SMART ELECTRONIC DEVICE MONITORING

P. Abhishek
CSE Department, SCSVMV University, Kanchipuram, Chennai, India
B. Yashwanth Sai
CSE Department, SCSVMV University, Kanchipuram, Chennai, India
Ms. E. Padma
Assistant Professor, CSE Department, SCSVMV University, Kanchipiram, Chennai, India

Abstract— The aim of the project is to minimize the queue at the electricity billing and to restrict the usage of electricity automatically, if the bill is not paid. The meter is important in making the consumer having sense about his/her energy consumption. If the customer didn't pay the bill before due date the connection cut through IOT. Also the payment can be done using the prepaid RFID Given to the user and also it will give alert when the amount in the card reduces to the cutoff level. The implementation of this 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 and will leave little scope for disagreement on consumption and billing. The designed energy meter consists of an RFID reader, a microcontroller, a LCD and an IoT. An RFID reader is used to read the Customer's information. The LCD display will display the Energy and the amount for the Energy.

1. INTRODUCTION

The existing system, electricity meter reading for electricity usage and billing is done by human workers. This can be overcome by introducing IOT, the meter reading will be calculated directly. Human workers billing are prone to reading error such as sometime the houses electric meter is placed where it is not easily accessible. So by using RFID of a customer, IOT technology is used to send information correctly. The energy provider operation cost for meter reading can be reduced. Paper billing has the tendency of losing in post box or bill may be lost. This can be overcome by sending bill with unique RFID. More energy will be conserved with this device.

2. PURPOSE OF THE PROJECT

RFID used for billing payment. IOT based energy meter system.

Smart meters have been designed for various features like remote monitoring of energy consumptions, remote turn ON/OFF power supply through IOT.

The device should be controlled directly. This may lead to more energy consumption.

Power cutoff through online. Its easy to manipulate for bill generation and other such tasks to service provider.

Current Sensor used to calculate the Energy Consumptions and measuring the current.

3. SCOPE OF THE PROJECT

 The system designed reduces the efforts of manual data collection of energy meter.

Also, data which is received at service provider side is easy to manipulate for bill generation and other such tasks.

Power cut off through online.

4. MODULES

Arduino:

Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices
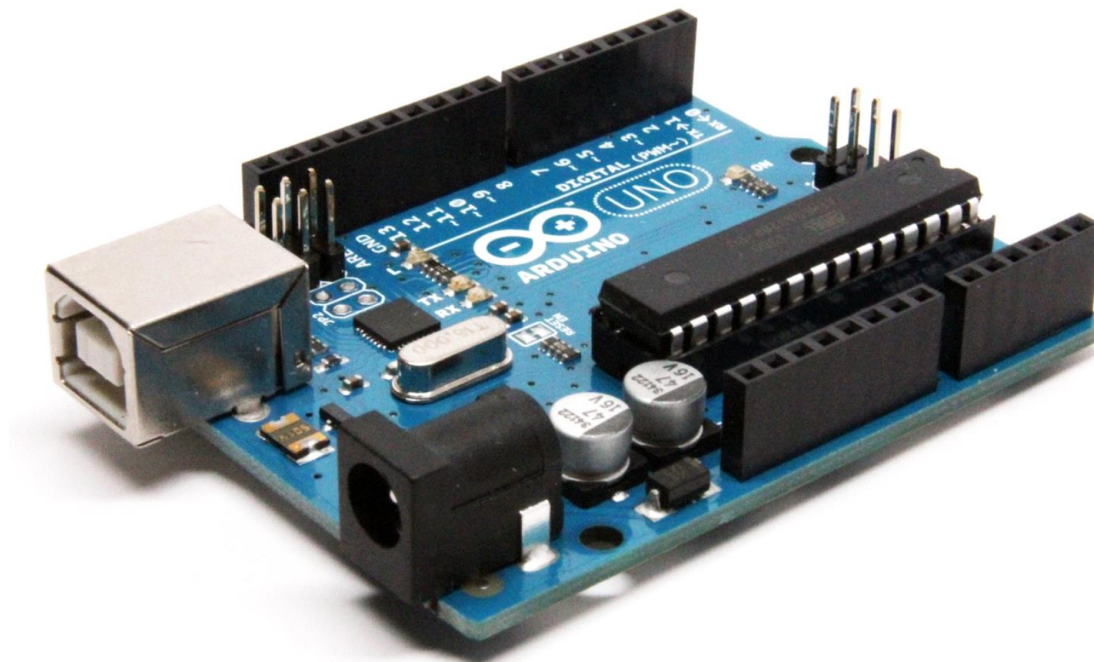
RFID Reader:

