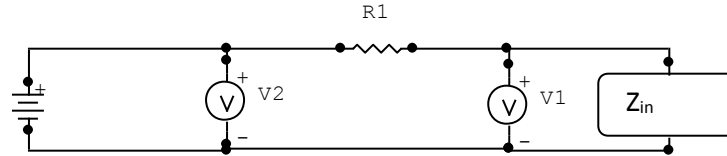


Measuring Input Impedance

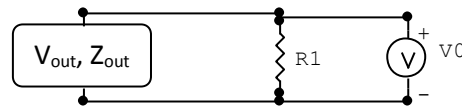
If we want to measure the input impedance of a circuit, we expect that it will be pulling only a small current. Regular current meters are not terribly good for accurately measuring small currents.



An easy way to measure small input currents is to use a fixed resistor, as in the diagram above. Measure the voltage at V1 and V2, so the input current is then $I_{in} = (V2 - V1) / R1$. The input impedance of the circuit under test is then found from $Z_{in} = V1/I_{in}$. The impedance may be frequency dependent, do the voltage source can be DC or AC, depending on which impedance you want to measure.

Measuring Output Impedance

Output impedance may also be determined using a similar technique. A fixed load resistor is used and the output voltage is measured first without the load (not pictured), then with the load (as pictured).



In the diagram above, Z_{out} is the output impedance of the circuit to be measured. If you measure the open circuit voltage V (with no load), then add the load resistor, $R1$ and the measured voltage is now $V0$ as pictured. The voltage drop across Z_{out} is $V - V0$, the output current is $I_{out} = V0/R1$, and so the output impedance is $Z_{out} = (V-V0) / (V0/R1)$.