**Digital Tachometer using IR Sensor and Arduino**

**Overview**

This project implements a Digital Tachometer using an IR sensor, Arduino, and Proteus simulation software to measure the revolutions per minute (RPM) of a rotating object. The calculated RPM is displayed in real-time on a 16x2 LCD display.

**Components**

- Arduino Uno board

- IR sensor module

- 16x2 LCD display

- Rotating object (e.g., fan, disk with reflective markers)

- Proteus simulation software

**Working Principle**

1. The IR sensor detects the reflective markers on the rotating object, generating pulses.

2. The Arduino counts the pulses over a defined time interval.

3. The RPM is calculated using the formula: RPM = (Pulse Count / Time Interval) × 60.

4. The calculated RPM is displayed on the LCD in real-time.

**Circuit Connections**

IR Sensor Connections:

- IR Sensor GND Pin — GND

- IR Sensor VCC Pin — VCC (+5V)

- IR Sensor OUT Pin — Arduino Pin D8

**LCD Connections:**

- LCD Pins 1, 3, 5, 16 — GND

- LCD Pins 2, 15 — VCC (+5V)

- LCD Pin 4 — Arduino Pin D7 (RS)

- LCD Pin 6 — Arduino Pin D6 (E)

- LCD Pin 11 — Arduino Pin D5 (D4)

- LCD Pin 12 — Arduino Pin D4 (D5)

- LCD Pin 13 — Arduino Pin D3 (D6)

- LCD Pin 14 — Arduino Pin D2 (D7)

**Simulation in Proteus**

1. Create a new project in Proteus and add the required components: Arduino Uno, IR sensor, and LCD display.

2. Connect the components according to the circuit diagram.

3. Load the compiled Arduino code into the simulation.

4. Run the simulation and observe the rotating object (e.g., fan) in the Proteus environment.

5. The LCD display will show the real-time RPM measurements.

**Conclusion**

This Digital Tachometer project demonstrates the integration of an IR sensor, Arduino, and LCD display to measure the RPM of a rotating object. The Proteus simulation allows for easy testing and validation of the system before implementing it on physical hardware.