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An IOT-Based Power Antitheft System for Governing of Energy Meters

[1]Daryaraj Makhare, [2]Prof. Rajashri Patil

[1]Student, M.E., Electrical Power System, Zeal college of Engineering and Research, Pune, Maharashtra, India

[2]Professor, M.E., Electrical Power System, Zeal college of Engineering and Research, Pune, Maharashtra, India

***Abstract* - In the agricultural countries, the endeavor of get-together power utilization and perceiving unlawful use of force is a problematic and monotonous endeavor which requires plentiful HR. The organization of savvy home framework is weak against robbery. The objectives of undertaking are the proportion of energy being used by the business. Industry, home, emergency clinic and so forth similarly as giving idea through IOT. The expectation is to evaluate power use in the nuclear family and produce its bill normally using IoT. With the approach of brilliant framework advances, shrewd meters with Information Communication Technology (ICT) can give an answer for recognizing and alarming the power burglary. This task presents the use of Internet of Things (IoT) in power burglary identification and ongoing savvy meter checking. Straight Regression strategy is utilized for recognizing power burglary by constantly observing the purchaser and dissemination end brilliant meters information. Android applications are produced for checking utilization and charging data of purchasers and cautioning the experts in case of burglary. The introduced framework is equipped for recognizing power burglary because of meter sidestep, meter altering and direct line snaring.**

Keywords: Internet of Things, IoT, smart meter, Android applications, Information Communication Technology, ICT.

I. INTRODUCTION

Internet of Things term was first composed by Kevin Ashton in 1999. Internet of Things is the network of physical devices embedded with the electronics, Software, Sensors, Activators and network connectivity with the objective of exchange data or collects the data. The IoT enables the articles to be detected or controlled remotely crosswise over existing system framework making the direct integration of physical world into PC based framework. The Internet of Things (IoT) includes frameworks of sensors joined to articles and concentrated contraptions, giving data that can be poor down and used to begin motorized exercises.

The properties of this web of things may be depicted by low imperativeness usage, auto-setup, embeddable articles, et cetera. The data similarly makes basic learning for organizing, organization, plan, and essential authority. Today the world is confronting such a situation, to the point that offers challenges. The energy crisis is the fundamental issue confronted by our general public.

A pertinent framework to control and screen the power utilization is one of the answers for this issue. One approach through which today's energy crisis can be tended to is through the diminishment of energy utilization in family units. The Consumers are expanding quickly and furthermore, trouble on power offering divisions is strongly increasing. The Consumers must be encouraged by giving them a perfect arrangement: - i.e. the idea of IoT (Internet of Things) meters and then again specialist co-op end can also be educated about power robberies utilizing Theft detection unit and Arduino.

II. METHODOLOGY

Power misfortune is one of the significant issues that must be taken consideration in the appropriation organization. It very well may be tended to as the distinction in power, between the age and metered utilization. This power misfortune is ordered into specialized misfortunes and non-specialized misfortunes. Larger part of the power misfortune is nontechnical misfortunes and are because of influence robbery. Power burglary can be characterized as the unlawful or un-metered usage of power from circulation utilities.

The circulation utilities are at present confronting gigantic monetary misfortunes because of this influence burglary. It has been assessed that around 6-10 billion INR of income will be lost in India in light of the burglary consistently. Buyers commit power robbery in different ways which incorporate meter bypassing, direct line snaring, meter altering and so forth. Web of Things (IoT) gives the high level correspondence advances through which the shopper usage data can be shipped off the focal server.

By using every buyers data alongside conveyance transformer data, any kind of force robbery can be recognized and alert the concerned specialists at circulation transformer level.

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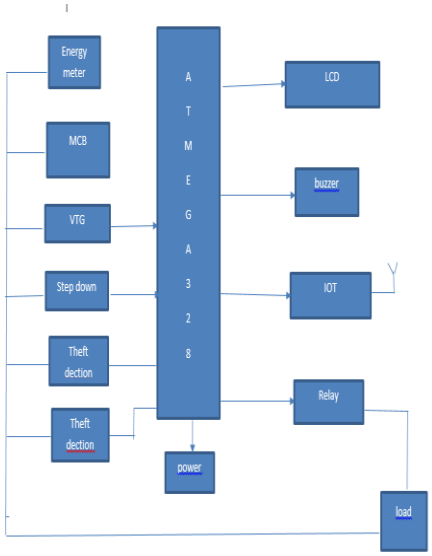


Figure 1: Block Diagram

Block diagram presents the client server model based architecture of the proposed system. It consists of three layers namely device layer, client layer and server layer. The smart meters at different nodes form a device layer. The LED sign is utilized to evaluate the office that is being exhausted. This LED squints using the electrical inspiration that rises when force is consumed. This drive is given as commitment to the Optocoupler IC .The yield of the IC is given on the grounds that the commitment to the automated pin of microcontroller. With the assistance of a counter, the quantity of main thrusts might be resolved and hereafter the proportion of vitality exhausted might be evaluated. The beat from the meter is utilized to interface it with the microcontroller. Further, the deferral between the beat is utilized to work the charge per unit. After each cycle, the imperativeness meter glimmers the LED only once. Thusly, if a 100 watt bulb is utilized for a blaze, around then the beat will glimmer on numerous occasions during a minute. If the theft or power theft is detected will be alerted to the IOT using system through wireless communication. The base impedance of the system must be given for choosing the LCL filter parameters in order to avoid resonance, voltage drop and reactive power problems.

