



# POWER MONITORING AND THEFT DETECTION SYSTEM

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**Abstract:** To overcome the problem of overbilling, Meter tampering and to ensure a cost-effective operation, this project aims to design a power monitoring system. In this system the microcontroller is used to detect the power theft and passes the information to electricity board with the help of an IOT application. The whole network uses LCD, current sensors, energy meter, microcontroller, IOT module, PCB board, alarm, relay, voltage regulator. Relay is used as a switch to disconnect the load and to stop the theft.

**Keywords:** Electricity Thefts, Monitoring System, Meter Tampering.

## I. INTRODUCTION

In the society it is seen that lot of people involve in illegal power theft like unauthorized tapings from electric lines during gatherings, meter bypassing etc. this power theft must be controlled as much as possible. IOT is the evolving technology, previously many systems were implemented, this project are implements an advance IOT technology. Generation, transmission and distribution of electrical energy involve many operational losses. We can define the losses in generation of power technically but distribution and transmission losses cannot be precisely quantified with transfer of information.

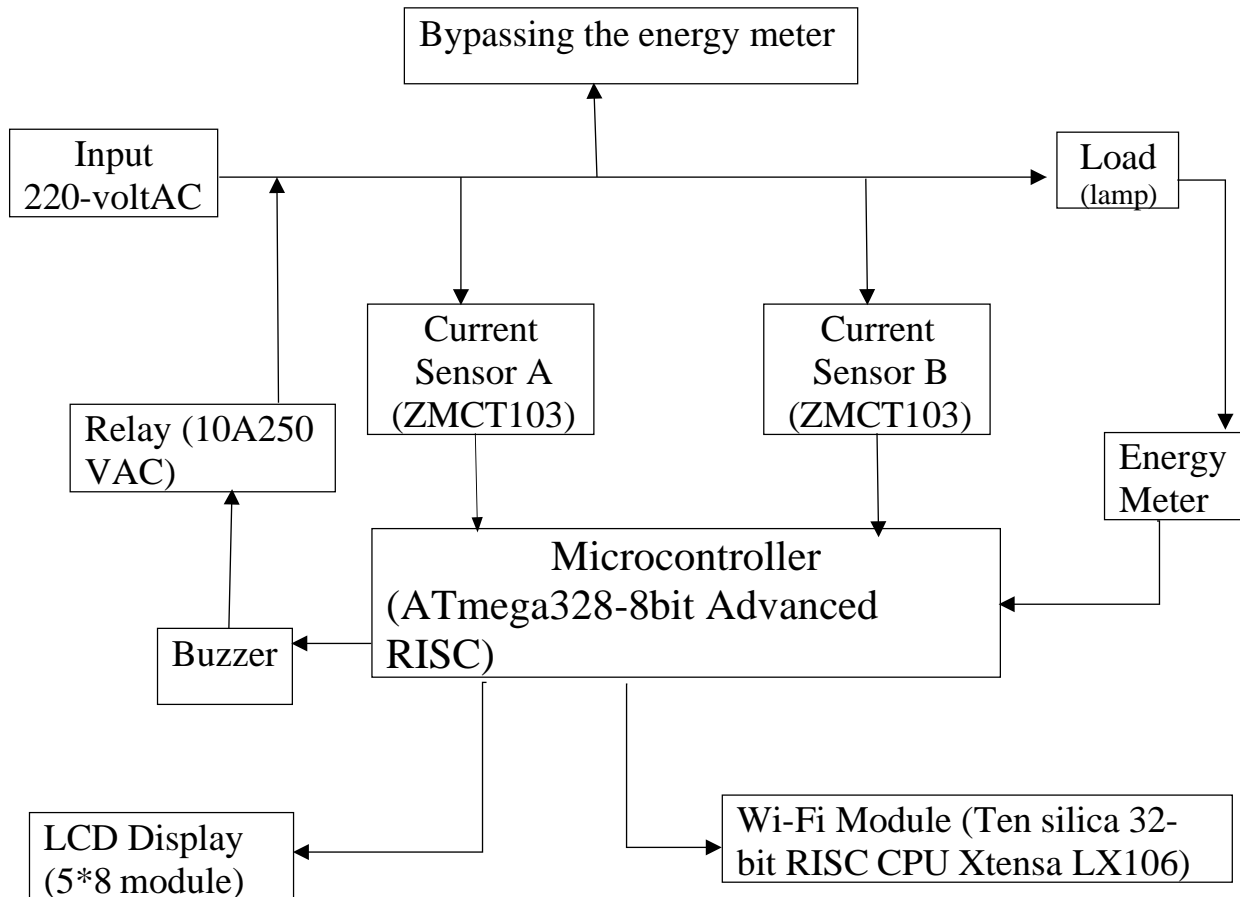
This illustrates the involvement of nontechnical parameter in transmission and distribution of electricity. Moreover, technical losses occur naturally and are caused because of power dissipation in transmission lines, transformers, and other power system components. Technical losses in Transmission & Distribution are computed with the information about total load and the total energy bill. While technology is in the raising slope, we should also note the increasing immoral activities.

