

Electrical Power Theft Intimation Over SMS

Pruthviraj P. Patil¹, Dr. B. T. Salokhe² and A.S. Mali³

¹M. E. Student, Department of Electronic Engineering, Tatyasaheb Kore Institute of Engineering & Technology, Warananagar, Maharashtra, INDIA

²Professor, Department of Electronic Engineering, Tatyasaheb Kore Institute of Engineering & Technology, Warananagar, Maharashtra, INDIA

³Assistant Professor, Department of Electronic Engineering, Tatyasaheb Kore Institute of Engineering & Technology, Warananagar, Maharashtra, INDIA

¹Corresponding Author: raj7093@gmail.com

ABSTRACT

Theft Intimations based Electricity Theft Identification system. This project will not only useful to electricity theft, and but also calculating the fare, and using the prepaid card for transfer the SMS to the centre observer system. If suppose we implement the project for a complete network in an area, that will be consuming very huge amount and it may calculate the energy transmission and energy consumption. By using the above two values we can calculate the transmission loses we are going to implement monitor with wireless transmission for single house. Wireless data transmission and receiving technique is used. Existing system is not able to identify the exact location of tapping. This system actually finds out on which electrical line there is a tapping and also it will determine transmission line faults.

Keywords--- Electrical Current Theft, Wireless Data Transmission and Receiving, Unauthorized Tapping

I. INTRODUCTION

Generation, transmission and distribution of electrical energy involve many operational losses. Whereas, losses implicated in generation can be technically defined, but transmission and distribution losses cannot be precisely quantified with the sending end information. This illustrates the involvement of nontechnical parameter in transmission and distribution of electricity. Overall technical losses occur naturally and are caused because of current dissipation in transmission lines, transformers, and other current system components.

Technical losses in T&D are computed with the information about total load and the total energy bill. While technology in on the raising slopes, we should also note the increasing immoral activities. With a technical view, Current Theft is a non-ignorable crime and at the

same time it directly affected the economy of a nation. Electricity theft a social evil, so it has to be completely eliminated. Current consumption and losses have to be closely monitored so that the generated current is utilized in a most efficient manner. The system prevents the illegal usage of electricity. At this point of technological development the problem of illegal usage of electricity can be solved electronically without any human control. The implementation of this system will save large amount of electricity, and there by electricity will be available for more number of consumer then earlier, in highly populated country such as INDIA.

II. OBJECTIVES

- This system would provide a simple way to detect an electrical current theft without any human interface.
- It would indicate exact zone and distribution line on which unauthorized tapping is done in real time.
- It would be time saving if distribution company personnel take reading by this wireless technique. It would provide a digital record in case of any judicial dispute.
- To maximize the profit margin of current utility company.

III. PROPOSED SYSTEM

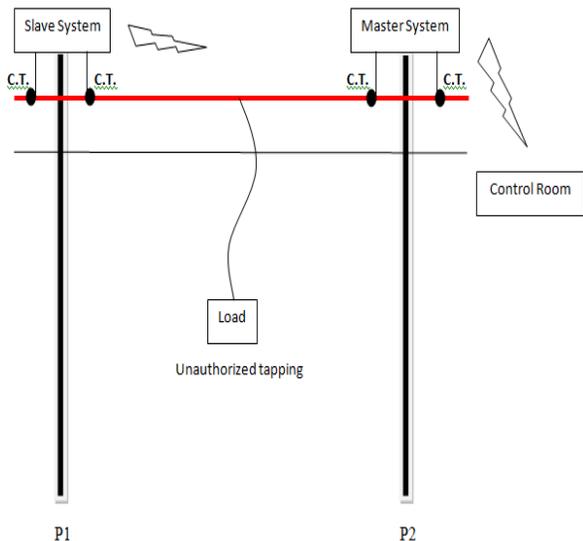


Figure 1. Conceptual Diagram of System

The project takes an attempt to develop an iterative computation method for predicting the dynamics of theft intimation of Electrical power over SMS. This project deals about one of the efficient methods to intimate theft of Electrical power. The fundamental process in this system is obtaining theft intimation using current sensors, microcontroller for data processing and transmitting the data via GSM network to the central control unit and information analysis and to take appropriate decision [2].

This system has divided in to two parts. One part is called the “Slave system” and the other part is called the “Master system”. In the actual system there will be many slave systems in a particular area but a single Master system that will control all the slaves. All the systems will be mounted on each of the electricity distribution pole. The master stem will be located at the central pole and slaves will be on the surrounding poles [3].

