Tel: +44(0)1597 824811 Fax: +44(0)1597 824812**

**Email: [skyemail@skyeinstruments.com](mailto:skyemail@skyeinstruments.com) Web: [www.skyeinstruments.com](http://www.skyeinstruments.com)**

