

## Using a Shunt Resistor with TPDIN-Monitor-WEB2

**Background:** Using a shunt resistor can allow you to measure very high currents using the TPDIN-Monitor-WEB2. A shunt resistor is an external high current capacity resistor that is placed in-line with the current circuit. The shunt is usually constructed of an alloy called Manganin (86% Copper, 12% Manganese, 2% Nickel) because it has a stable resistance over temperature. The TPDIN-Monitor-WEB2 measures the voltage drop across the resistor and displays the appropriate current.



A Typical High Current Shunt

1. To calibrate the TPDIN-Monitor-WEB2 for a particular shunt resistor, you need to enter the shunt resistance into the Shunt Resistor Ohms field on the System page of the web interface. The Max Current and Min Resistor Watts displayed are for information only.

**System Configuration**

Temperature:  F  C

Log Interval:  minutes

Cycle Delay:  seconds

Shunt Resistor:  Ohms    Max Current: 330A    Min Resistor Watts: 11W

2. Selecting a shunt resistor depends on how much current you need to measure. You can use the tool above to find the resistance needed to meet your Max Current requirements by changing the Shunt Resistor Ohms value until the Max Current displays your required current and then finding a shunt with the proper resistance and minimum watts value. For instance in the example above you may need to measure up to about 300A. You will need to find a shunt resistor with 0.000100 Ohms and at least 11W power capacity.
3. Another way to select a shunt is to find an available shunt with a current rating higher than your required current. Most common shunts are 75mV shunts. The TPDIN-Monitor-WEB2 shunt input is +/- 33 mV. When using a 75mV shunt you will need to de-rate for a 33mV input.
  - a. For example, a 100A 75mV shunt will only be able to display up to +/- 44A on the TPDIN-Monitor-WEB2 ( $75\text{mV}/33\text{mV} = 2.27$      $100\text{A}/2.27 = 44\text{A}$ )
  - b. Another way is to look at shunt resistance: 100A 75mV shunt , ( $E/I=\Omega$ ),  $75\text{mV}/100\text{A} = 0.00075\Omega$ . Enter the 0.00075 $\Omega$  to the System page and you will see Max Current is 44A.

**System Configuration**

Temperature:  F  C

Log Interval:  minutes

Cycle Delay:  seconds

Shunt Resistor:  Ohms    Max Current: 44A    Min Resistor Watts: 1W