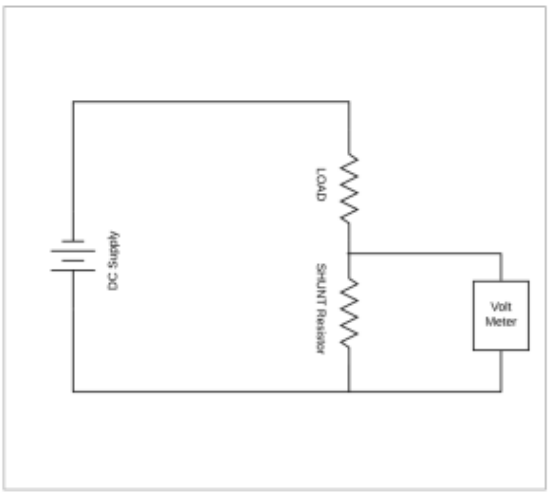
Current Measurement Using a Shunt

> *Today, practically every control and monitoring circuit uses shunt-based current measurements as an alternative to sensors. To make these measurements accurately, it is useful to understand how shunts work. Because the method is categorized as a precision measuring technology, it should not be regarded as trivial.*
>
> *A shunt is a low-value resistor used to measure current – it is therefore also referred to as a current-sense resistor. The shunt typically connects in series so it carries the current of interest. A voltage measurement device then connects in parallel with the shunt. The current through the shunt generates a voltage drop that is measured. The current value is derived from Ohm's law and the known resistance (I=V/R). To keep power loss – and thus heat development – to a minimum, shunts must have resistive values no higher than the milliohm range. Some are even below that.*



V=IR

I=V/R

Shunt Resistor:

- needs to be small such that it does not disrupt existing circuit.
- large enough to get a measurable voltage

Be careful about power rating.

$P=I^2R$

$p=10^2 \times 10$

= 1000w

Example Shunt for 12V :

Max Amp	50A
R	10
I = V(measured)/R	8v/10 = 0.8A
$P=I^2R$	$=50^2 \times 10$ =250 kw

References

Reference	URL
Measuring current with shunt resistors	https://www.powerelectronictips.com/measuring-current-shunt-resistors/