

Using the CX101BG Digital Panel Meter (DPM)

The CX101BG Digital Panel Meter from Circuit Specialists is an easy to use DPM used in any system where the Power source and measured voltage share a common Ground connection. Unlike its counterpart, the CX101A, this DPM cannot be used with the Voltage divider PCB CX-ADD ON Board. This application note will provide instructions on how to use this DPM for different voltage ranges.

Like all Digital Panel Meters, the full scale range of this DPM is 200 mv full-scale. The basic connection is shown in the drawing below. If other full scale voltage ranges are desired, suitable voltage divider resistors are required. We will describe how to calculate these values and provide a table for easy reference.

To keep the calculated values within a range that is readily obtainable, we will use 10 Meg ohms as the maximum series resistor value. We can then calculate the shunt resistor for our voltage divider network using the voltage divider equation

$V_{out}/V_{in} = R_{shunt}/(R_{series} + R_{shunt})$ rearranging we can solve for the required

shunt resistor value. The results are tabulated below for full scale voltage values of 2 Volts, 20 Volts, and 200 Volts.

Use $R_{series} = 10$ Meg Ohms for all three ranges.

For 2 Volts full-scale $R_{shunt} = 1.111$ Meg ohms (Use 1.1 Meg Ohm)

For 20 Volts full-scale $R_{shunt} = 101$ K ohms (Use 100 K ohm)

For 200 Volts full-scale $R_{shunt} = 10.01$ K ohms (use 10 K ohm)

Note that the voltage value displayed on the meter can be fine-tuned by adjusting the trimmer potentiometer on the back of the DPM. Obviously if 200 mV full scale is desired, R_{shunt} would not be used and R_{series} would be replaced by a direct connection to pin7.

This application note has shown how easy it is to determine the Resistor values required to utilize the CX101BG Digital Panel Meter for various voltage ranges. The connection diagram is shown below.

Note that pins 5 & 8 are shorted together, pins 9 & 10 are shorted together, pins 2 & 6 are shorted together and connected to the COMMON Ground connection of the power supply. R_{shunt} will be connected across pins 6 & 7 and R_{series} will have one end connected to pin 7 and the other end to the signal that is being measured.