INSTRUCTION MANUAL

VDIV10.1, VDIV2.1 Voltage Divider Terminal Input Modules

Revision: 5/07

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VDIV10.1, VDIV2.1 Voltage Divider Terminal Input Modules

1. Function

Terminal input modules connect directly to the datalogger's input terminals to provide completion resistors for resistive bridge measurements, voltage dividers, and precision current shunts. Voltage dividers are used to divide a voltage to provide a reduced voltage output that is a fraction of the original voltage. The VDIV10.1 is a 10:1 voltage divider, the output voltage is one tenth the input voltage, and allows a voltage up to ±25 volts to be measured on a ±2500 mV range (CR10(X)) and up to ±50 volts to be measured on a ±5000 mV range (21X, CR7, CR9000(X), CR23X, CR1000, CR800, CR850, CR3000, CR5000). The VDIV2.1 is a 2:1 voltage divider, the output voltage is one half the input voltage, and allows a voltage up to ±5 volts to be measured on a ±2500 mV range (CR10(X)) and up to ±10 volts to be measured on a ±5000 mV range (21X, CR7, CR9000(X), CR23X, CR1000, CR800, CR850, CR3000, CR5000).

Each voltage divider module may be used to measure one differential voltage or two single-ended voltages.

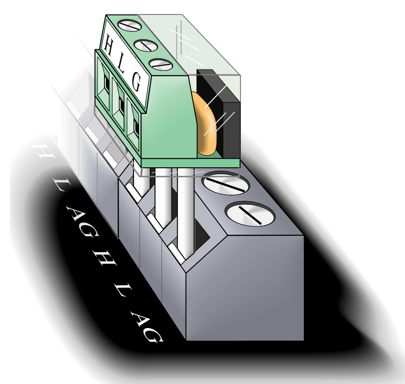

FIGURE 1-1. Terminal Input Module

2. Specifications

2.1 VDIV10.1

10:1 Resistive Divider	
Resistors	90 kΩ/10 kΩ
Ratio Tolerance @ 25 °C	±0.02%
Ratio Temperature coefficient	2 ppm/°C
Power rating	0.25 W
Maximum Input Voltage	50 volts

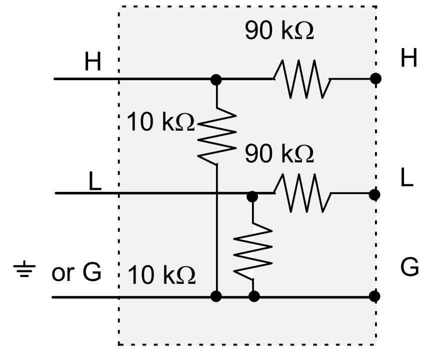

FIGURE 2-1. Voltage Divider Module Schematic

2.2 VDIV2.1

2:1 Resistive Divider	
Resistors	10 kΩ/10 kΩ
Ratio Tolerance @ 25 °C	±0.02%
Ratio Temperature coefficient	2 ppm/°C
Power rating	0.25 W
Maximum Input Voltage	10 volts

3. Wiring

Each voltage divider module may be used to measure one differential voltage (Figure 3-1) or two single-ended voltages (Figure 3-2).

