

# IOT BASED SMART ENERGY METER WITH POWER THEFT IDENTIFICATION

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**Abstract:** In this busy world the people are forgot to pay the electricity bill within the due date. So to reduce that problem we had introduced the smart energy meter. It is used to calculate the electric bill automatically and send the bill amount to the consumers with the help of GSM (Global Service Mobile) through SMS. The controller used in this project is 8051 microcontroller this will just act like a mediator for storing the SMS which is communicated between office and the consumers. Magnetic reed switch will ON and OFF the power to the respective consumers automatically by a single control for the person who not yet paid the bill on or before the due date, so we can eliminate the additional man power which is used earlier. We also added the theft control system; this system will identify that which consumer is pilfering the supply from other consumer furtively. Once the robbery connection is identified with the help of that system, then this will be informed to the authorized consumers through SMS.

**Keywords:** Smart meter, IOT (Internet Of Things), Theft Identification.

## 1. INTRODUCTION

People in this busy world, forgot to pay the electricity bill within the due date. So to reduce that problem we had introduced the smart energy meter. It is used to calculate the electric bill automatically and send the bill amount to the consumers with the help of GSM (Global Service Mobile) through SMS.

The controller used here is 8051 microcontroller this will act like a mediator and also store the SMS which is communicated between office and the consumers. This controller contains the register which is the temporary storage place where the data's are stored when the process is going on. The program in the controller is write using "keil" software. This will be like a heart of the system because this will help the system by providing the serial communication is programmed by using **tera term** software.

### 1.1 POWER THEFT IDENTIFICATION

Today the most challenging problems are the power theft. In previous days, power thefts are very complicate to identify manually. In this project we also added the theft control system; this system will identify that which consumer is pilfering the supply from other consumer furtively.

Once the robbery connection is identified with the help of that system, then it will be informed to the authorized consumers through SMS.

As said earlier LCD is used for displaying purpose. It show how much units consumed by the users, bill amount with billing date and due date for that bill amount.

This system will be advantageous to people because it will reduce the penalty amount which was given by the government if the bill is not paid on or before the due date.

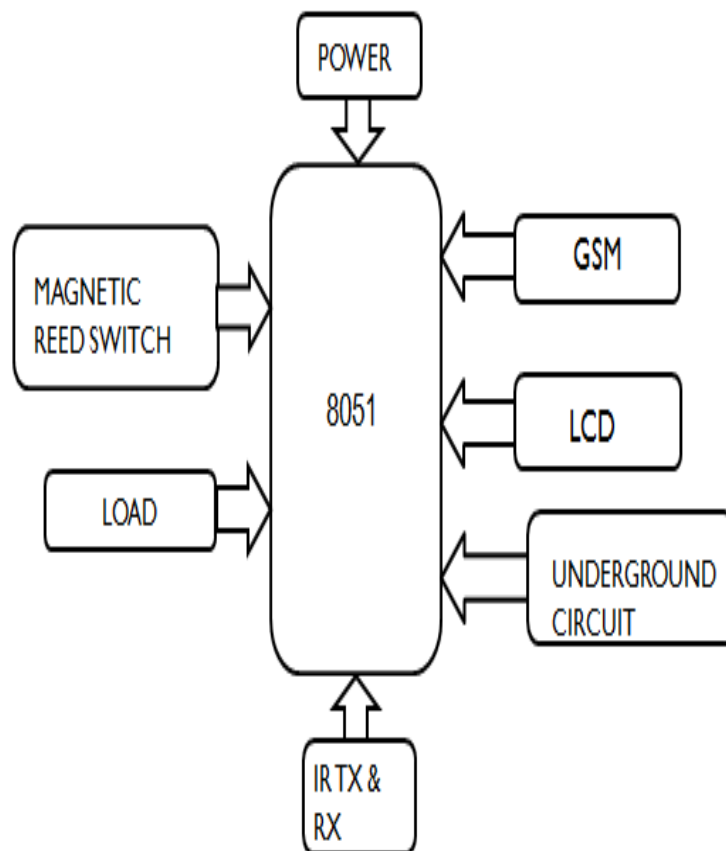
## 2. EXISTING SYSTEM:

The existing system consists of zigbee interfaced smart meter of wireless sensor home area network. To setup a reliable and costly effective smart electric power grid applications we use wireless sensor networks. The system also controls any device connected to the power outputs.

### 3. PROPOSED SYSTEM:

The main objective of the project is to make everyone to pay the electricity bill on be given by the government and also reduce the man power used. The human power can be reduced, there is no need for a person to come and visit our home for calculating the electric bill for our consumption. This is because we are using the particular software to transmit the data which means reading to the controller and then reading are calculated and intimated to the respective consumers through SMS. Once it's is identified that there is a pilfering in particular line means that it will be informed to the consumers through SMS about this theft.

### 4. BLOCK DIAGRAM:



#### 4.1.1 BLOCK DIAGRAM DESCRIPTION:

- The microcontroller, that is responsible for overall monitoring of the system.
- This is the 8 bit controller with two different buses (data bus and address bus).
- The major function of this controller is record and transfers the data between the EB station and consumers.
- When the power theft happened at any distribution line immediately alert message will be send to the consumes through GSM using serial communication.
- The supply to the respective house is shut down from the EB station itself with the help of magnetic reed switch.
- The process will be repeated if they fail to pay the bill amount on or before the due amount.

