

Power theft detection and control system using internet of things(IOT)

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ABSTRACT:

Power theft detection and control system using Internet of Things present on efficient and less costly way to transfer the power consumed by the consumer. Used to overcome the theft of electricity which can be done using excess amount of power beyond the limit of meter. in this paper, main purpose is to monitor the power consumed by the organization such as household consumers, various industries etc. Detection and control of power has been done by calculating the power consumed by the user at a given time with the help of meter Electricity meter. consists theft detection unit and the theft detected will be notification. Due to to this customer continue using the excess power then electricity board section will cut the power supply of the consumer. IOT operation can be performed by Wi-Fi device which sending meter data to the web page through IP address, so that electricity board section continuously monitor the consumption.

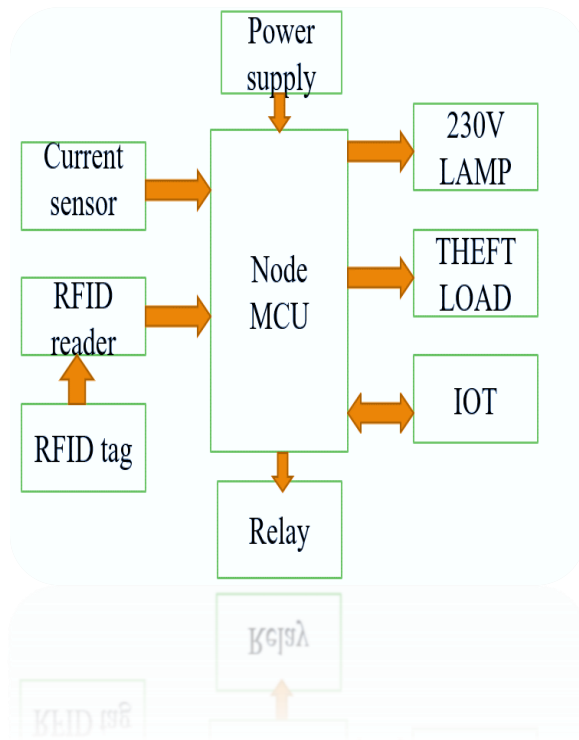
Keywords; Internet of things, detection, electricity theft, IP address

1. INTRODUCTION

Power utilities lose large amounts of money each year due to fraud by electricity consumers. Electricity fraud can be define as a dishonest or illegal use of electricity equipment. Realistically, electricity utilizes will never be able to eliminate fraud. It is possible, however to take measures to detect, prevent and reduces fraud. Investigation and under taken by electric utility companies to assess the impact of technical losses in generation, transmission and distribution networks. Energy monitoring cannot be done efficiently mainly because consumers are not aware of their energy consumption. The installed capacity of the electricity sector in india is 329.23 giga watts as of august 2017 which includes renewable and non renewable sources. The per capita electricity consumption in India in 2016-2017 was 1,122 kWh. The IOT has recently become universal to highlight the vision of a global structure of interconnected physical objects. As more number of electricity-consuming products coming into daily lives, such as electrical vehicles (EVs) and advanced heating, ventilation, and air conditioning systems, load demand increases dramatically and power required at high amount. So in this paper proposed an power theft detection system to detect the theft which is made by the most common way of doing the theft and that is by using excess power beyond the limit of

meter. At this point of technological development the problem of illegal usage of electricity can be solved electronically without any human control along with that meters are connected to the internet using IOT concept.

2. BLOCK DIAGRAM



A radio frequency identification tag (RFID tag) is an electronic tag that exchange data with a RFID reader through radio waves. Most RFID tags are made up of at least two main parts. the first is an antenna, which receives radio frequency (RF) waves. The second is an integrated circuit (IC), which is used for processing and storing data the radio waves received/sent by an antenna. A radio frequency identification reader (RFID reader) is a device used together information from an RFID tag, which used to track individual objects. Radio waves are used to transfer data from the tag to a reader. Then current sensor senses the abnormal current. That the signal is sent to Node MCU there are one normal load and one theft load. so the theft load on message will be received through IOT. there are immediate action takes place.

