Wireless Smart WATT-HOUR Meter Reading Cum Electricity Theft Detection System

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ABSTRACT: Electrical power robbery recognition framework is utilized to identify the unapproved tapping in vitality meter. Implementation region of this framework is a close to the vitality meter of electrical power supply network. Existing framework is not ready to recognize the correct area of theft. These frameworks really discover on which local house is abusing the power framework. This is a continuous framework remote information transmission and accepting strategy is utilized. This will give an extra office of remote meter perusing with a similar procedure and in same cost. This proposition frame work will shield circulation arrange from burglary in local zone.

KEYWORDS: Power Theft, Billing System, GSM, Alert, Current Sensor.

I.INTRODUCTION

 Generation, transmission and distribution of electrical energy involve many operational losses. Whereas, losses implicated in generation can be technically defined, but transmission and distribution losses cannot be precisely quantified with the sending end information. This illustrated the involvement of non technical parameter in transmission and distribution of electricity. Overall technical losses occur naturally and are caused because of power dissipation in transmission line, transformers, and other power system components.

Technical losses are computed with the information about total load and the total energy bill. While technology in on the raising slope and also note the increasing immoral activates. With a technical view, Power Theft is a non ignorable crime and at the same time it directly affected the economy of the country. Manual calculation electrical bill has become more illegal and error system now days. At this point of technological development, electrical billing can be made Automatic manner. The implementation of this system will save large amount of electricity and there by electricity will be available for more no of consumer than earlier, in highly populated country such as INDIA.

II. RELATED WORK

This proposal project is in the domestic distribution area of electricity boards has more units of power theft. And till now traditional electro-mechanical meters where used to measure the energy consumption. Here human error is the main disadvantage. So this proposal deals with designing wireless smart watt-hour meter as well as billing system. It is used to detect power theft at the exact domestic location. It provide simple way to detect electrical power theft

without any human interface. And also gives alert to the consumer to pay the bill on time(By SMS), to indicate the power theft occurs in the domestic area.

III. SCOPE OF THE PAPER

It is a difficult job for the electricity board officials to manually find the electricity theft as well as take reading and calculated bill as it is time consuming and required man power. In order to avoid the energy theft we are using current sensor to detect the power theft in domestic area. This project will give a alert message to nearby substation when any unwanted power theft occur in the domestic area. Billing consumer for energy consumption is not uniform. It is tedious job for electricity board official to manually go and take meter reading of all domestic houses. Hence considering these factors it is possible to design an energy theft detection system and smart energy meter. This energy theft detection system consists of current sensor near the distribution pole as well as domestic house which is connected to it. The current sensor in the distributed pole will produce the current value that follow in it. The value which get from all the houses are added together to compare with distributed pole value. These values are compared with some tolerance which includes the distribution losses. When the compared values are not equal, the microcontroller will send the alert sms to substation through GSM module. Smart energy meter which will provide bill to consumer through SMS. The proposed energy meter utilized a GSM module to transfer energy consumed to the authority side (consumer as well as substation).

