International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 04 | April - 2022 Impact Factor: 7.185 ISSN: 2582-3930

ENERGY METER WITH THEFT DETECTION

Mrs. Anu G Pillai, Prakhar Kumar Agnihotri, Pushpendra Shukla, Piyush Pandey, Raj Nayak

Shri Shankaracharya Technical Campus,

Junwani, Bhilai-490020(C.G.), INDIA

Abstract- Electricity has now become an essential part of our lifestyle. Today we can't imagine life without electricity. Electricity theft causes huge loss of revenue for the power distribution companies of both government and private sector. These thefts result in overloading and thus result in power outage. This also not only causes burden on utilities but also immoral to the customers those who actually pays bills by honesty. The objective of this paper is to design a system that tries to minimize illegal use of electricity.

INTRODUCTION -

Electricity theft is a widespread issue, particularly in our country. As a result of our large population, we utilise a lot of electricity. In the generation, transmission, and distribution of electrical energy, there are numerous operational losses. While the losses associated with generation can be precisely defined, With the sending end information, transmission and distribution losses cannot be exactly measured. When it comes to T&D,The overall load and the total energy bill are used to calculate technical losses. Theft of electricity is a serious problem. AS a result, it must be entirely eradicated. It is necessary to keep a close eye on power consumption and losses in order to ensure that the generated energy is put to the best possible use. The technology guards against unauthorised use of electricity.

In latest global power has turn out to be an indispensable part of our regular life. It is a primary riding aspect for advances in technology. In a growing united states like India with such a massive populace who wishes get right of entry to to power, the metering of power utilization at family degree proves to be a manpower good sized mission wherein a consultant from the power enterprise is going door to door and takes readings from meters hooked up at houses and offers payments to subscribers that's to be paid. Also, power robbery is pretty common which in addition lines the already stressed power grid in our united states. It is a threat in phrases of sales for the power boards/companies.

Methodology-

In this project we begin or prevent the meter thru a completely precise quantity SMS thru gsm system. This PIN quantity is despatched to microcontroller. Here the microcontroller is the flash kind re programmable microcontroller which we've got were given already programmed with PIN quantity. So, the

typed PIN quantity is as compared with saved quantity if the PIN quantity is legitimate the microcontroller turns on the relay cause stress circuit. Relay output is straight away given to meter system. Now we are able to begin the meter. This is for the cause of robbery identity and prevention. The microcontroller is likewise programmed to limition the strength intake to a nice limition for precise periods of time. The microcontroller will transfer off the lighting and fans if the intake limition is passed for a specific time of the day.

Here is the circuit diagram of the theft detection system shown below which consists of Arduino or microcontroller, LCD screen, relay, GSM module, energy meter. The system can be broadly divided into three sections or units which are **power supply unit** then **metering unit** and at the last **theft detection** unit. The whole process of theft detection, locating theft site, cutting of the power, sending theft information message to the power supply management department or distribution company and maintaining record of power consumption by consumers is carried out by these three units which are power supply unit, metering unit and theft detection unit.