3. EXISTING SYSTEM

- There is no any device to send the information
- The man power is required

- In this method user cannot manage the power consumption
- Theft caused by excess amount of power
- Theft intimation is not possible

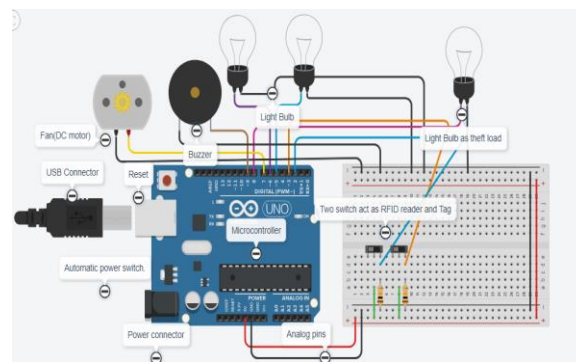
4. PROPOSED SYSTEM

In this paper using sensor the power system is monitoring to present data is sent via IOT.

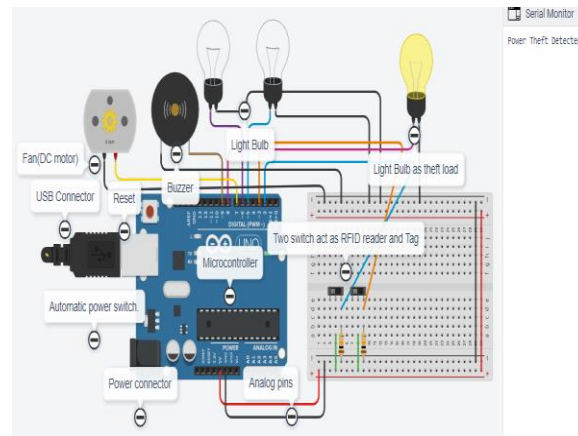
Advantages of proposed system

- 1.To find the extract location
- 2.No man power are needed
- 3.Theft will be intimated
- 4.To cut the power at location

V.SIMULATION RESULT



Simulation diagram



Simulation result

5. HARDWARE DESCRIPTION

The concept of Internet of Things (IOT) from its initial stage changing the current Internet into well featured upcoming internet. At present there are billions of gadgets (approximately nine billions) interconnected gadgets and one prediction is that it will reach up-to fifty billions gadgets in 2020. The IOT based smart energy comprises mainly 4 modules (units). 1. Node Mcu unit 2. Theft detection unit 3. Wi-Fi unit

RFID:



Fig.1 RFID tag and reader

Radio frequency identification(RFID) uses electromagnetic field to automatically identify and track tags attached to objects. The tags contain electronically stored information. passive tags collect energy from a nearby RFID readers interrogating radio waves. Active tags have a local power source (battery) and may operate hundreds of meter from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader so it may be embedded in the tracked object.RFID is one method of automatic

identification and data capture(AIDC).RFID tags are used in industries. For example, an RFID tag attached to an automobile during production can be used to track its progress through the assemblyline RFID tagged pharmaceuticals can be tracked through warehouses.

NODE MCU

Node MCU is a open source IOT platform. It includes firmware by which runs out on the WI-Fi and the hardware is based on the ESP-12 module. The term “NODEMCU” by default refers to the firmware rather than the development kits. The firmware uses lua scripting language Node MCU:



Fig.2 Front side surface of Node MCU



Fig.3 Bottom side surface of Node MCU

RELAY:

A relay is a switching device as it works to isolate or change the state of an electric circuit from one state to another. Different Types of Relays. Classification or the types of relays depend on the function for which they are used. A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays.

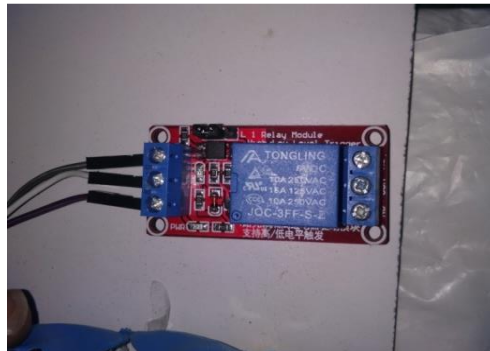


Fig.4 Relay diagram

Hardware kit:

This hardware kit was easy to designed of power theft concept.



Fig.5 hardware kit

CONCLUSION

IOT based Power theft detection and control systems where proposed in this paper. The system would provide a simple way to detect an electrical power theft without any human interface. In this system we are looking forward to implement smart meter. As the Indian Government has also proposed formation of Smart Cities which will have a effective energy management, transportation, waste disposal and resource conservation strategy using primarily Internet of Things based sensors as done globally.

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