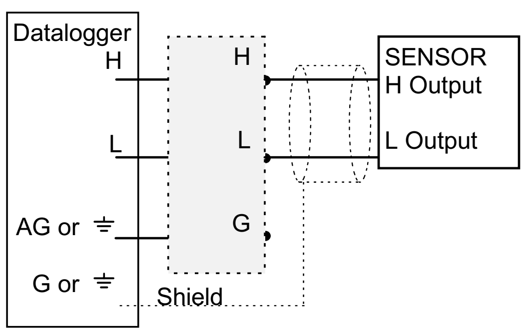

FIGURE 3-1. Wiring for Differential Voltage Measurement

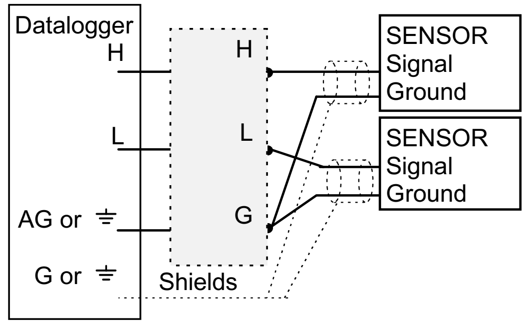

FIGURE 3-2. Wiring for Single-Ended Voltage Measurements

TABLE 3-1. VDIV10.1 or VDIV2.1 Connections to Campbell Scientific Dataloggers

Function	Label/Lead	CR10X, CR510	CR800, CR850, CR3000, CR5000, CR23X, CR1000	21X/CR7
Output High	H	1H	1H	1H
Output Low	L	1L	1L	1L
Ground	G	AG	⏚	⏚

4. Programming

The output of the voltage divider is measured with the appropriate voltage measurement instruction. A differential input is measured with the differential voltage instruction (P2 with the CR23X, CR10(X), 21X, or CR7; VoltDiff with the CR800, CR850, CR3000, CR5000, CR9000(X), CR1000). A single-ended input is measured with the single-ended voltage instruction (P1 with the CR23X, CR10(X), 21X, or CR7; VoltSE with the CR800, CR850, CR3000, CR5000, CR9000(X), CR1000). Select the smallest input voltage range that will accommodate the maximum expected output. The smallest possible range will provide the best resolution.

4.1 Example

For example, suppose we want to measure the voltage of a 12 volt battery system that may actually experience voltages in excess of 14 volts. Using the VDIV10.1 10:1 voltage divider, the 14 volt output will be divided to 14/10 = 1.4 volts or 1400 mV. Thus the voltage range on which to make the measurement is the ±2500 mV range on the CR10(X), CR800, CR850, and CR1000, the ±5000 mV range on the CR23X, 21X, CR3000, CR5000, and CR9000(X), and the ±1500 mV range on the CR7.

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. In this example, voltage is divided by 10 and read by the datalogger as millivolts (i.e., $(V/10) \times 10^3 = V \times 10^2$). To output directly in volts, we use a multiplier of 0.01.

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

4.1.1 CR1000, CR800, CR850

```
Public BattVolt
VoltDiff (BattVolt,1,mV2500,1,True ,0,250,0.01,0)
```

4.1.2 CR3000, CR5000

```
Public BattVolt
VoltDiff (BattVolt,1,mV5000,1,True ,0,250,0.01,0)
```

4.1.3 CR9000(X)

```
VoltDiff(BattVolt, 1, mV5000, 5, 1, 1, 0, 0, 0.01, 0)
```

4.1.4 CR7

```
1:  Volt (Diff) (P2)
  1:  1          Reps
  2:  7          ± 1500 mV Slow Range
  3:  1          In Card
  4:  1          DIFF Channel
  5:  1          Loc [ BattVolt  ]
  6:  0.01       Mult
  7:  0          Offset
```

4.1.5 CR10(X)

```
1:  Volt (Diff) (P2)
  1:  1          Reps
  2:  25         ± 2500 mV 60 Hz Rejection Range
  3:  1          DIFF Channel
  4:  1          Loc [ BattVolt  ]
  5:  0.01       Mult
  6:  0          Offset
```

4.1.6 CR23X

```
1:  Volt (Diff) (P2)
  1:  1          Reps
  2:  15         5000 mV, Fast Range
  3:  1          DIFF Channel
  4:  1          Loc [ BattVolt  ]
  5:  0.01       Multiplier
  6:  0          Offset
```

4.1.7 21X

```
1:  Volt (Diff) (P2)
  1:   1             Reps
  2:   5             ± 5000 mV Slow Range
  3:   1             DIFF Channel
  4:   1             Loc [ BattVolt  ]
  5:   0.01          Mult
  6:   0             Offset
```

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