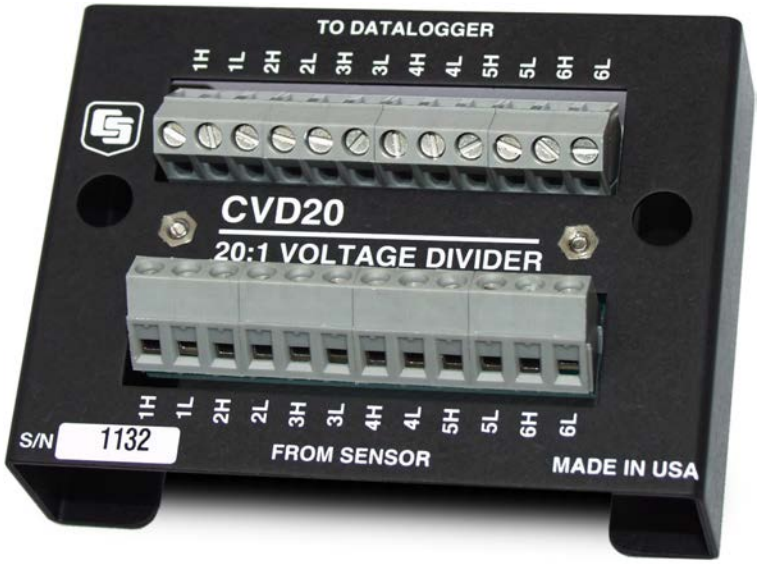
INSTRUCTION MANUAL

CVD20 20:1 Voltage Divider

Revision: 5/12



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This equipment is warranted by CAMPBELL SCIENTIFIC (CANADA) CORP. (“CSC”) to be free from defects in materials and workmanship under normal use and service for **twelve (12) months** from date of shipment unless specified otherwise. ***** **Batteries are not warranted.** ***** CSC's obligation under this warranty is limited to repairing or replacing (at CSC's option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CSC. CSC will return such products by surface carrier prepaid. This warranty shall not apply to any CSC products which have been subjected to modification, misuse, neglect, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. CSC is not liable for special, indirect, incidental, or consequential damages.

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PLEASE READ FIRST

About this manual

Please note that this manual was originally produced by Campbell Scientific Inc. (CSI) primarily for the US market. Some spellings, weights and measures may reflect this origin.

Some useful conversion factors:

Area:	1 in^2 (square inch) = 645 mm^2
Length:	1 in. (inch) = 25.4 mm 1 ft (foot) = 304.8 mm 1 yard = 0.914 m 1 mile = 1.609 km
Mass:	1 oz. (ounce) = 28.35 g 1 lb (pound weight) = 0.454 kg
Pressure:	1 psi (lb/in2) = 68.95 mb
Volume:	1 US gallon = 3.785 litres

In addition, part ordering numbers may vary. For example, the CABLE5CBL is a CSI part number and known as a FIN5COND at Campbell Scientific Canada (CSC). CSC Technical Support will be pleased to assist with any questions.

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CVD20 20:1 Voltage Divider

1. Introduction

The CVD20 provides six single-ended or six differential channels for connecting sensors that have a higher voltage output than what a datalogger can measure. Resistors in the CVD20 divide the sensor's signal voltage by a factor of 20.

2. Cautionary Statements

The CVD20 is rugged, but it should be handled as a precision scientific instrument.

3. Initial Inspection

Upon receipt of the CVD20, inspect the packaging and contents for damage. File damage claims with the shipping company.

4. Specifications

Compatibility:	CR800, CR850, CR1000, CR3000, CR5000, CR9000(X), CR7, CR10(X), CR23X, 21X.
Number of Channels:	6 single-ended or 6 differential
Division Ratio:	20:1
Resistors:	1 kohm and 19 kohm
Ratio Tolerance (@ 25°C):	±0.1%
Weight:	91 g (3 oz)
Dimensions:	9.4 x 6.9 x 3.8 cm (3.7 x 2.7 x 1.5 in.)
Temperature Coefficient:	10 ppm/°C from -20° to +85°C

5. Installation

5.1 Mounting

The base of the voltage divider has keyed slots for two screws. The slots are spaced for mounting the prepunched holes on the back plate of a Campbell Scientific enclosure.

