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ELECTRICITY THEFT DETECTION & CONTROL SYSTEM

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ABSTRACT

This paper deals with automatic meter reading and theft control system in energy meter. Energy meter is used to measure the total power consumption for house or industrial purpose. This recorded reading is transmitted to the electricity board. For transmitting the reading of energy meter GSM module is used. To avoid theft detection some technique is used i.e. when the reading of user A and reading of user B is equal to the reading of main meter then there is no thefting but when the reading are not match so there is thefting of electricity then the connection of main meter is automatically turn off using the relay. The measuring of energy meter and monitoring of IR sensor is done with Arduino Uno. The informative system will be helpful for the electricity board to monitor the entire supply and the correct billing accordingly without any mishap. This model reduces the manual manipulation work and theft control.

Keyword:- LDR Sensor, Relay, Energy meter, GSM Module, Arduinouno, LCD, Buzzer,

I. INTRODUCTION

Electricity plays a vital role in growth of our country.Eventhough power productioncorporations focusing highly on generation, transmission and distribution, they are meeting power loss due to illegal consumption of electrical power from the transmission lines by the consumers. Power theft has become a great challenge to the electricity board. The dailies report says that Electricity Board suffers a total loss of 8 % in revenue due to power theft every year, which has to be controlled.

This project identifies the power theft and indicates it to the Electricity board through GSM network. It also deals about the remote monitoring of an energy meter in the proposed system. This system enables the Electricity Department to read the meter readings regularly without the person visiting each house. This can be achieved by the use of Microcontroller (Arduino Uno) unit that continuously monitors the reading on LCD Display also records the Energy Meter readings in its permanent (non-volatile) memory location. This system also makes use of a GSM modem for remote monitoring and control of Energy Meter. The Microcontroller (Arduino Uno) based system continuously records the readings and the live meter reading can be sent to the Electricity department on request.

II.RELATED WORK

H. G. Rodney Tan ,C.H. Lee,V.H.Mok, "Automatic Power Meter Reading System Using GSM Network".

This complete system is made up of GSM power meter (GPM). The system work corresponding with GSM to retrieve the power meter reading using SMS. The GPM is consist of single phase standard IEC61036 compliance Power Meter with GSM module. A SIM card with unique special number required to GPM to receive and reply the meter reading to energy Provider by using SMS. The unique SIM works similar to mobile phone except for voice services, and used for identify and retrieve the owner detail for energy provider from server database for billing purpose. Automatic power reading is performed by request upon power provider for monthly period. upon the meter reading execution SMS gateway perform cell broadcasting request by SMS to all GPM to request for meter reading. Once the each individual GSM power meter received the requesting SMS it responds with composing its consumption reading in six digit format with one decimal point in SMS format and revert it to SMS provider gateway. The SMS gateway stars receiving reply meter reading from all meter and stores accordingly them and then starts to update the server database and then e-billing system starts calculating billing amount for each individual meter by the tariff rate provided by power provider. And later then billing amount is sent to consumer by SMS.

Dr. Khalid H. Qamar, Engr. MazharIqbal, Hassan Qayyum, M. ShahanQadri, M. Hammad,"GSM based Automatic Energy Meter Reading".

This paper represent the system which measures the power consumption by IR sensor which basically act as transmitter whose data is collected by receiver called Photodiode. the disc place between them on rotor through which it will rotate. The disc has tiny holes on outer edge. the microcontroller finds the number of rotation made by disc with the help of IR sensor, rotation made by disc is nothing but power consumed by load. After getting energy consumption the microcontroller calculates the units for specific user, the unit is numeric form. The system can send energy consumption in hourly or monthly basis to power provider through SMS.

Mr.Ashna.k and Mr.Sudhish N George, "GSM Based Automatic Energy Meter Reading System with Instant Billing".

This paper presents the design of a simple low cost wireless GSM energy meter and its associated web interface, for automating billing and managing the collected data globally. The proposed system replaces traditional meter reading methods and enables remote access of existing energy meter by the energy provider. Also they can monitor the meter readings regularly without the person visiting each house. A GSM based wireless communication module is integrated with electronic energy meter of each entity to have remote access over the usage of electricity. A PC with a GSM receiver at the other end, which contains the database acts as the billing point. Live meter reading from the GSM enabled energy meter is sent back to this billing point periodically and these details are updated in a central database.

III. PROBLEM FORMULATION

3.1 PROBLEM IN CURRENT SYSTEM

A. The manual operator cannot find the unauthorized connections or malpractices carried out by the consumer to reduce or stop the meter reading/power supply.

B. The human error can open an opportunity for corruption done by the human meter reader.

C. The problem caused billing system due to inaccurate & inefficient reading.

D. Drawback of this process is to collect the readings, going in the particular range of area and manually cut power supply if needed

IV. METHODOLOGY

4.1 Meter Reading Operation

The energy meter which generates the pulses as well as count the energy consumed is used. The digital energy meter is having a LED which blinks for a specific number of times to indicate the energy consumed (e .g. 1 Unit = 1600 pulses). These pulses are counted by the LDR sensor and fed to Arduino based system which is programmed to count these pulses. The system reads these pulses and after counting specific number of pulses it increments the internal counter by one which indicates the number of units consumed. Now, when the service provider sends a message to read the energy meter data, GSM modem, which is interface with the arduino. This causes Arduino to read the number of units burnt and sends the data to output port of arduino. It sends the data to GSM modem which sends this meter reading data to service provider and also to the user.

4.2 Theft Detection Operation

The method includes receiving meter data of the measured power consumed by a customer, receiving delivered power data that includes data of the power delivered to the customer, determining a difference between the meter data and the delivered power data, determining that the difference between the meter data and the delivered power data is greater than a predetermined amount, and indicating a discrepancy if the difference between the meter data and the delivered power data is greater than a predetermined amount. In addition, the method may include determining that a discrepancy varies over time by a predetermined amount and providing a discrepancy notification through power lines.

V.CONCLUSION

This project model reduces the manual manipulation work and theft in electrical transmission system. In this model we are using GSM for fast processing as well as it provides the numerous advantages of wireless network systems. The government saves money by the controlling theft in energy meter it is also beneficial for customer side as well as government side. The metering IC ensure the accurate and reliable measurement of power consumed by user. It has low cost compared to other energy meters which does not provide Automatic reading or theft control.

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