

## **Temperature Sensor**

### **SCADA-TEMS**

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The temperature consists of two major parts: the temperature IC and the amplifier.

The temperature IC is an LM35. It gives an output in the range of 0 to 0.5V. This output is proportional to the temperature in degrees centigrade. 0.1 V corresponds to 1 degree Celsius.

The amplifier is a basic op amp circuit. The input goes to the non-inverting input. There is a feedback at the inverting input which determines the offset and gain adjust of the amplifier. The first one is the offset adjustment. The potentiometer varies resistance to vary the offset voltage at the output. The resistance in essence is a voltage divider of the supply. This gives an offset of around  $-10$  to  $+10$  V at the output. The other potentiometer gives the fine adjustment of the offset voltage. The  $1\text{M}\Omega$  resistor basically absorbs the voltage. Thus only a small voltage difference is reflected at the output.

The second part is the gain adjustment. The first potentiometer is 500K. This is the coarse adjustment of the gain at the output. The potentiometer has a very large value to compensate the value of  $R_i$ . The 5K potentiometer, on the other hand, determines the fine adjustment of the gain. It basically adds small increments to the resistance of the bigger potentiometer. Thus, only a small change is reflected at the output.