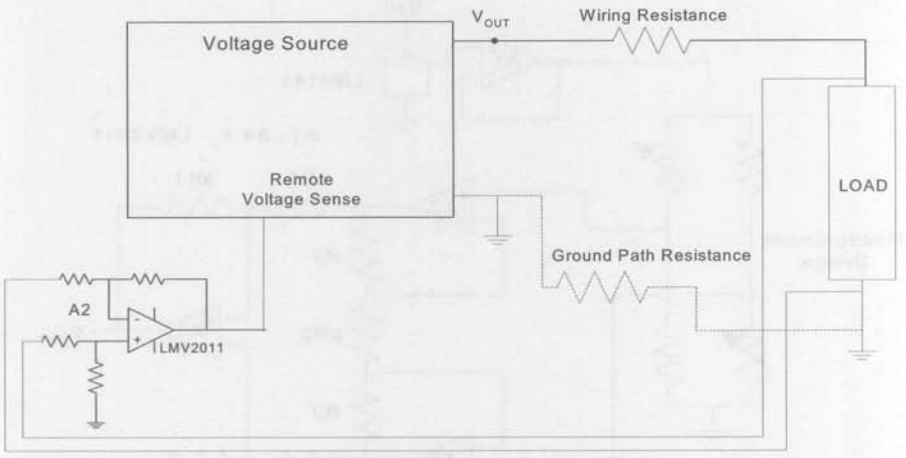
Remote Sensing Amplifier



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There are measurement and control situations in which the voltage across a load, or the current through a load, must be controlled very precisely. For example, in the previous slide the voltage is programmed in 0.025 volt steps. Continuing with the the example from the previous slide.

The load is a P4 or Athlon microprocessor requiring a current of 50 amps. In the schematic above the connection from the power supply to the microprocessor has some resistance in the path from the power power supply and there is some resistance in the ground return path. If the combined resistance in these paths is a relatively small 0.001 Ohms the voltage drop in the paths is VDROP = 0.001 x 50 = 0.050 volts. This voltage error is twice the size of the required resolution of 0.025 volts. An additional error will result when the wiring is heated by the power dissipation in it.

To compensate for the wiring losses a remote sensing amplifier is used to measure (sense) the voltage directly at the load. In the above schematic the LMV2011 is configured as a differential amplifier to feedback the actual voltage seen by the load minus any wiring voltage drops. The actual VOUT of the Voltage source is regulated to a value equal to the voltage required by the load plus the voltage drops in the wiring. In the above example, the LMV2011 with its near zero offset voltage and offset voltage drift, makes an excellent remote sensing amplifier.