IV. BLOCK DIAGRAM OF PROPOSAL MODEL

The block diagram below shows the Wireless Smart Watt-Hour Meter reading cum electricity Theft Detection. This block diagram clearly explained about how the power theft has been detected and bill process method. In this microcontroller has been connected with power circuit and GSM transceiver. Current sensors are used to measure the current value from the load as well as from the distributed pole. The microcontroller is design in such a way that it will compare the both value of current sensors and produce the error value. Based on the error value the microcontroller will send the SMS to nearby substation. It also designs to send the consumption bill to the consumer as well as to the nearby substation.
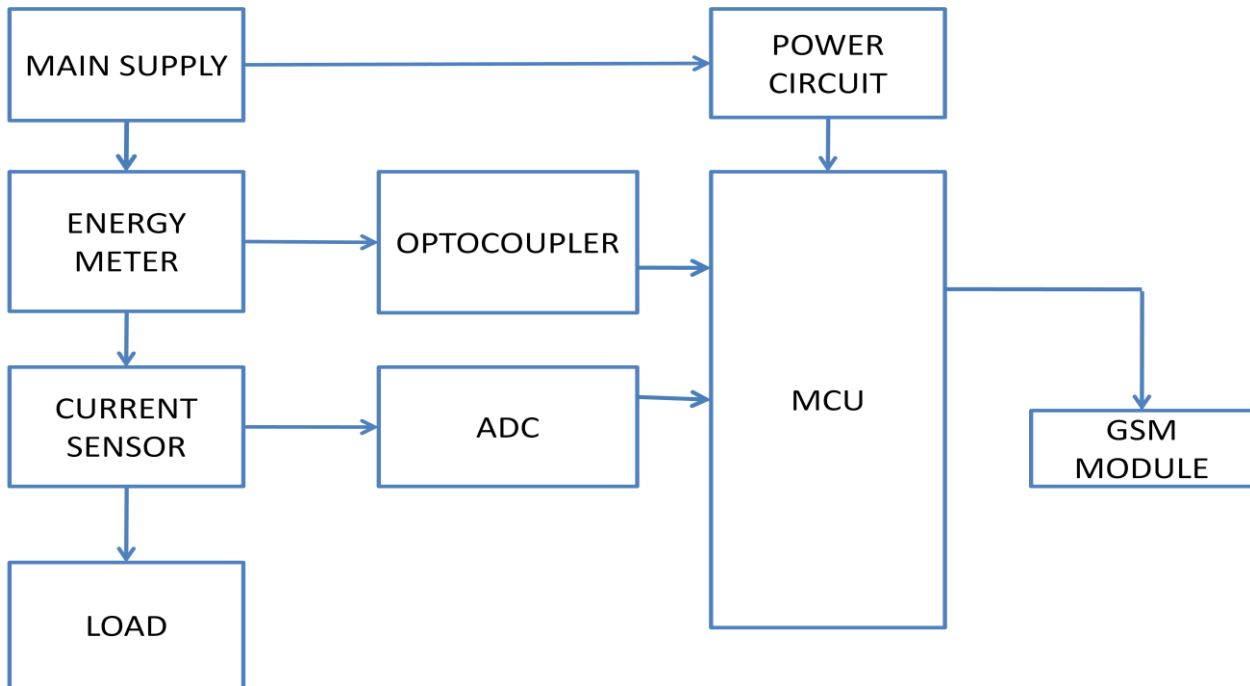
Fig. 1.Block Diagram of Proposal Model

