

## SOUTHREP APPLICATION NOTE

### 4-20 mA Transmitter Interface

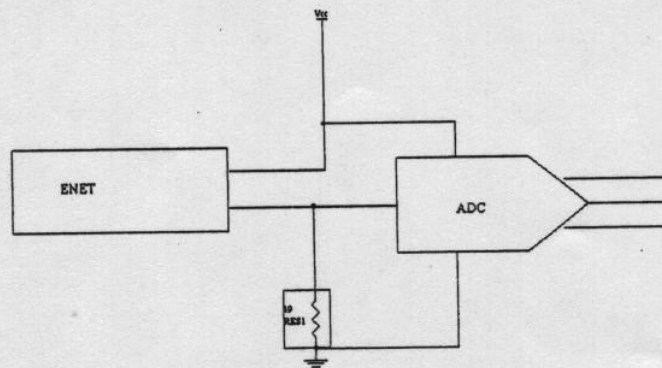
A 4-20 mA, high level signal, is considerably easier to interface to a microprocessor due to the fact that it does not require amplification, noise discrimination or linearization circuitry.

OEM's are converting to sensors that have integral 4-20 mA outputs, not only to save significant costs but, also to benefit from the obvious noise immunity of a 4-20 mA signal in many high EMI/RFI environments. They also benefit from not having to worry about distance degrading the accuracy.

There are many innovative ways that engineers have used to convert a 4-20 mA signal. Many have simply converted it to a voltage that is read by micros that have in chip ADC's. If you have a low cost micro, with no on-board ADC, a simple ADC, usually costing less than one dollar, will do the job in most applications.

Some engineers have done the design considering it as a ratiometric system. In this case all you need to complete the circuit is one op amp, 5 resistors, 2 digital pots and your ADC. This allows you to use what is typically called a 'slow' ADC with an internal reference.

Basic theory of circuit:



It should be understood that using a high level input gives your design a significant cost advantage over a low level signal that has to be linearized, amplified and noise discriminated. But, it also gives you an input that is immune to noise and one you can run a long distance without having to worry about signal accuracy.

This bulletin is for guidance only and all designs should take into account individual requirements of your circuit.

Southrep 2004 ©