This system prevents the illegal usage of electricity. At this point of technological development, the problem of electricity can be solved without any human control using IOT. The implementation of this system will save large amount of electricity there by electricity will be available for a greater number of consumers. In highly populated country such as India, power theft can be defined as the usage of the electrical power without any legal contract with the supplier.

We are using Atmega328 microcontroller and two current sensors for accurate output. If we use two current sensors, we can compare both sensor values for theft detection.



## II. METHODOLOGY



**Figure 1:** Block Diagram of Power Monitoring and Theft Detection System

- Arduino ATmega328-8bit Advanced Virtual RISC Microcontroller used as a realtime high-speed system.
- Two Current sensor and voltage sensor for collecting information from main power line.
- Voltage sensor and two current sensors used for measuring the load. One sensor A is placed at near to distribution pole. Another sensor B placed near the entry of home.
- If theft is not there then both sensors will provide same value to microcontroller.
- If theft is happening in between then value of sensor A will be high as compare to sensor B.
- Once theft detected, microcontroller will send information to LCD display and IOT module for cloud update.
- Buzzer will get activated in theft condition as well as the load will get shutdown for particulate object.
- The energy consumption will be measured by the energy meter and with help of sensor.
- With that service provider will be able to see total consumption unit count daily from IOT.

### FLOW CHART

The flowchart shows the overall operation of the system following software to control the servo motor.