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. An RFID tag consists of a tiny radio transponder; a radio receiver and transmitter.
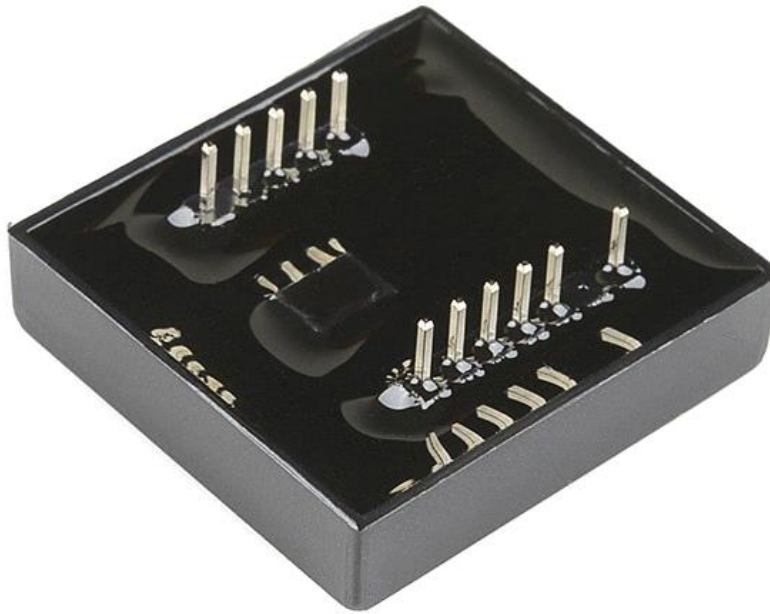
LCD Display:

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.
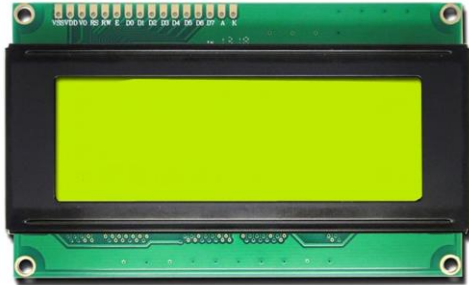
Current Sensor:

A current sensor is a device that detects electric current in a wire and generates a signal proportional to that current. The generated signal could be analog voltage or current or even a digital output.
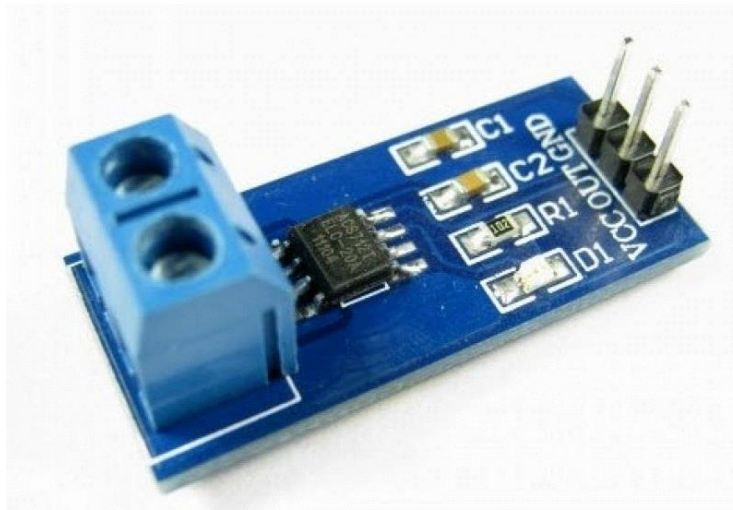
MQTT:

MQTT is a software or app that allows the user to message receiving from a smartphone. It is also used to control the hardware remotely. We have used MQTT as receiver in mobile phones. The MQTT server is responsible for the communication between the hardware unit and the smartphone.

