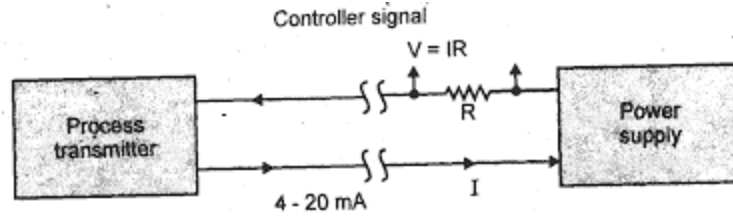


LEVEL CONVERTERS / SIGNAL CONVERTERS IN A SIGNAL CONDITIONING SYSTEM

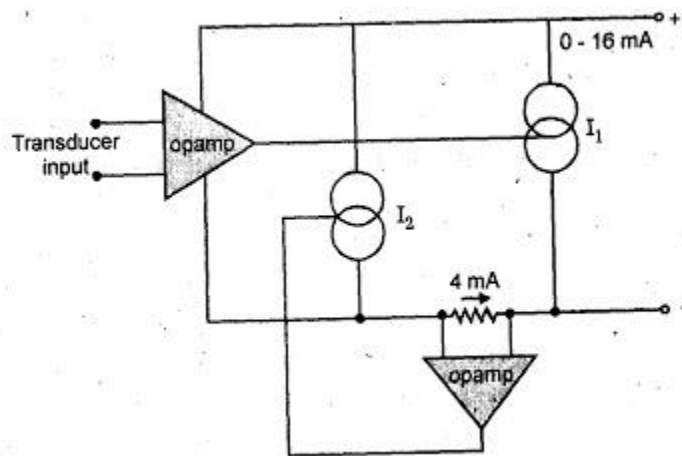
The output of the system transducer might be in one form (i.e., change in voltage or resistance change) while the readout device might require the signal in another form (e.g.: 4 to 20 mA). This requires some form of signal conditioning which will suitably alter the signal to make it compatible for interaction with subsequent system elements.

The level/signal conversion either changes the output signal of the transducer from one voltage or current level to another or from one form to another. This is frequently done for compatibility with either the transmission medium in use or the levels required by the instruments being used. In instrumentation systems, signals are frequently transmitted as a current level rather than a voltage level. Using a current level technique eliminates the effects of voltage drop. Consequently such a system requires the transducer output signals to be converted to the proper current level at the sending end (V to I converter) and back to the compatible form (I to V converter) with the instruments at the receiving end.



Voltage to current converter

A voltage to current converter for a 4-20 mA current loop. Two voltage controlled current sources are in the converter. One current source senses the power supply current for the amplifier plus the current from the voltage-controlled



current source, I_2 and sets the sum to equal 4 mA. The second voltage-controlled current I_1 provides a variable current as a function of the transducer voltage as provided by the instrumentation amplifier. This second voltage-controlled current source provides from 0 to 16 mA for a total current from 4 to 20 mA.

Current to voltage converter

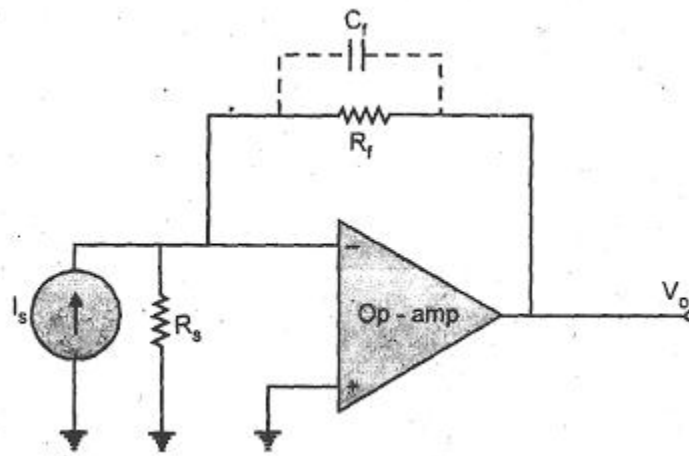


Photo diode and photo multiplexer tubes provide output current proportional to the light flux, but independent of the load impedance. An op-amp which works as current to voltage converter. Current source with shunt source resistance R is applied at the inverting terminal of the op-amp. Virtual ground at the input makes the current flow through the feedback resist R resulting in the output voltage $V_o = I_s R_f$. Often a capacitor C is placed in shunt with R to reduce the high frequency noise.

Source: <http://mediatoget.blogspot.in/2012/03/level-converters-signal-converters-in.html>