



# International Journal of Innovative Research in Computer and Communication Engineering

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## Electricity Theft Detection Using Zigbee Technology

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**ABSTRACT:** In this paper, electricity theft detection can be recognized with the help of current division phenomenon and analogue value of current from transmitting pole to the receiving pole is send wirelessly with the help of the zigbee technology. The value of the current through the transmitting line and the current from the zigbee can be compared with the help of the controller.

**KEYWORDS:** Zigbee module, controller, current sensor.

### I. INTRODUCTION

Now a day's electricity is the basic need of the human being. In the every field electricity is required. The Government is facing the problem related to the electricity theft. The total amount of the production of the electricity 30% loss of electricity is occurred in India. So it affects the economical growth of the nation. Electricity theft occurs with the different ways; here focus is on the theft occurred in the remote and rural area where the lot of electricity is bypassed during the night times.e.g. Farm, etc.

### II. LITERATURE SURVEY

In the paper [1] the prepared metering system is formed by using the ARM 7 with the help of GSM module. [2] different sensors with there working are used for the power theft detection.[3] Automatic reading of the meter using the computer coding to have a proper calculation of the electricity used.[4]the reading of the meter can be send through the zigbee, the communication is without the man power. [5] During the installation of the system lot of problem is going to face in case of the wired system. Also it is difficult in the rural areas to install this system. Zigbee is a low cost than the GSM modem. [6] Many times, tampered meter problem is occurred. So it is necessary to have a proper meter setting. The automatic billing is solution in this paper. [7] Here rubber coated aluminium wire is used to ban the theft. Theft is also occurred due to the illegal customers using the cooking heater, water heater, freeze, washing machine; tube light, CFL, etc. It generates the problems like low voltage, voltage dips problem generates heavy harmonics.[8] It is a protocol for the using a electricity and the online payment of the used electricity.[9] in this concept of smart meter is used to measure the reading and sending message to the particular customer.[10]It is a online billing concept where the a group of the customers are made and according to the group of the customer utilization of the power can be compared with the total bill of electricity.[11] There are problem related to the GSM modem related to the cost and the low battery life ,so to overcome these problems Zigbee module is used which is having the low coma comparative to the GSM and the long life.[12] sensors are distributed among the area and sensors are providing the information continuously to the central node which is calculating the total electricity consumed[13] providing the particular locations for the customers to purchase the electricity. It is operate in the online and offline mode

