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(57) Abstract :

The present invention relates to an Internet of Things (IoT)-based Smart Energy Meter designed to monitor, analyze, and control electrical energy consumption in real time. The system comprises a microcontroller integrated with voltage and current sensors for measuring key electrical parameters such as voltage, current, power, and total energy consumed. The collected data is processed and transmitted via a wireless communication module—such as Wi-Fi, GSM, or Zigbee—to a cloud server or mobile application, enabling users to access their energy usage information remotely. Through an intuitive mobile or web interface, users can view real-time and historical consumption data, receive alerts for abnormal usage or overloading, and remotely control connected electrical appliances to optimize power utilization. The system further supports automated billing, threshold-based notifications, and energy theft detection, ensuring transparency and reliability in energy management. Additionally, artificial intelligence algorithms may be employed to predict energy consumption patterns and provide personalized recommendations for energy conservation. The invention enhances the efficiency, accuracy, and accessibility of traditional energy meters, contributing to smarter, safer, and more sustainable energy management systems.

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