## 5. THEFT CONTROL:

- There are two types of controlling process in theft control.
- IR sensor is the first process in theft control and it is used for identifying the tapering of seal.
- Thefts of energy meter that don't work properly are one of the major causes of commercial losses.
- Checking the billing procedure of the utility can be the first step to reduce commercial losses.
- To do that the consumer data base must be always updated, reflecting any change verified in the field with the smallest time delay.
- This data base is important not only for auditing the billing. Once the robbery connection is identified with the help of that system, then it will be informed to the authorized consumers through SMS.

## 6. FUNCTIONAL SECTION:



Fig. Advanced infrastructure metering system

- Improved efficiency on spectrum
- International roaming System
- Low-cost mobile sets and Base stations system (BSS)
- Compatibility with Integrated Services Digital Network (ISDN) and other telephone company services
- Support for new services

## 7. EXPERIMENTAL SETUP:

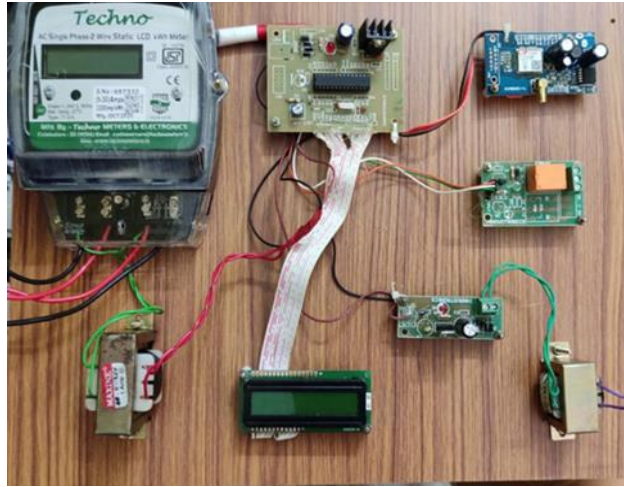


Fig. Hardware setup of smart energy meter and theft control

### 7.1.1 OUTPUT:

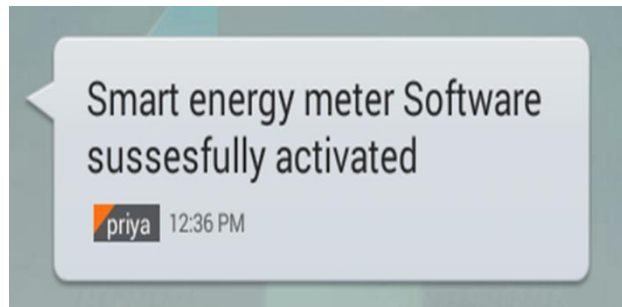


Fig. Message received by the customer once the system is activated.

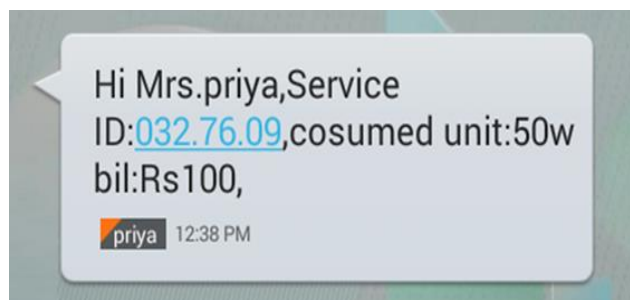


Fig. unit consumed and amount send to the customer.

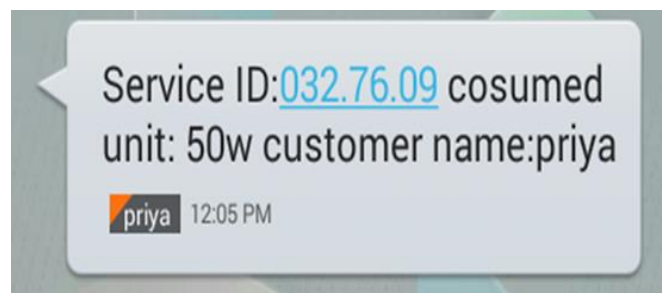


Fig. Message received by the EB station.

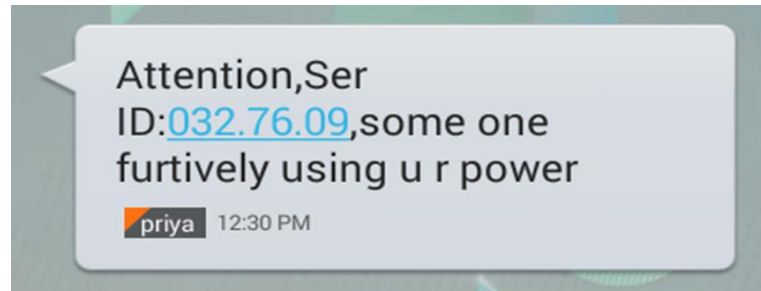


Fig. Theft detection message to the customer.

## 8. CONCLUSION:

From this project the electricity bill are send to the customer through SMS along with due date using GSM, so that everyone can able to pay it earlier. By this we can reduce the additional man power required to issue a bill to each and every house. The power theft can be easily detected and reported to the authorized customer with the help of GSM. Hence power is saved in large amount which is utilized for the development of better future. The purpose of using the magnetic reed switch is we can shut down the power supply, when the customers not pay the bill amount or some unauthorized person using the supply of others from the substation itself. Here also we are reducing the man power. In future some other advanced technique like artificial intelligence can be used and the billing system, theft control are designed more effectively.

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