LOAD:

An electricity meter ,electric meter, electrical meter or energy meter is a device that measures the amount of electric energy consumed by a residence, a business or an electrically power device. This electrically power device which consumes the current and makes the meter to run for the readings is called a load from which the sensor is connected to sense the current.

Relay:

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.
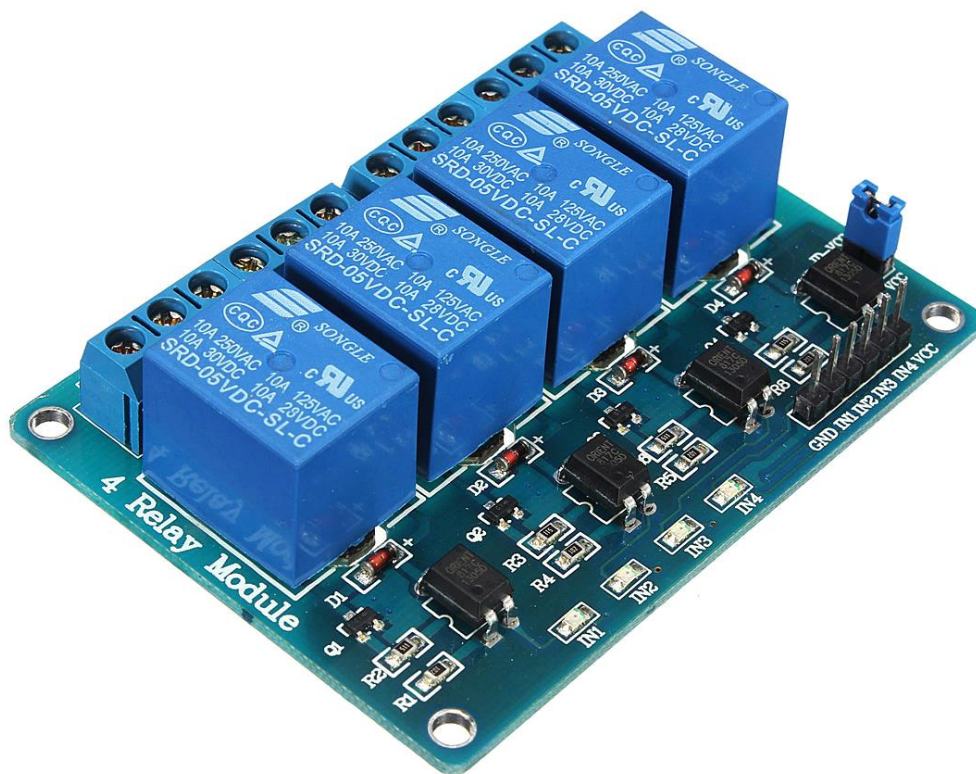
5. LITERATURE SURVEY

In the existing system, electricity meter reading for electricity usage and billing is done by human workers from home to home and building to buildings. This requires huge number of workers and long working time to achieve complete area data collection and billing. Human workers billing are prone to reading error as sometime the houses electric meter is placed where it isn't easily accessible. Labor billing job is sometime also restricted and slowed down by bad environmental condition. Paper billing has the tendency of losing in the post box.

The increased development of residential housing and industrial buildings in the developing country such as for example, India require more human workers and longer working hours to complete the usage reading task. These increases the energy provider operation costs for meter reading.

