# Smart Energy Meter with Load Monitoring and Overload Protection

## 1. Project Summary

This project presents a Smart Energy Meter system that monitors electrical energy consumption in real-time using a current sensor (ACS712) and an Arduino Uno. The consumption data is displayed on an LCD, and if the connected load exceeds a set threshold, the system triggers a buzzer and disconnects the load via a relay module.

This is useful for homes and industries to monitor load usage and prevent overload conditions, enhancing safety and encouraging efficient energy usage.

## 2. Components Used

- Arduino Uno
- ACS712 Current Sensor
- LCD Display (16x2)
- Relay Module (5V)
- Buzzer
- Connecting Wires
- Breadboard or PCB

## 3. Objectives

- Monitor real-time current and power usage.
- Display consumption on LCD.
- Automatically cut off the load during overload.

- Raise alert using buzzer when threshold is crossed.

## 4. Working Principle

The ACS712 current sensor measures the current flowing through the load. The Arduino processes this data and calculates power consumption. If the load exceeds a set value, the Arduino activates the buzzer and turns off the relay,

disconnecting the load. The LCD continuously displays power usage.

## 5. Domain

Electrical Engineering