

ADC 0808 with LM35 temperature sensor

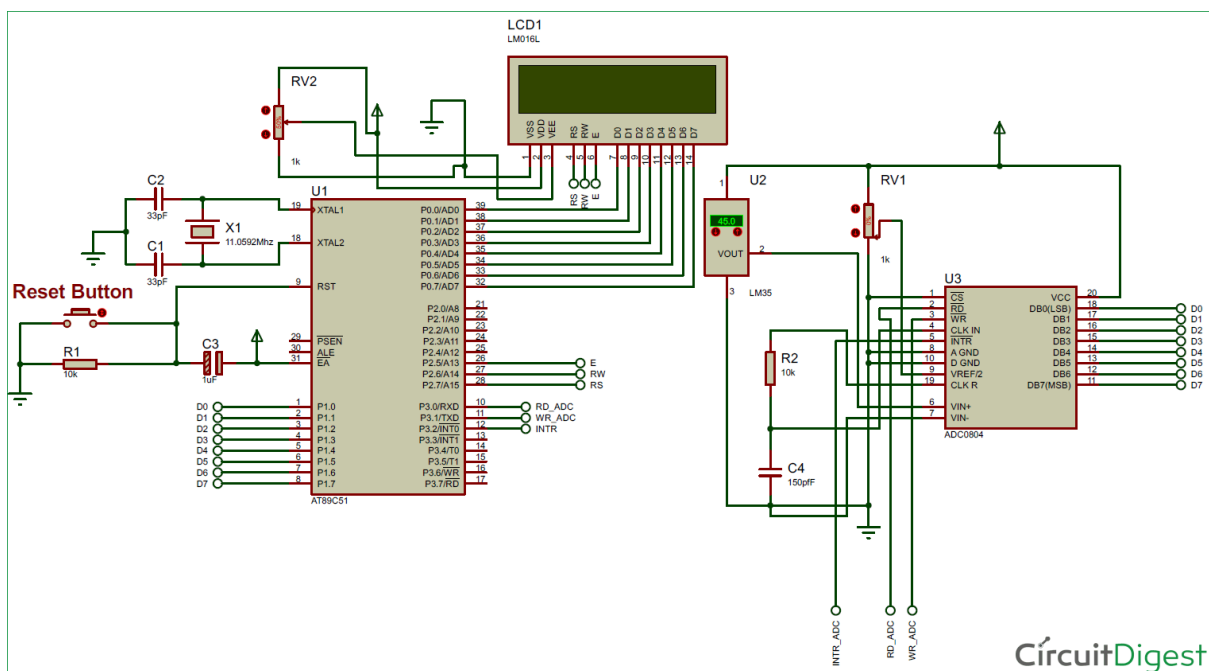
Sometimes people find it difficult to read temperature from analog thermometer because of fluctuations. So here we are going to build a simple **Digital thermometer using 8051 microcontroller** in which **LM35 sensor** is used for measuring the temperature. This topic will also serve as a proper interfacing of ADC0804 with 8051 and 16*2 LCD with 8051 microcontroller.

Components Required:

- 8051 development board
- ADC0804 board
- 16*2 LCD display
- LM35 sensor
- Potentiometer
- Jumper wires

Circuit Diagram:

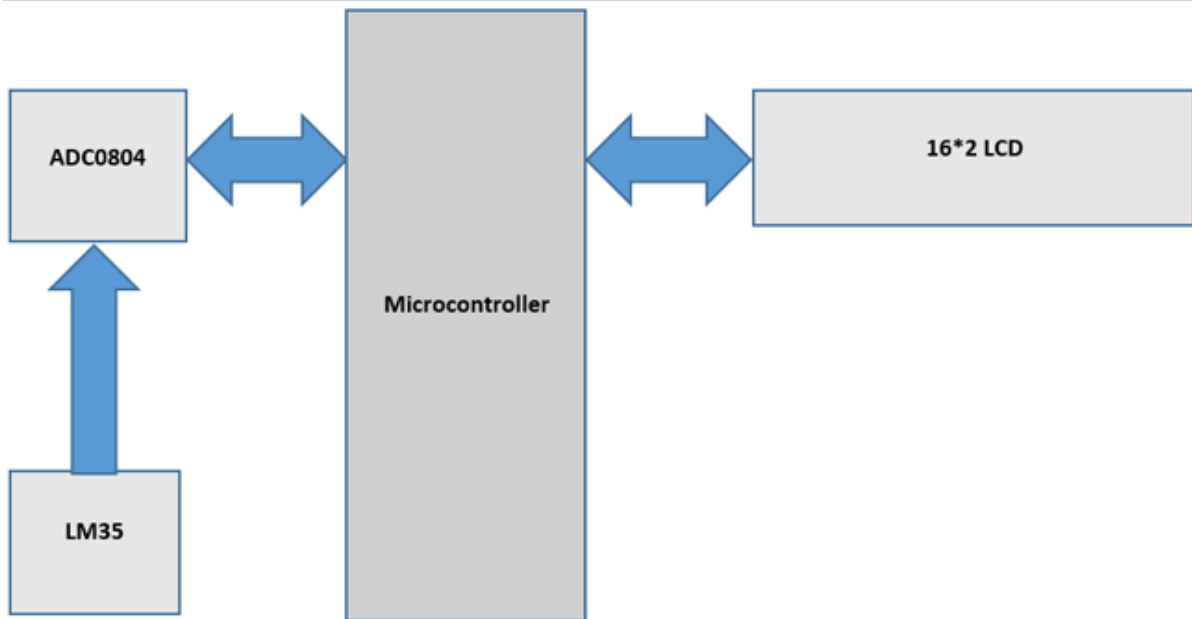
Circuit diagram for **Digital Thermometer Circuit using LM35** is given below:



Measuring Temperature with LM35 using 8051:

8051 microcontroller is a 8 bit microcontroller which has 128 bytes of on chip RAM , 4K bytes of on chip ROM, two timers, one serial port and four 8bit ports. 8052 microcontroller is an extension of microcontroller. The table below shows the comparison of 8051 family members.

Feature	8051	8052
ROM (in bytes)	4K	8K
RAM (bytes)	128	256
Timers	2	3
I/O pins	32	32
Serial port	1	1
Interrupt sources	6	8



The ADC0804 IC is an 8-bit parallel ADC in the family of the ADC0800 series from National Semiconductor. It works with +5 volts and has a resolution of 8bits. The step size and V_{in} range varies for different values of $V_{ref}/2$.

The LM35 is a temperature sensor whose output voltage is linearly proportional to Celsius temperature. The LM35 comes already calibrated hence requires no external calibration. It outputs 10mV for each degree of Celsius temperature.

LM35 sensor produces voltage corresponding to temperature. This voltage is converted to digital (0 to 256) by ADC0804 and it is fed to 8051 microcontroller. 8051 microcontroller converts this digital value into temperature in degree Celsius. Then this temperature is converted into ascii form which is suitable for displaying. This ascii values are fed to 16*2

lcd which displays the temperature on its screen. This process is repeated after specified interval.