

**10162 ENCLOSURE RELATIVE HUMIDITY SENSOR
INSTRUCTION MANUAL**

REVISION: 3/01

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CAMPBELL SCIENTIFIC, INC.
RMA# _____
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Logan, Utah 84321-1784

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10162 Enclosure Humidity Sensor

1. General

The 10162 Enclosure Humidity sensor contains a Elan HM2000 series precision bulkpolymer relative humidity sensor. It is used to monitor the relative humidity inside an equipment enclosure deployed in the field.

2. Specifications

Sensor: Elan HM2000 series precision bulkpolymer

Relative Humidity Measurement Range: 0 to 100% non-condensing

RH Output Signal Range: 0 to 1.0 VDC

Accuracy at 25°C

unspecified (0 to 10% Relative Humidity)

±3% RH (10 to 90% Relative Humidity)

unspecified (90 to 100% Relative Humidity)

Typical Long Term Stability: Better than 3% RH per year

Response Time (at 25°C, 90% response): 1.5 minutes for a 30% to 90% RH step change

Operating Temperature: 0°C to +50°C

Storage Temperature: -40°C to +80°C

Probe Length: 2.6 cm (1.02 in.)

Probe Cross Section Area: 0.6 cm x 1.1 cm (0.23 in. x 0.43 in.)

Power Consumption: <0.5 mA

Supply Voltage: 5 ± 0.25 VDC

Settling Time: 3 minutes

3. Installation

Mount the 10162 inside the environmental enclosure using the mounting block and the wire tie included with the sensor (Figure 1).

NOTE

The black outer jacket of the cable is Santoprene® rubber. This compound was chosen for its resistance to temperature extremes, moisture, and UV degradation. However, this jacket will support combustion in air. It is rated as slow burning when tested according to U.L. 94 H.B. and will pass FMVSS302. Local fire codes may preclude its use inside buildings.

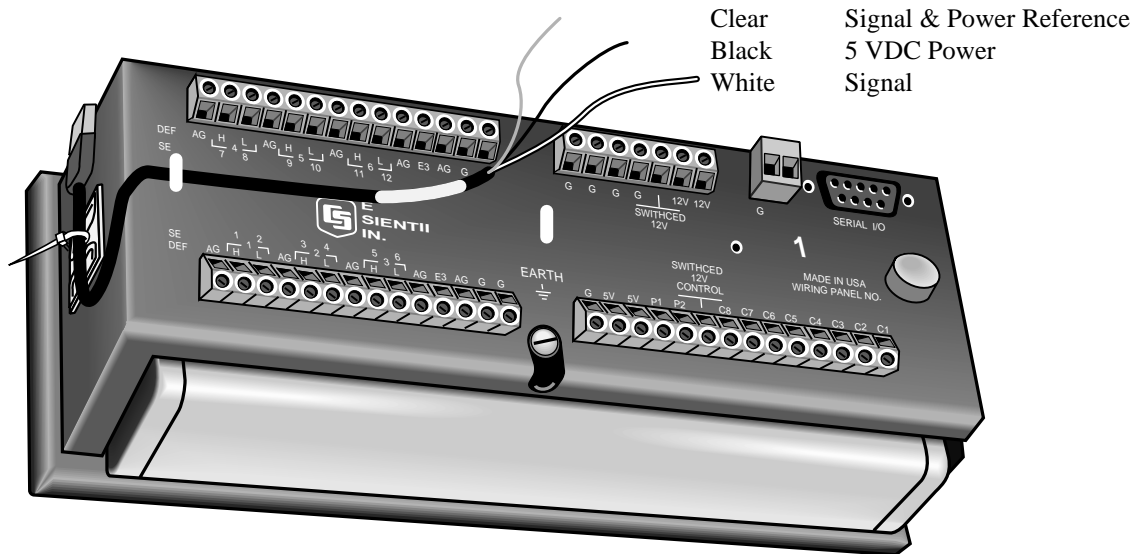


FIGURE 1. 10162 Wiring and Installation

Description	Color	CR10(X), CR500, CR23X	21X, CR7
Relative Humidity	White	Single-Ended Input	Single-Ended Input
Signal & Power Reference	Clear	G	⊥
Power	Black	5 V	Control Port

4. Wiring

Connections to Campbell Scientific dataloggers are given in Table 1. The probe is measured by a single-ended analog input channel.

5. Example Programs

This section is for users who write their own datalogger programs. A datalogger program to measure this sensor can be created using Campbell Scientific’s Short Cut Program Builder Software. You do not need to read this section to use Short Cut.

The relative humidity signal from the 10162 is measured using a single-ended analog measurement (Instruction 1).

The probe output scale is 0 to 1000 millivolts for the relative humidity range of 0 to 100%. Table 2 provides calibration information for relative humidity.

TABLE 2. Calibration for Relative Humidity

Units	Multiplier (% mV ⁻¹)	Offset (%)
Percent	0.1	0

TABLE 3. Wiring for Example 1

Description	Color	CR10(X)
Relative Humidity	White	SE 6 (3L)
Signal & Power Reference	Clear	G
Power	Black	5 VDC

Example 1. Sample CR10(X) Program

```

;Measure the 10162 relative humidity.
;
01: Volt (SE) (P1)
  1: 1      Repts
  2: 5      2500 mV Slow Range      ;CR510 (2500 mV); CR23X (1000 mV)
  3: 6      SE Channel              ;White wire (SE 6), Clear wire (G)
  4: 3      Loc [ RH_enc  ]
  5: .1     Mult
  6: 0     Offset

```

TABLE 4. Wiring for Example 2

Description	Color	21X
Relative Humidity	White	SE 9 (5H)
Signal & Power Reference	Clear	GND
Power	Black	C1

Example 2. Sample 21X Program

```

;Turn the 10162 probe on and leave it on.
;
01: Do (P86)
  1: 41      Set Port 1 High      ;Black wire (C1)

;Measure the 10162 relative humidity.
;
02: Volt (SE) (P1)
  1: 1      Repts
  2: 5      5000 mV Slow Range    ;CR10(X), CR510 (2500 mV); CR23X
                                   (1000 mV); CR7 (1500 mV)
  3: 9      SE Channel            ;White wire (SE 9), Clear wire (GND)
  4: 1      Loc [ RH_enc  ]
  5: .1     Mult
  6: 0     Offset

```

6. Enclosure Humidity

Change the enclosure desiccant packs (model number DSC 20/4) when the enclosure relative humidity exceeds 35%.

Campbell Scientific recommends that all cable entry ports, that do not use a sealed bulkhead connector, be sealed with plumbers putty and that desiccant packs be placed inside the enclosure. Spikes in the enclosure humidity are a result of opening the enclosure door and allowing ambient air inside the enclosure. The enclosure relative humidity will return its nominal values (values before the enclosure door was opened) in approximately three to four hours.

7. Maintenance

The 10162 does not have any user serviceable parts nor does it require any routine maintenance.

Replace the 10162 probe every three to five years of continuous use. If the probe fails, replace it with a new one.