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## III. METHODOLOGY

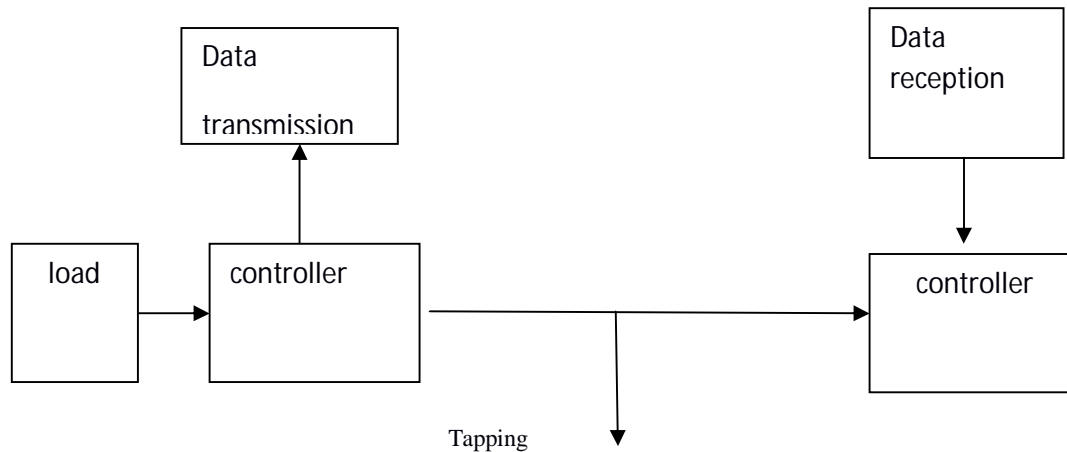
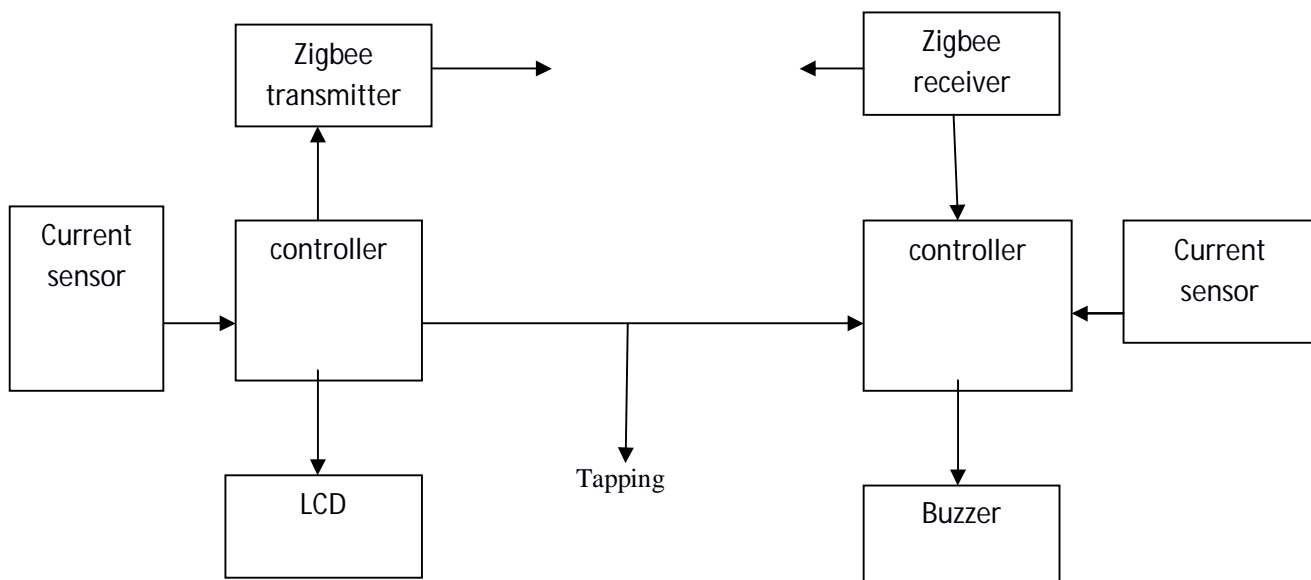


Fig. (1)

Here consider pole based system is used for the providing the electricity to the customer, so to know the amount of current supplied from one pole to the next pole is necessary. Consider the following block diagram .To measure the analogue value of the current sensor is used. As shown in figure below, the current flowing through the transmitting line is measured with the help of current sensor which is interfaced with the controller. Controller is sending this value to the zigbee. Zigbee transmitter wirelessly send this value of the current to the zigbee receiver wirelessly .Also the current through the transmitting line can be measured by current sensor II.



Now the value of current measured through sensor II and the value which is received by zigbee receiver are compared by the inbuilt comparator of the controller. If there is no difference among the two values of the current then there is no bypassing of the current occurred i.e. no electricity theft occurred so the LCD will display “no theft”. If there is a difference between the current value through zigbee and the transmitting line then there will be electricity tampered. The LCD will display “electricity theft occurred” and the buzzer will on.



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Current sensor:

To measure the current passing through the transmission line current sensor is used. It will measure the analogue value of the current and send to the controller. The current measuring is the main important task in this project. According to the current division rule the theft can be detected.

Zigbee Module:

Zigbee is the device which is used to transfer the data wirelessly. Here the current value determined by the current sensor can be transferred to the zigbee receiver from the zigbee transmitter wirelessly.