5.2 Wiring

Figures 1 and 2 show the wiring for single-ended and differential measurements, respectively. The CVD20 connects to the sensor via the sensor's cable. The cable used to connect the CVD20 to the datalogger depends on the number of single-ended or differential channels used (see Table

1). A two-foot length should be sufficient if the datalogger and CVD20 are housed in the same enclosure.

TABLE 1. Recommended Cables for Datalogger Connection

Number of Single-ended or Differential Channels Connected	Recommended Cable(s)
1	(1) CABLE2CBL-L
2	(1) CABLE4CBL-L
3	(1) CABLE2CBL-L and (1) CABLE4CBL-L
4	(2) CABLE4CBL-L
5	(1) CABLE2CBL-L and (2) CABLE4CBL-L
6	(3) CABLE4CBL-L

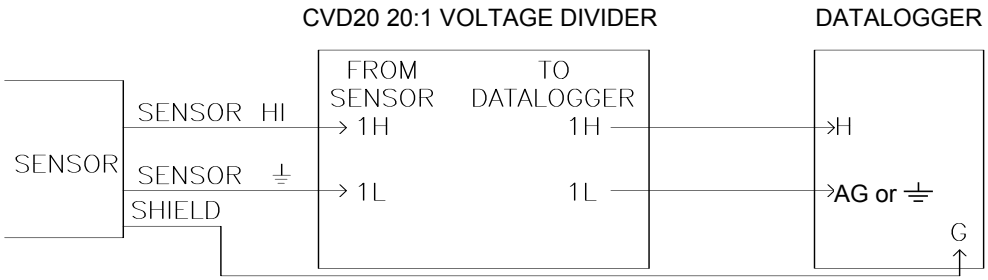

FIGURE 1. Single-ended measurement

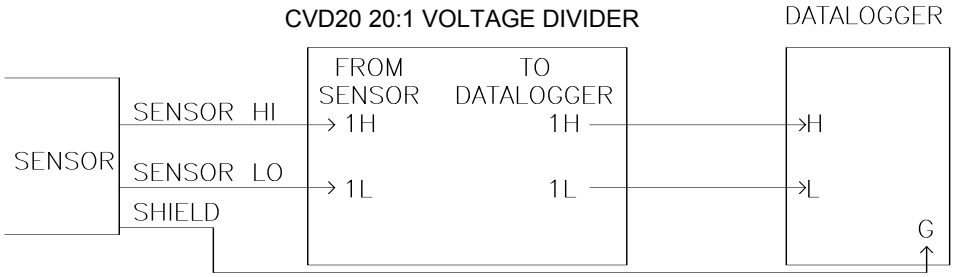

FIGURE 2. Differential measurement

6. Programming

The output of the voltage divider can be measured with a differential voltage instruction (**VoltDiff()** in CRBasic or Instruction 2 (P2) in Edlog) or a single-ended voltage instruction (**VoltSe()** in CRBasic or Instruction 1 (P1) in Edlog). Select the smallest input voltage range that will accommodate the maximum expected output. The smallest possible range will provide the best resolution.

The multiplier to use with the voltage measurement must take into account the divisor, the calibration of the sensor, and the units desired for the result.

6.1 Examples

Suppose the user wants to measure a sensor with a 0 to 5 V output. Using the CVD20 20:1 voltage divider, the 5 volt output will be divided to 5/20 = 0.25 V or 250 mV. Thus the voltage range on which to make the measurement is the ±250 mV range for the CR800, CR850, CR1000, and CR10(X) and the ±1000 mV range on the CR3000 and CR5000.

The CVD20 divides the voltage by 20 and the datalogger reads it as millivolts (i.e., (V/20) x 10^3 = V x 50). Therefore, to output directly in volts, use a multiplier of 1/50 or 0.02.

The following examples show the measurement instruction for each of the different dataloggers to measure the sensor described above.

6.1.1 CR1000, CR800, CR850

```
Public SensVolt
VoltDiff (SensVolt,1,mV250,1,True,0,250,0.02,0)
```

6.1.2 CR3000, CR5000

```
Public  SensVolt
VoltDiff (SensVolt,1,mV1000,1,True,0,250,0.02,0)
```

6.1.3 CR10(X)

```
1: Volt (Diff) (P2)
  1:  1          Reps
  2:  24         ± 250 mV 60 Hz Rejection Range
  3:  1          DIFF Channel
  4:  1          Loc [SensVolt]
  5:  0.02       Mult
  6:  0          Offset
```

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