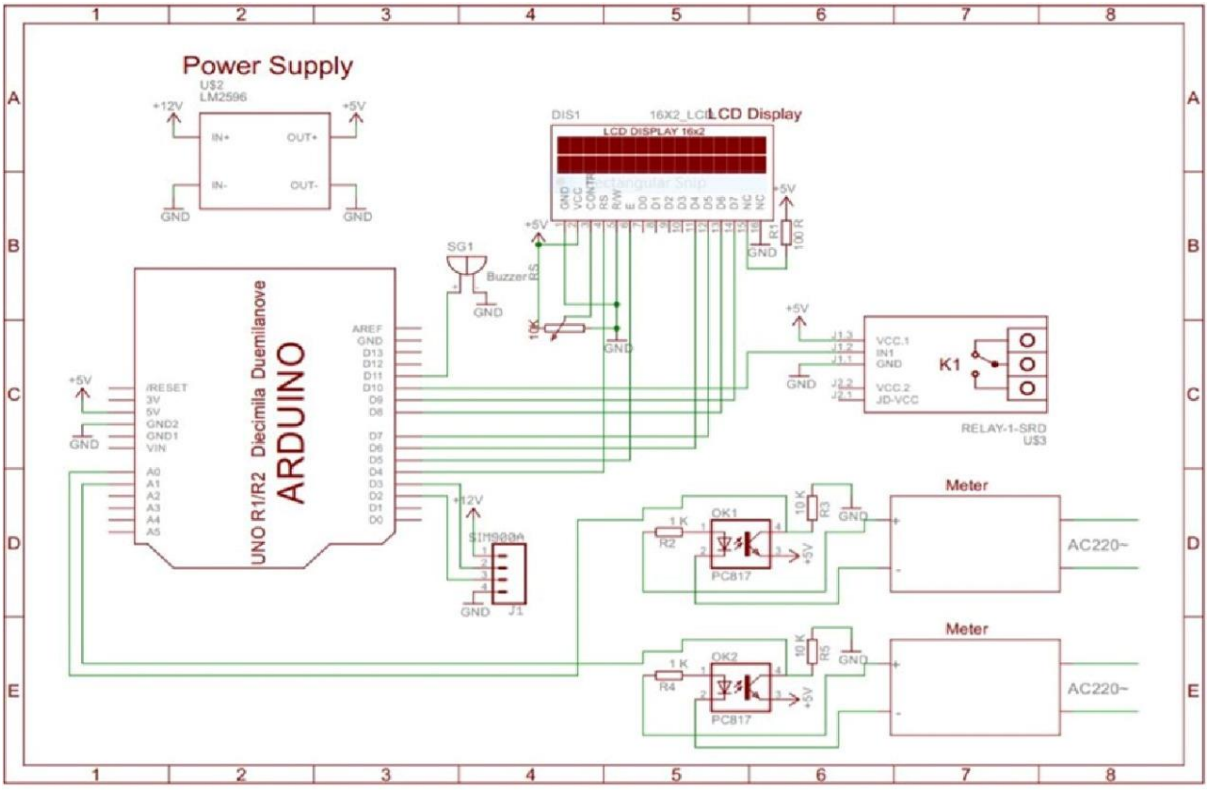

Fig. Circuit Diagram

The power supply unit is responsible for supplying power to components such as microcontroller and LCD screen. It converts 220V ac to 12V ac. This ac voltage is converted into dc voltage which is further passed to voltage regulator which provides 5V dc output. This output is fed to microcontroller and LCD screen.

The second unit is metering unit which keeps records of number of units consumed by consumers and to display it on screen. The programming of microcontroller helps to keep records of consumers power consumption.

The last unit is theft detection unit which detects the theft detection. Theft or any tampering with meter is detected by sensors and signals are sent to microcontroller and relay. The relay helps in isolation of power supply to consumer and message is sent to authority through GSM module by the help of microcontroller.

Components list

1.GSM Module

2.Arduino

3.Relay

4.LCD Display

5.Current Sensor

6.Capacitor

7.Diodes

8.Voltage Regulator

9.Transformer

10.PCB and Breadboards

11.Energy Meter

12.Loads

13. Resistors

14.Switch

15.Cables and Connectors

16.LED

Conclusion

- Our project aimed to reduce huge revenue losses that occur due to power theft by consumers.
- This will also help in reducing unnecessary heavy power demands at sub stations.
- We by designing this would like to conclude that power theft can be effectively restrain by detecting location of power theft and to inform the concerned authorities.
- An Automatic circuit breaker can be integrated with the unit which can help the authorities to cut off power supply of that house or consumer which indulges in such theft.
- Our system holds ability of informing or sending data using wireless links. This adds a possibility of controlling power supply by the electricity board.
- Thus by above mentioned design we will be able to address problems related to power theft in a completely automated, cost effective, wireless and in a reliable way.

REFERENCES

[1] Muhammad Ali Mazidi and Janice Gillespe, The 8051 Microcontroller and Embedded Systems, I/O Programming, Printice Hall

[2] Kenneth J. Ayala, The 8051 Microcontroller: Architecture, Programming, and Applications, 8051 Architecture, Penram International Publications, 1997

[3] Rangan C S, Sharma G R, Mani V S V, Instrumentation Devices and Systems, Instrumentation Amplifiers and Signal Conditioning, Tata-McGraw-Hill Ltd

[4]Nikovski D, W. Z. (2013). Smart Meter Data Analysis for Power Theft Detection.

[5] Nilesh Mohite, R. R. (2016). GSM Based Electricity Theft Detection. International Journal of Scientific Engineering and Applied Science (IJSEAS) – Volume-2,

[6]R Giridhar Balakrishna, P. Y. (2017). IoT based Power Theft Detection. IJIET

[7] Rhea Prakash, E. A. (2017). Power Theft Identification Using GSM Technology. International Journal of Advanced Research in Electrical, Vol. 6,

[8] Sagar Patil, G. P. (2013). ELECTRICAL POWER THEFT DETECTION AND WIRELESS METER READING. International Journal of Innovative Research in Science, Engineering and Technology, vol.2,