6. Block Diagram
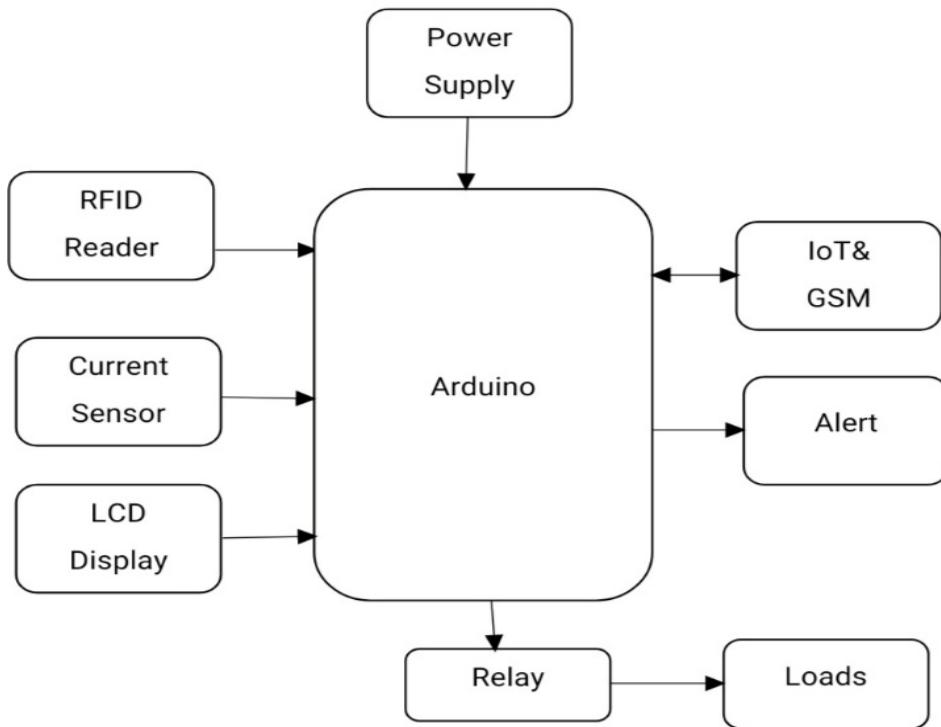
EB SIDE:
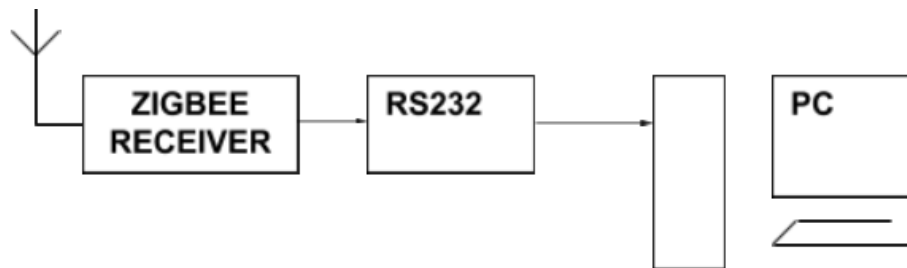
WEBSERVER:

• Existing System:

The present system only provides feedback to the customer at the end of the month that how much power is consumed in the form of bill.

The consumer has no way to track their energy usage on a more immediate basis.

The consumers are growing exponentially fast and load on power providing divisions is rapidly rising.

In the existing system meter tampering can be done easily and it's one of the major drawbacks for an energy crisis.

• Proposed System:

RFID used for billing payment. IOT based energy meter system.

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7. Hard Ware Components

- Arduino
- RFID Reader
- Current Sensor
- LCD Display
- GSM
- Relay
- Load
- Alert
- IoT

Software Components:
- Arduino IDE / MQTT
- Embedded C Language

8. CONCLUSION

Thus the project explains the basic structure and system design for IOT based energy meter billing and monitoring system. It also explains the basic blocks and components used in this system. It's a complete case study for the proposed system design. The system is very much helpful for reduction in energy wastage and prevention in electric shortage. In this system consumer can do power management by knowing energy usage time to time. Using this system we can provide real time bill monitoring system and time reduced billing system.

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