The purpose of the slave is to monitor the current flow on the transmission line for that particular pole; the system uses the current sensors for this. It will measure the current flow on the transmission line in two parts, one is incoming current to the pole and the other is outgoing current from the pole. Both the currents values may be different as there may be an authorized electrical connection going to a consumer from that pole. Another task of the slave is to transmit those current values to the Master system over a wireless RF link. For this purpose the system is going to use 2.4 GHz RF trans-receiver modules [4].

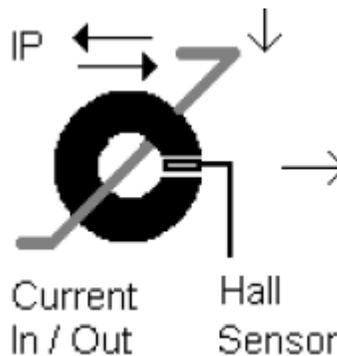


Figure 2. Working of C.T.

The master system will also measure the incoming and outgoing current on the master pole. It will also collect the current values coming from all the slaves over the RF links. The master system will arrange all those current values in a sequence in which the actually current flows through each of the current sensors. The main task of the master is to find out difference between outgoing current of each pole and the incoming current consecutively next pole. Like this it will detect the leakage/theft of the power in the transmission line. A sim300 based GSM modem can be used to send the message to the area supervisor of that particular area using the SMS system, and another message can be sent to the higher authority to avoid corruption at lower levels also.

IV. BLOCK DIAGRAMS

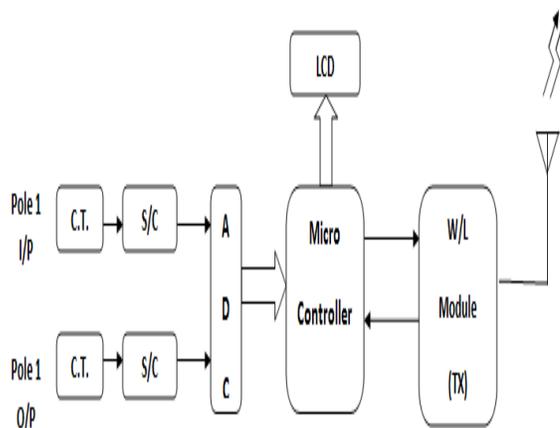


Figure 3. Slave Pole System

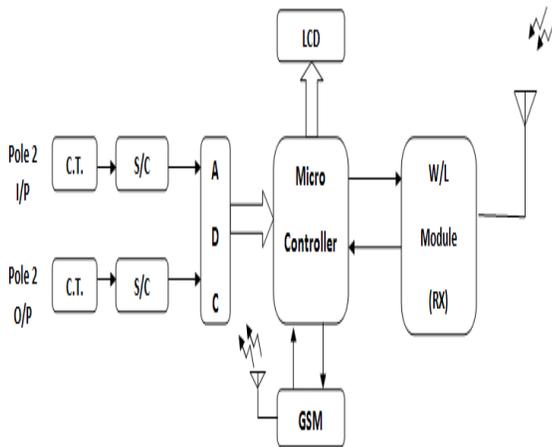


Figure 4. Master Pole System

Where, C.T.= Current Transducer Sensor & S/C = Signal Conditioning Ckt.

V. TRANSMISSION OF DATA

If a signal from C.T.s are i.e. incoming & outgoing current are compared by the microcontroller program. Same then no unauthorized tapping is detected. And if incoming current is not equal to outgoing current then there possibility of unauthorized tapping is done.

So if unauthorized tapping is done then the SMS is automatically sent to the central observing centre with the exact location of theft. The screen shot of received SMS shown below.

Mathematical Model

Whenever current is passing from current transfer pole1 C.T. same time current is passing from current transfer pole 2 C.T. is not same reading then there is possibility of theft of energy.

Current at C.T.1= Current at C.T.2 + Loss.....(no theft)
 Current at C.T.1 ≠ Current at C.T.2 + Loss.....(theft occur)

VI. RESULTS OF SYSTEM

1. Our system detects current theft between pole number 1&2 and send SMS as 1st SMS in snapshot.
2. Our system detect line to line fault line to ground fault & send SMS as 3rd SMS in snapshot.
3. This system detects also accidental prevention.