Zigbee is having low cost device than the Bluetooth or any data transmitter device. Range of zigbee is up to 2 to 3 km. So it is convenient to use the zigbee. Also zigbee can be used for the low data rate transmission which requires the long battery life.

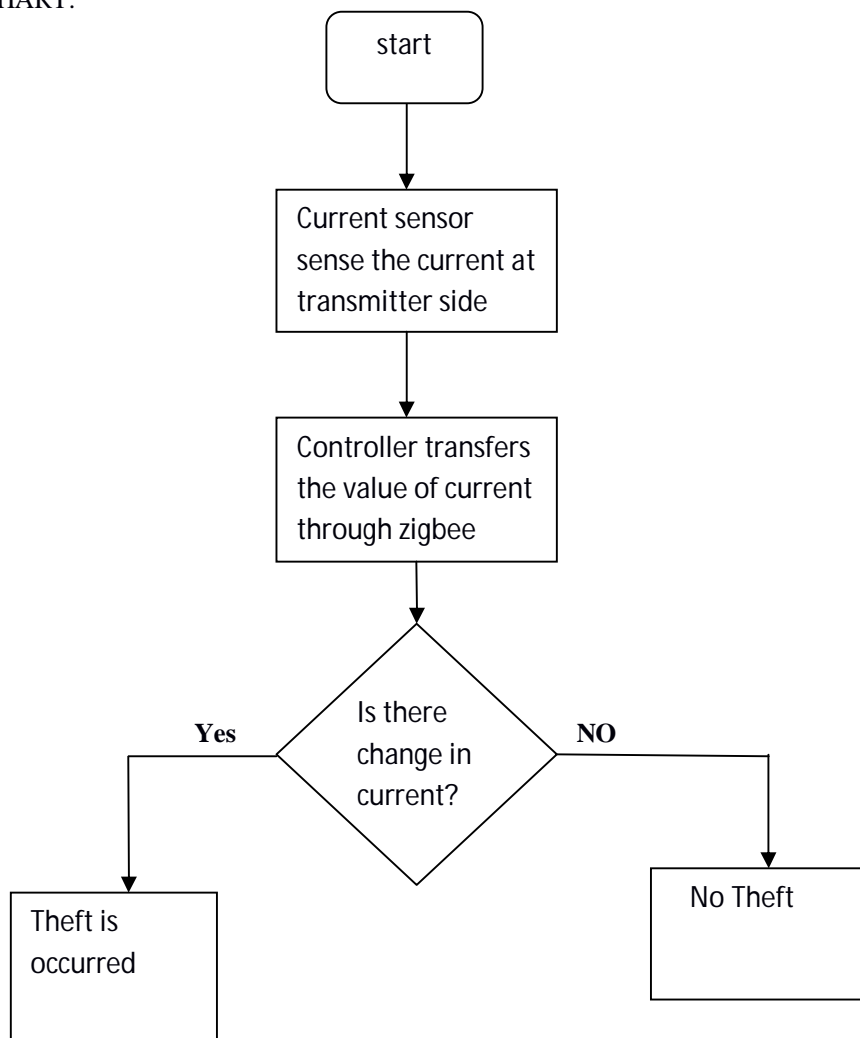
Controller:

Arduino is used as a controlling purpose. As zigbee is compatible with the arduino, it is easy to interface the zigbee with the arduino.

LCD: To display the result of the current value compared by the comparator LCD display is used.

Buzzer: To indicate the theft of electricity occurred buzzer is used.

FLOWCHART:





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## IV. RESULT

By the current division concept if the electricity is bypassed in-between the two poles then the value of the total current get changed. The important value of the current which is transmitted by the zigbee transmitter to the zigbee receiver and the value of the current measured by the current sensor at the second pole .If there is a difference in those two values then we can determine that electricity theft is occurred.

## V. CONCLUSION

The Power theft is an economic problem that adversely affects all customers. Utilities estimate that 0.5 to 1.0percent of all customers steal from them and that their annual losses exceeds. Power Theft is a non ignorable crime that is highly prevented. Thus in this paper we try to detect power theft and controlling it.

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