

Power Theft Detection Using Gsm Module

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Abstract : This paper introduces a discovery of energy theft in every house and in trade for varied ways for theft. voltage is crucial for normal day to day existence and spine for the business. Power is undiscipline to our daily existence with increasing want of power the ability theft is likewise increasing, management theft is a difficulty that keeps on plaguing power section crosswise over entire nation the goal of this endeavor is to stipulate such a framework which is able to plan to reduce the illicit utilization of power and moreover decrease the percentages of theft. This task can naturally acknowledge the theft. This model decreases manual management work and plan to accomplish theft management.

Keywords: Sim Card Interface, Gsm Module, Current Sensor, LCD Display, Pic16F874A/877A, Alarm Driver Circuit, Relay Driver Circuit, Buzzer, Relay, Meter Line.

I. Introduction

Power thieving is an exceptionally traditional issue in nation, were people is high and also the utilization of power area unit ultimately mammoth. In India, systematically there's very increasing range of power robberies crosswise over home power association and additionally mechanical power offer, that brings concerning loss of power organizations energy and attributable to that we tend to area unit coping with the incessant problems with load shading in urban and additionally provincial regions so as to defeat the necessity of power for entire state. Likewise the ways that utilizing which thieving ought to be attainable area unit innumerable thus we will ne'er monitor however thieving is going on, and this issue is ought to be understood as earlier than schedule as may moderately be expected. during this theoretical we tend to propose an influence thieving identification framework to acknowledge the thieving that may be a created by the foremost well known methodology for doing the thieving which is bypassing the meter utilizing the a trifle of wire, people basically sidesteps electric meter that is tallying the current unit by setting a wire antecedently, then once the actual fact the meter reading unit. once somebody try and power thieving, the projected structure connected to the meter, it'll send sms to manage unit of electricity board. Over the years, the Electricity Companies were using the conventional credit metering and billing system which was much time consuming system. So the scientists started to identify technologies which may become useful and easier for consumers to pay for the services. In the developing countries, electricity theft has raised asa serious problem in power sectors. A great amount of profits lost due to electricity theft. In some countries it has become such a severe problem that the governments are facing losses instead of revenue. Due to this financial loss the shortage of funds occur for investment to expand the existing power capacity and due to which governments become failed to satisfy the ever enhancing demand of electricity.

II. Literature Survey

The power grid has become a necessity in the modern society. Without a stable and reliable power grid, tens of millions of people's daily life will be degraded dramatically. For instance, the India blackout in July 2012 affected more than 60 million people (about 9% of the world population) and plunged 20 of Indian 28 states into darkness. Indeed, the traditional power grid, which is surprisingly still grounded on the design more than 100 years ago, can no longer be suitable for today's society. Electricity theft is a major problem in developing countries which has affected utility as well as consumers.

Ways of electricity theft:

- Tampering with energy meter
- Bypassing electric meter
- Evading payment (non-payment of bills, billing irregularities)

- Magnets, reversing the current direction by changing the terminals were used in analog disc type meter
- Radio frequency devices employed to temper electronic meter
- Intermittent and opportunistic theft by well off
- Illegal customers disconnect neutral from the return path. In such a case energy meter assumes that voltage between live wire and the new neutral is zero which implies total energy consumed is zero.