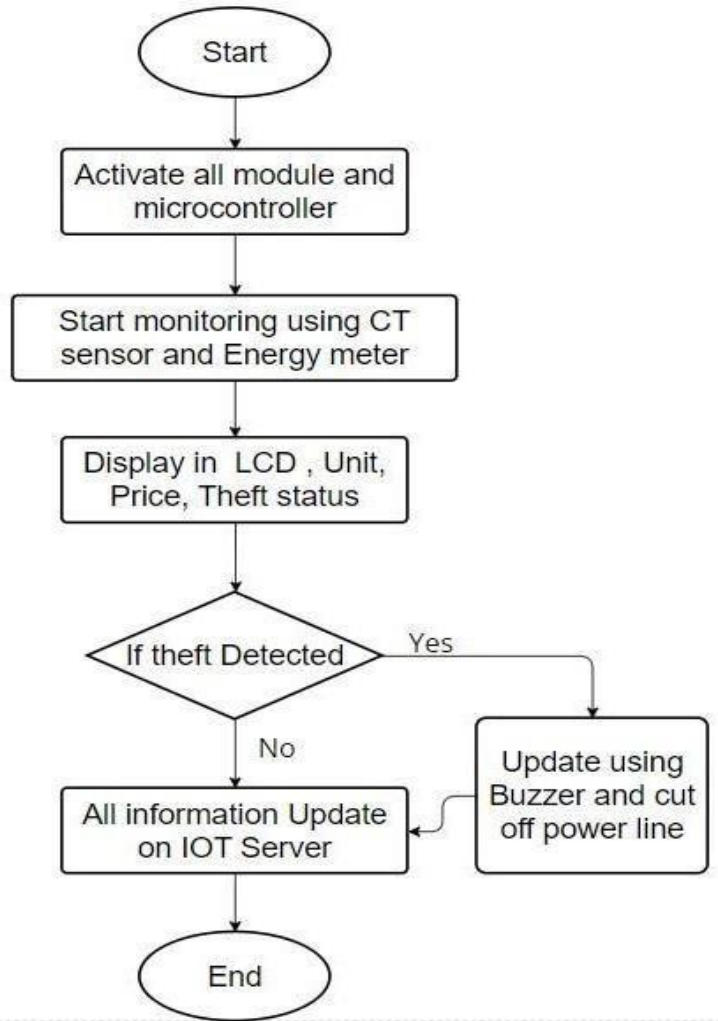


Figure 2: Flow Chart

III. RESULT

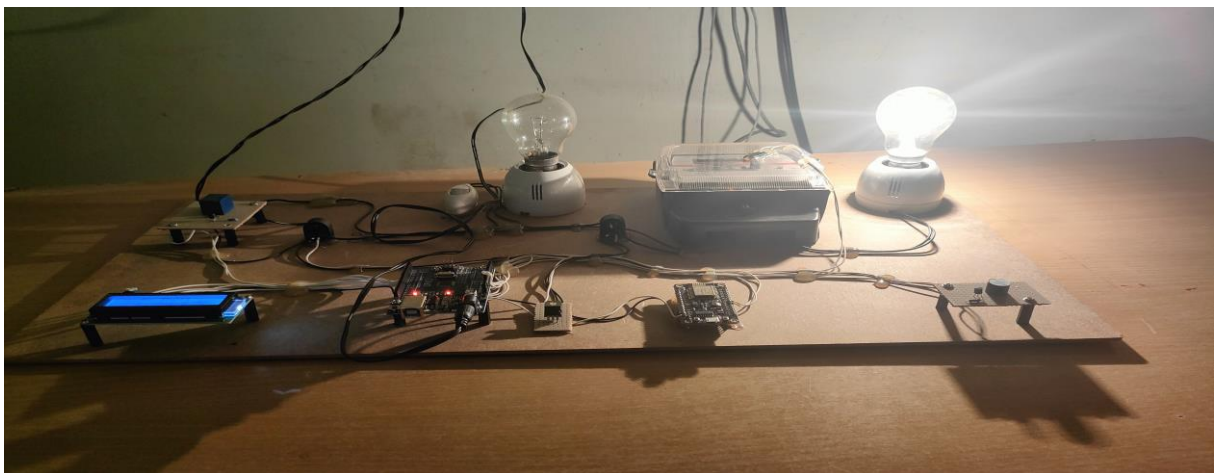


Figure 3: Condition of circuit before theft

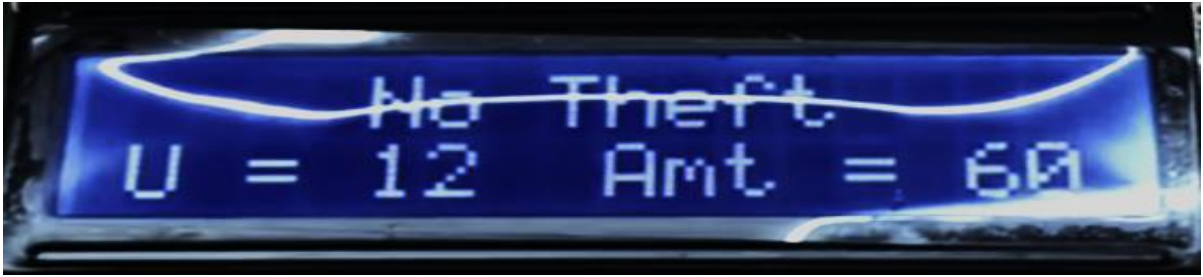


Figure 4: LCD Display in normal condition



Figure 5: Condition of circuit after theft

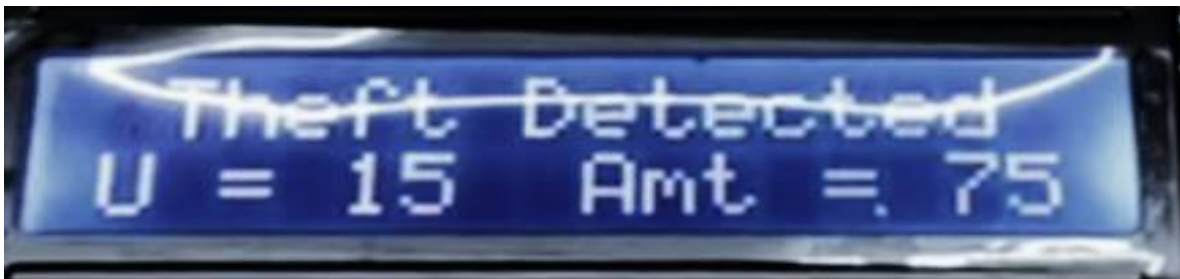


Figure 6: LCD Display after power theft

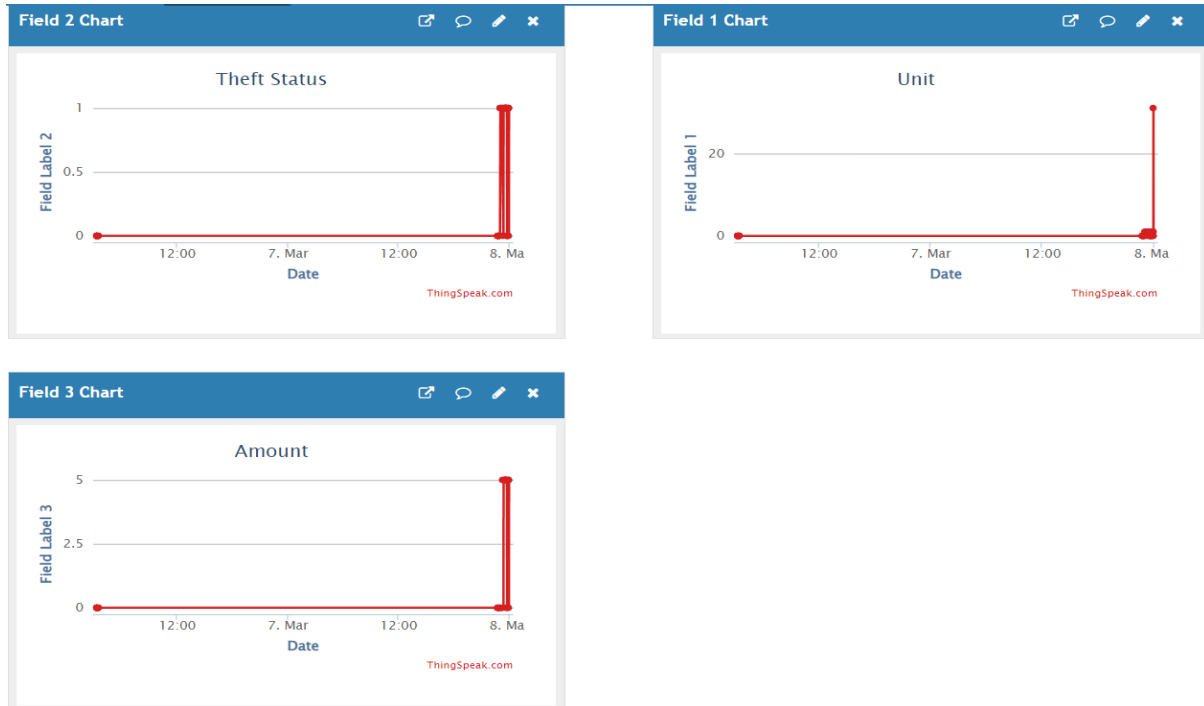


Figure 7: No theft

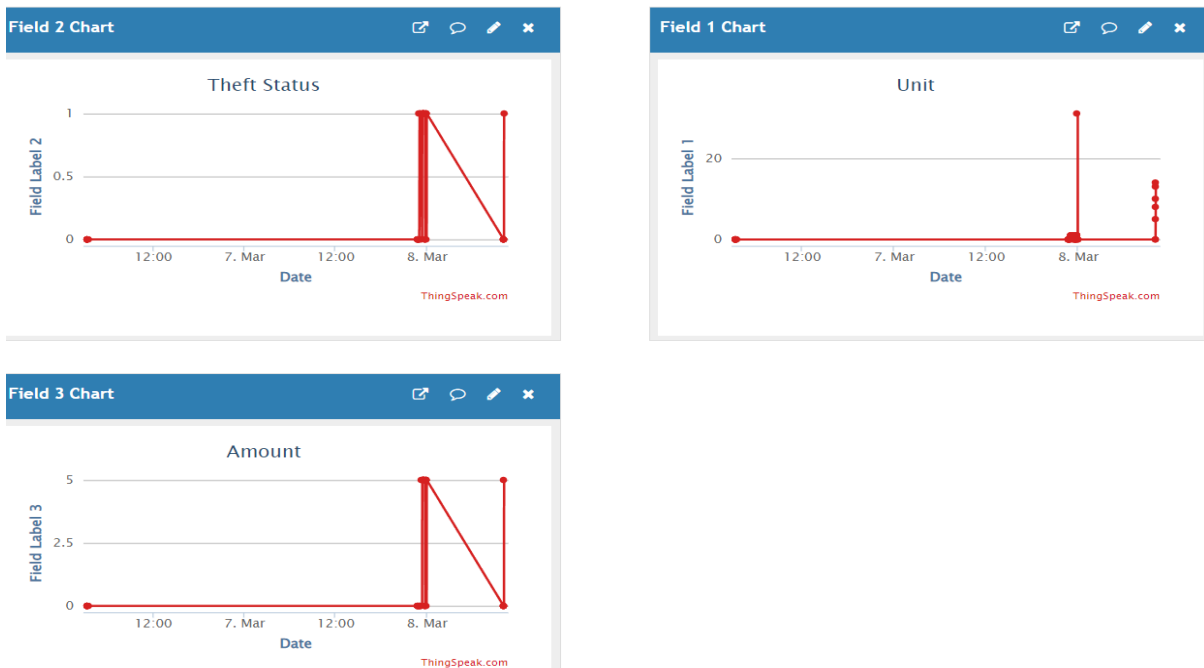


Figure 8: Theft detected

As shown in the figure 6 the amount and unit is displayed on LCD display. IOT based Power monitoring and theft detection system is proposed in this project. In this project the system will monitor and report when there is a power theft. The power theft is identified and the information is sent through IOT and also Displays on LCD screen. So, that they can take instant action to prevent the power theft. With help of energy monitoring system, the unit count and billing amount will be monitored. This information in microcontroller is updated to IOT cloud and the users will be able to see total consumption unit count.



#### **IV. CONCLUSION**

It requires only one time installation cost after installation this can be used with ease for lifetime which acts as a great advantage. This project can be implemented in industries and any such places which require a large amount of electricity which will ensure that no wastage or any related theft of electricity takes place. It will completely eliminate the power theft and will increase revenue for the Government and contribute to the betterment of the society. We can make this project more users friendly by introducing a GSM module and also by using other low cost components. Further more we can also modify the project in many ways like we can introduce a concept of IOT through which the customer will notified if any unwanted interruptions or threat is sensed in their electric meter which will give a sense of control to the customers. Also we can enhance the system in a way such that it will keep the track of the time about when the theft of electricity took place and will also indicate the about of electricity that was lost due to theft. It will also identify the medium and mode through which loss of electricity took place.

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