Design, Development & Experimental Analysis of Arduino Based Current Sensing Device

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Abstract— This paper aims to design an Arduino Based Current Sensing device that senses and measures the real time flow of current through it. The proposed device uses an Arduino board, ACS712 current sensor, LCD board etc. The main features which have encouraged the design and development of Arduino based current sensing is economy, reliability, flexibility, compactness and improved performance.

Keywords: Arduino, ACS712 Current Sensor, Current Sensing Device, LCD board

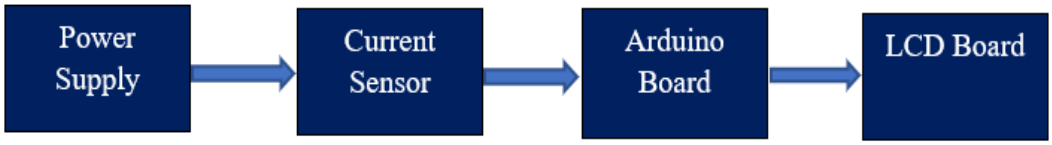
I. INTRODUCTION

ACS712 is a Hall effect based linear current sensor that can measure both direct current and alternating current and operates at 5V and produces an analog output voltage proportional to the measured current. Hall effect current sensors can convert magnetic information into electric signals. It uses Hall effect to convert current inputs into voltage outputs. In Hall effect, electrons from an electric current flow through a magnetic field plate. The field then causes the electrons to push to one side of the plate and produce a voltage difference between the two sides. The difference in voltage from the side of the plate is the output of the sensor.

