

Insert team members name (TL First)}
Supervisor : << Name of the Supervisor >>

Abstract

- The project involves the design and implementation of a smart energy meter that sends real-time power consumption data to customers via SMS using GSM technology. This innovative solution aims to enhance consumer awareness and optimize energy consumption.

Background

- Smart energy meters are an integral part of the modern energy grid, enabling consumers and utilities to track and manage electricity usage effectively. Traditional meters lack real-time communication features, which limits their ability to inform consumers promptly about their energy consumption. The integration of GSM technology addresses this limitation.

Methods

- The smart energy meter system is designed using an Arduino microcontroller integrated with a GSM module. The key hardware components include the Arduino, which serves as the central processing unit, the energy meter for measuring real-time electricity consumption, the GSM module for sending SMS alerts, and an LCD display for providing immediate feedback to users. The system operates by continuously monitoring electrical parameters through the energy meter, which sends this data to the Arduino for processing. The Arduino calculates total power consumption and formats this information for transmission via the GSM module. At predefined intervals or when a significant change in power usage is detected, the system sends an SMS to the user's mobile phone with details such as current readings, total energy consumed, and cost estimation. The system also supports threshold alerts, notifying users when their energy consumption exceeds certain limits. Calibration routines are implemented during setup and periodically thereafter to ensure accuracy. The system undergoes extensive field testing under various load conditions to validate its reliability and responsiveness, ensuring it meets industry standards and performs effectively in real-world scenarios.

Future Perspectives

- Future work could involve integrating this system with mobile applications for enhanced user interaction, adding features like usage forecasts, and expanding the system to support multiple communication methods such as Wi-Fi or Bluetooth.

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