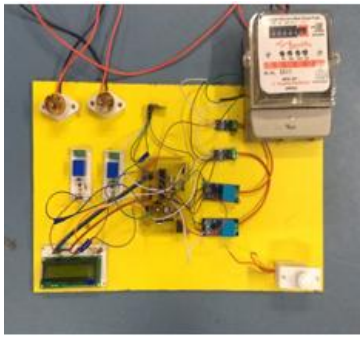
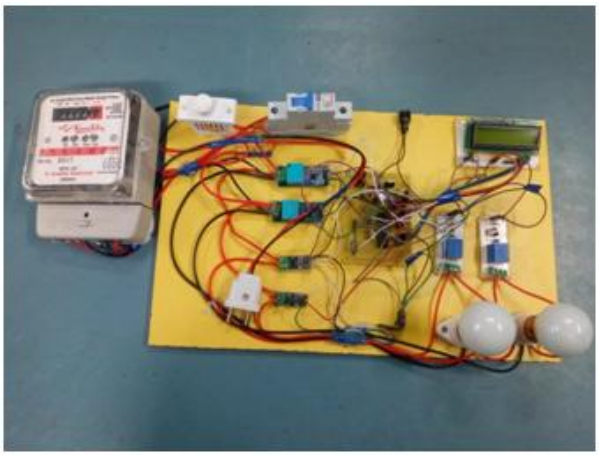


Figure 2: Hardware Prototype

III. RESULTS AND CONCLUSION

IOT based Power theft detection and control systems were proposed in this project. 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.



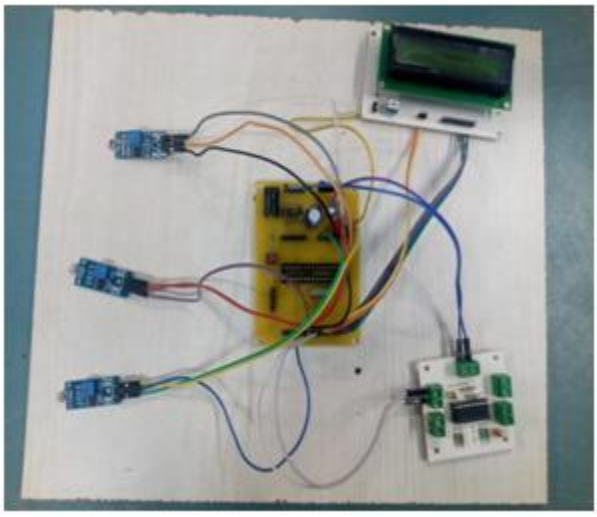


Figure 3: Hardware Results

Simulation results are presented and discussed to show the effectiveness of the proposed drive system based on Arduino based automatic power theft detection and prevention from distribution line. For studying the performances of proposed system, a series of simulations and measurements have been carried out. In this respect, the dynamic response of the propose current estimation algorithm is studied under different condition. As shown in Figure 3 Arduino based automatic power theft detection technique for electricity is proposed. In electricity metering system, tampering is done basically for the

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purpose of electricity theft. To protect the electricity energy meter from this theft, attempt a relay is used at the opening of the meter. The relay is connected to interrupt pin of the driver. Hence closed switch applies 12V to the interrupt pin and opened relay drives the voltage to zero.

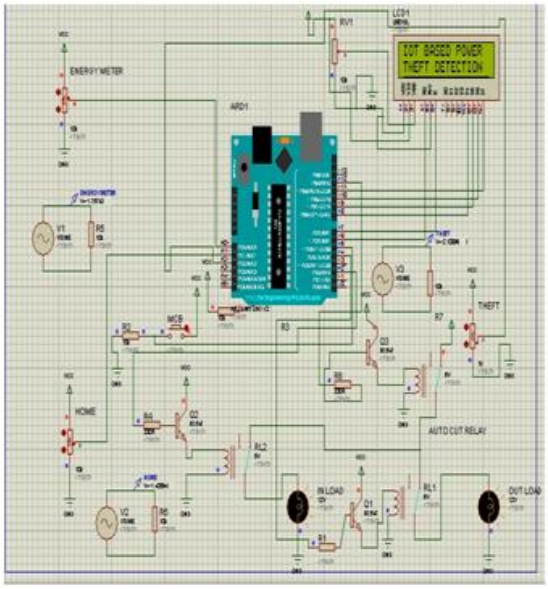

Figure 4: Circuit Diagram

The relay normally closed when the meter chassis is closed. If someone tries to open or tamper with electricity energy meter, that switch gets opened, and the interrupt pin gets triggered as 0V is sensed by it. The Arduino immediately sends to module for sending SMS. Upon receiving SMS, the authority can take further legal action against it and penalize the theft person as shown in Figure 4 Thus simulation result shown in Figures 3 and 4 indicate that sensing value of current, voltage and amount of power that customer used and payment /revenue/ of the consumed power. In thus simulation there is no theft which exist on the distribution line due to that green LED indicator is become bright and there is no need power interruption on the line.

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