III. Block Diagram And Description

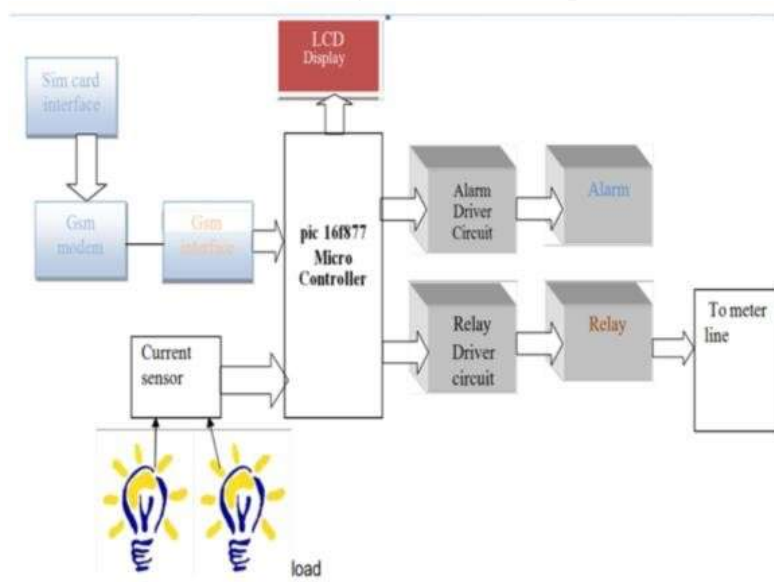


Fig.1

Power supply

The transformer reduces the voltage from mains to 12VAC(RMS).The Diode Bridge (known as a bridge rectifier) will convert 12VAC to 5VDC.The first capacitor will smooth out the ripples that come from the output of the AC to DC bridge rectifier.The [LM7805](#) regulator will maintain a constant voltage as the load varies. For example if you are switching a light bulb on and off, the current will go up and down, and if you didn't have a regulator then the voltage would drop as the bulb is switched on. The regulator keeps it at the 5VDC your microcontroller needs.

Pic16F8774

PIC16F874A/877A devices are available in 40-pin and 44- pin packages. All devices in the PIC16F87XA family share common architecture with the following differences.The PIC16F873A and PIC16F874A have one-half of the total on-chip memory of the PIC16F876A and PIC16F877A. The 28-pin devices have three I/O ports, while the 40/44-pin devices have five.

Piezo buzzer

The piezo buzzer produces sound based on reverse of the piezoelectric effect. These buzzers can be used alert a user of an event corresponding to a switching action, counter signal or sensor input. They are also used in alarm circuits.The buzzer produces a same noisy sound irrespective of the voltage variation applied to it.

Relay Circuit

A relay is an electromagnetic switch which is used to switch High Voltage/Current using Low power circuits. Relay isolates low power circuits from high power circuits. It is activated by energizing a coil wounded on a soft iron core. For detailed working of relay please visit this page. A relay should not be directly connected to a microcontroller, it needs a driving circuit.

Current sensor

A current sensor is a device that detects electric current in a wire, and generates a signal proportional to that current. The generated signal could be analog voltage or current or even a digital output.

Gsm Module

GSM (Global System for Mobile Communications, originally Groupe Spécial Mobile), is a standard developed by the European Telecommunications Standards Institute (ETSI). It was created to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones and is now the default global standard for mobile communications – with over 90% market share, operating in over 219 countries and territories.

LCD Display

The commonly used 16x2 LCD display custom made characters, numbers, alphabets, and special characters. When there is no theft occur in energy meter then the LCD will display voltage current and power. If theft is occurs then it display THEFT IS DETECTED.

IV. Working

The sensor is touched the microcontroller will respond to its high logic and will detect the theft and will display in it the LCD. After detection of the theft comes the part of the coding where the microcontroller uses its TXD Pin and sends the commands serially to the GSM Modem and then the GSM modem sends the SMS to the Mobile no. loaded in the programming section of the project this section remains in the LCD for a while as we have given a delay of 3000ms as GSM takes a bit time while sending the SMS. The message which is sent to the respective mobile no. shows the message as THEFT DETETED and we can program it adding the Consumer ID no. or anything which is relevant we just need to change the program section. As we know that this project is just limited to the tampering of the meter using a sensor and then the SMS is sent to the respective mobile no. we can add a various components like relay circuit to cut off the main line if the theft is detected and we can also read the units that can be sent to the Electricity board and accordingly when a message is sent from the registered mobile no. to the GSM modem i.e. the SIM associated with it we can control the theft we can also use a Current transformer in the pole and then the electricity meter for the theft which is common that is the direct line by hooking the current transformer sends the value and then the comparator checks the value and can sense the theft caused by the hooking technique. There is a lot more we can do to control the theft. Additionally we can add a buzzer too which will make a sound if theft is detected.

V. Conclusion

The simulation is done to find the power theft using proteus simulation software. It can be used for implementing in hardware, which can find accurate details and sends to the electricity board. The load also can be controlled by a single SMS from the registered mobile number. The task show decreases the manual management work and theft. Utilization of GSM in our framework provide the varied points of interest of remote system frameworks. The metering IC guarantee the precise and solid estimation of energy gone. henceforward we try to manage value savvy low once contrasted with alternative energy meter while not programmed meter perusal and thievery control.

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