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International Journal of Advanced Electrical and Electronics Engineering

ISSN: 2278-8948
Volume 14 Issue 01, 2025

Energy Safe Pro Prepaid Metering System

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Peer Review Information

Submission: 15 Feb 2025
Revision: 23 March 2025
Acceptance: 27 April 2025

Keywords

Prepaid
Energy Meter
GSM Module

Abstract

The aim of the project is to minimize the queue at the energy meter billing counters and to restrict the usage of energy meter automatically, if the bill is not paid. The project also aims at proposing a system that will reduce the loss of power and revenue due to power thefts and other illegal activities. The work system adopts a totally new concept of "Prepaid Energy Meter". The GSM technology is used so that the consumer would receive messages about the consumption of power (in watts) and if it reaches the minimum amount, it would
automatically alert the consumer to recharge. This technology holds good for all electricity distribution companies, private communities, IT parks and self-containing housing projects. The implementation ofthis project will help in better energy management, conservation of energy and also in doing away with the unnecessary hassles over incorrect billing. The automated billing system will keep track of the real time consumption.

Introduction

The technology of measuring electricity has come a long way since its invention over 100 years ago. Initially, meters were bulky and heavy, but over time, they've become smaller, more accurate, and feature-rich. The introduction of digital meters revolutionized the way we measure electrical parameters. Today, electronic energy meters are crucial in monitoring energy consumption.

However, with the increasing gap between energy production and consumption, energy distribution has become a significant concern. Frequent power failures and unequal energy distribution affect consumers. To address this, it's essential to regulate energy consumption. Governments can introduce Prepaid energy meters in households to monitor and manage energy usage, ensuring fair distribution and minimizing power cuts.

LITERATURE SURVEY

His paper praposesa initiative design to develop a system based on Prepaid Energy meter using GSM. To define revenue management as the application of information systems and pricing strategies to allocate the right capacity to the right customer at the right price at the right time. [1] Revenue management is an important tool for matching supply and demand by segmenting customers into different segments based on their

willingness to pay and allocate limited capacity to the different segments in a way that maximizes company‟s revenues.[2] Bluetooth based home automation system. (a) Host and client modules in a Bluetooth piconet. (b) An individual client module. N. Sriskanthan et al. Semantic Scholar extracted view of "Bluetooth based home automation system" by N. Sriskanthan et al.[3]

Proposed Methodology

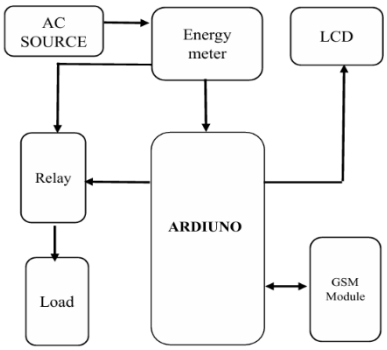

Fig.1: Block Diagram of the Energy Safe pro Prepaid metering system

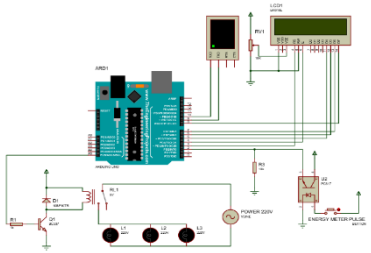

Fig.2: Circuit Diagram of the Energy Safe pro Prepaid metering system

The proposed prototype implemented in this paper is shown below in Figure This model has the Arduino UNO as CPU. The entire system is interfaced with Arduino UNO. The GSM module is serially connected with the controller which is used as communication module between User and provider. The module uses its own network for the transfer of data. Special coding in Arduino is used for programming AT89S51 microcontroller. The relay is used as switching device to cut off and restore power supply. The LCD is interfaced to microcontroller using parallel connection. In this project the Microcontroller based system continuously measures the readings and the current meter reading can be sent to the Electricity department on request. This system also can be used to cut off the power supply to the house in case of non-payment of electricity bills. This modem with SIM card is essential for each energy meter.

Future Scope

this method will reduce the energy wastage and save a lot of energy for future use Measurement of parameters like power line current and power line voltage has not been available in a satisfactory way to optimize power network management.

Result And Discussion

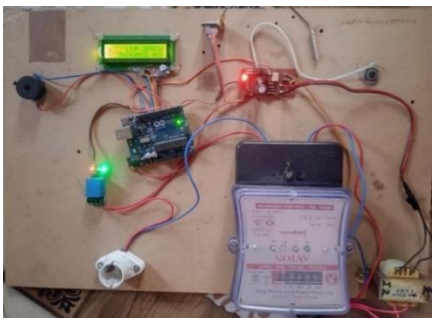

Fig. 3: Project Setup of the Energy Safe pro

Prepaid metering system

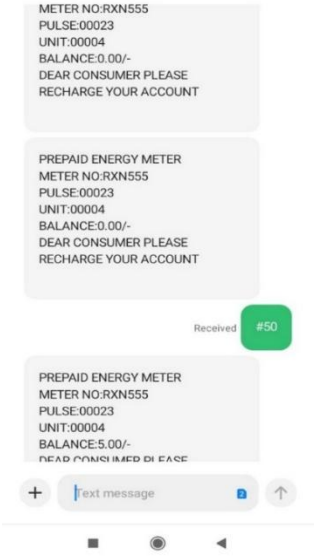

Fig.4: Project Meter Balance message Screenshot

Conclusion

The research conducted for the Prepaid Energy Metering System has highlighted its potential to transform energy management for both consumers and utility providers. By enabling real-time monitoring and control of energy consumption, this system empowers users to make informed decisions about their energy usage, ultimately leading to better budgeting and reduced wastage. The prepaid model effectively addresses issues of unpaid bills, thereby enhancing revenue collection and financial sustainability for utilities. Additionally, the data

generated from these meters can provide valuable insights into consumption patterns, allowing for more efficient grid management and improved service delivery. The integration of this technology paves the way for a more sustainable energy future, fostering responsible energy consumption and supporting the incorporation of renewable energy sources. Overall, the findings from this research underscore the importance of innovative metering solutions in creating a more efficient and user-centric energy landscape.

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