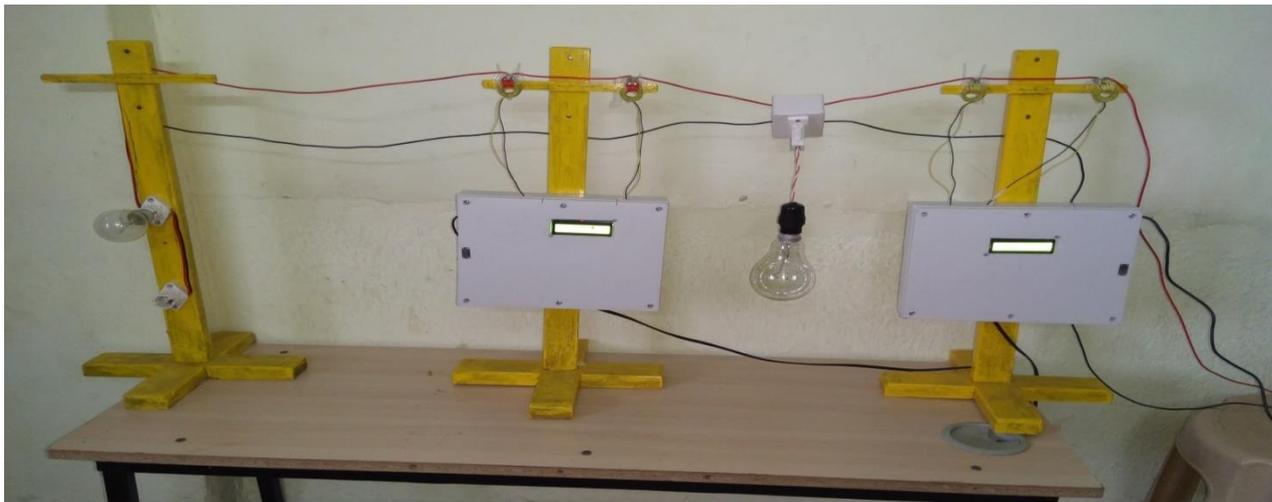


Figure 5 Experimental setup



Figure 6 SMS received at C.O.C.

VII. MODIFICATION

- In power line communication data signal is modulated on power signal and sent it through a same electrical distribution network.
- This will reduce the cost for separate communication line. Can decide the resolution of this system. Due to economic consideration, instead of installing this system for each consumer utility company can install one system for one colony. Then power theft on any line in that colony will be identified by this system.
- System will not get affected by lightning problem in rainy season.
- Also works with reverse current.
- Stands stable with current fluctuations.
- Not get affected with momentary accidents.

VIII. CONCLUSION

The progress in technology about electrical distribution network is a non-stop process. New things and new technology are being invented. The proposed system is an automated system of theft detection. It saves time as well as help to maximize profit margin for utility company working in electrical distribution network. Utility company can keep a constant eye on its costumer.

REFERENCES

[1] Saurabh M. Jain & A.M. Karandiakr. (2016). A Survey on Power Theft Detection. *International Journal of*

Innovative Research in computer and communication engineering, 4(1), 509-511.

[2] M.V.N.R.P. kumar, Ashutosh Kumar, A.V. Athalekar, P.G. Desai, & M.P. Nanaware. (2015, May). Electrical power line theft detection. *International Journal of Research in Advent Technology*, 3(5), 2321-9637.

[3] Dr. Pramod Sharma, Himanshu gupta, Megha sharma, Rohit singh, Ashish Khan. (2016, April). Wireless electricity theft detection and monitoring. *International Journal of Advanced Research in Electronics and Communication Engineering*, 5(4), 994-998.

[4] RM Mutupe, SO Osuri, MJ Lencwe, & SP Daniel Chowdhury. (2017). *Electricity theft detection system with RF communication between distribution and customer usage*. IEEE PES-IAS Power Africa, 566-571. Available at:

<https://zapdf.com/electricity-theft-detection-system-with-rf-communication-bet.html>

[5] Neha Gaur, & Priyanka Gaur. (2012). Automation in power distribution system: Present status. *Journal of Engineering Research and Studies*, 3(2), 82-84.

[6] Virendra Pandey, Simrat Singh Gill, & Amit Sharma. (2014). Wireless Electricity Theft Detection System Using Zigbee Technology. *International Journal on Recent and Innovation Trends in Computing and communication*, 1(4), 364-367.