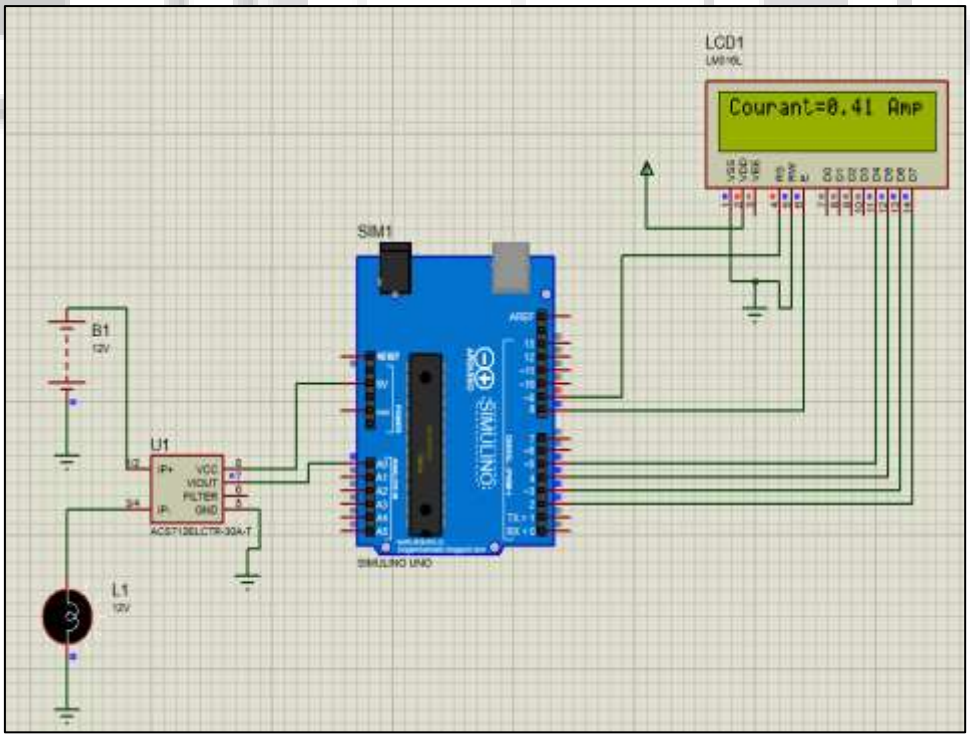
II. METHODOLOGY

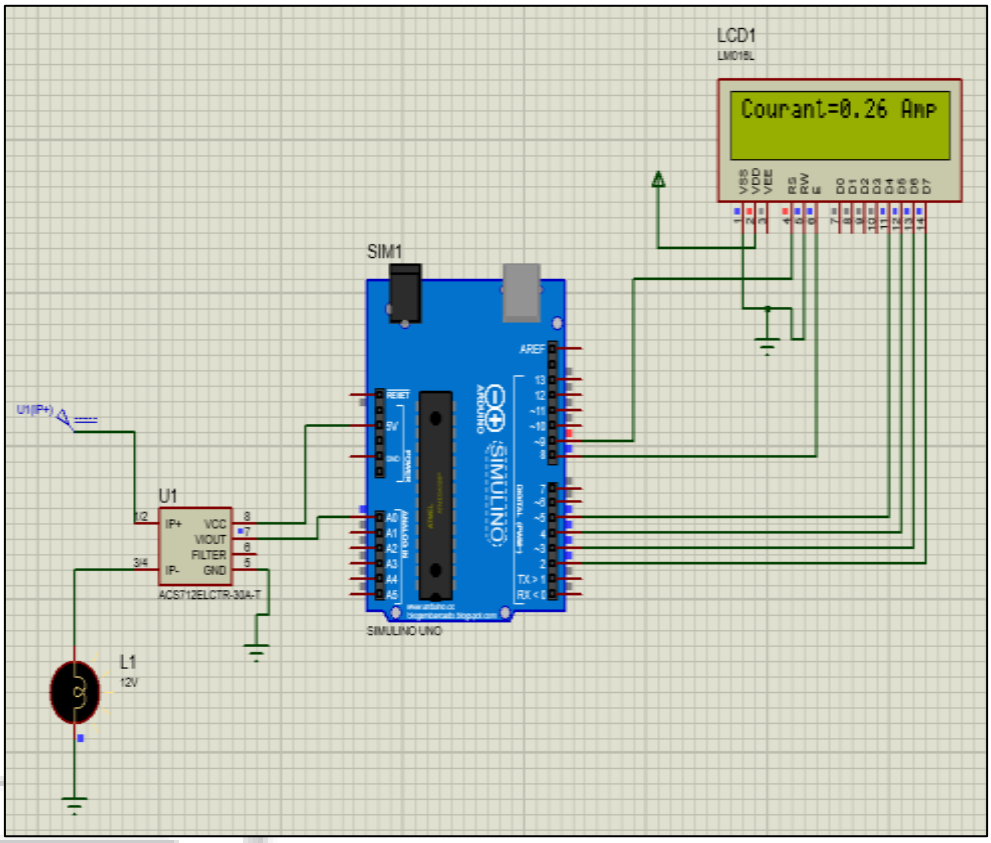
Current sensor is interfaced with Arduino Uno board and output is displayed on the LCD. Input to the current sensor is given through the power supply and load is connected through which current is measured.

A. Block diagram:



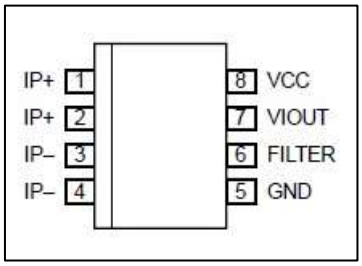
B. Simulation Diagram:



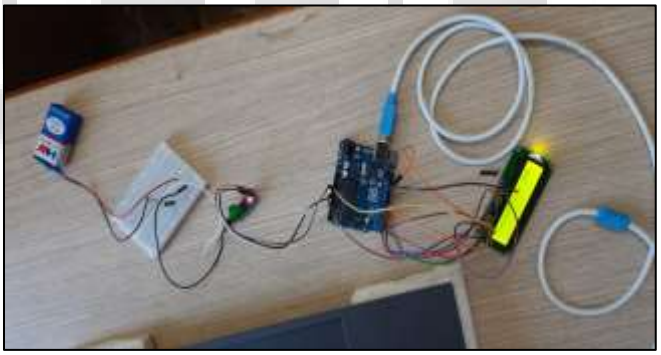


III. HARDWARE ASSEMBLY

Step 1: Connect positive terminal of power supply to positive input of the current sensor.
Step 2: Connect one end of any load to the negative terminal of the source.
Step 3: Connect other end of the load to the negative input of the current sensor.
Step 4: Connect Vcc pin of current sensor to 5V of the Arduino.
Step 5: Connect ground of current sensor to ground pin of the Arduino.
Step 6: Connect output pin of current sensor to the A0 pin of the Arduino board.
Step 7: Interface LCD with Arduino board.



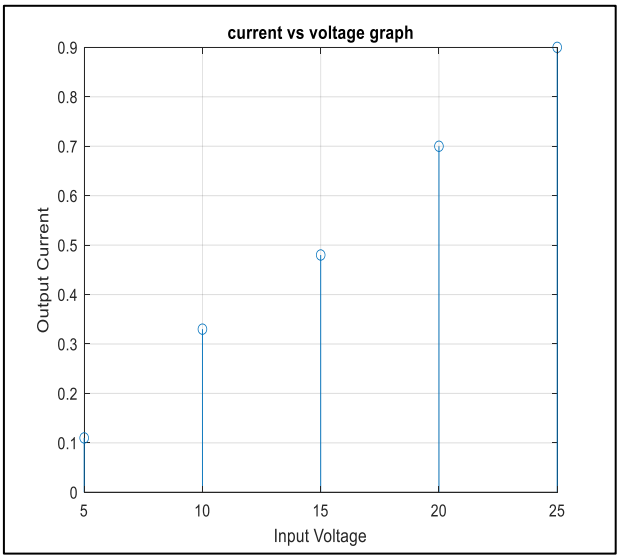
IV. CIRCUIT DIAGRAM



V. RESULTS

Following readings are obtained after performing the simulation.

S.No.	Input Voltage	Output Current
1	5 V	0.11 A
2	10 V	0.33 A
3	15 V	0.48 A
4	20 V	0.7 A
5	25 V	0.9 A



VI. REFERENCES

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