V.FLOW CHART

A.PROPOSAL MODEL

The below flow chart1 shows the general flow method of proposal model of the project. In this model the distributed pole receives the power supply from nearby substation. The distributed pole gets 230V, single phase 50 Hz AC supply. This supply is injected to two different electrical device i.e., one is energy meter where another one is step down transformer (230V to 12V AC supply). The output of step-down transformer is connected to the bridge rectifier to convert AC into DC. The filter and voltage regulator is used to remove the unwanted signal and to provide the pure DC current. The energy meter which has LED connection, is coupled with opto coupler to determine the power consumption. In other side of energy meter a load is connected to it. In between the load and energy meter, a current sensor is connected. The output of current sensor and opto coupler are compared in the Microcontroller unit. This MCU send the message to the consumer and substation based on the error signal generated in it.
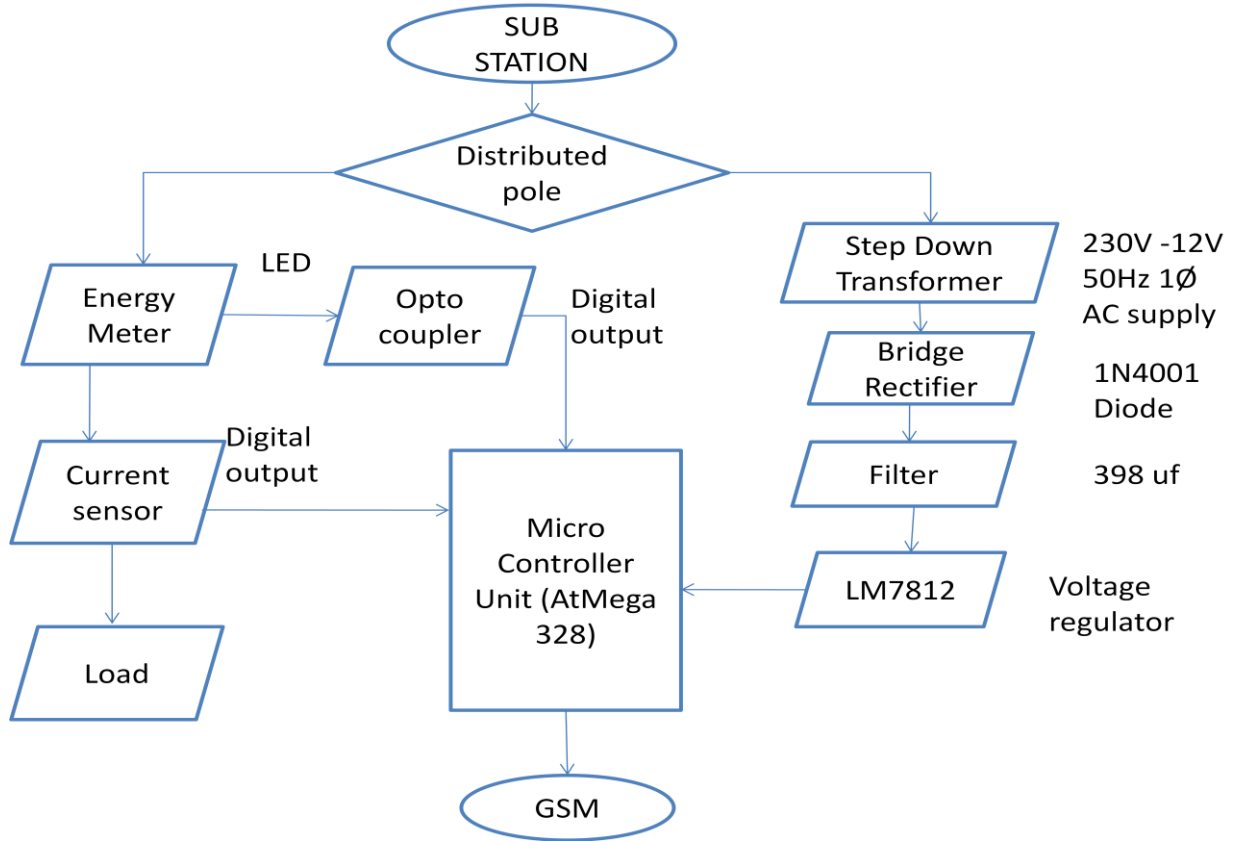
Fig 2 Flow Chart for Proposal Model

VI. PROCESS OF MCU

The two different outputs of current sensor and opto coupler is used to detect the theft and billing purpose. The output of current sensor is used to calculate the power (P1). The output of opto coupler is used to determine the power (P2). It is based on the LED in energy meter. The value of opto coupler will pass to next stage only if it is 1. These two outputs are compared and procedure the error value. If the value is positive means it will calculate the unit consumption and convert into amount to be payed by consumer. The negative value will help to send the alert message to substation. The below formulae is used to determine the power P1, P2 and E-bill:

$$P1 = VI\cos\varnothing \qquad \cdots\cdots\cdots\blacktriangleright \qquad 1$$

$$P2 = Q \qquad \cdots\cdots\cdots\blacktriangleright \qquad 2$$

$$U = (P1\%1000) \qquad \cdots\cdots\cdots\blacktriangleright \qquad 3$$

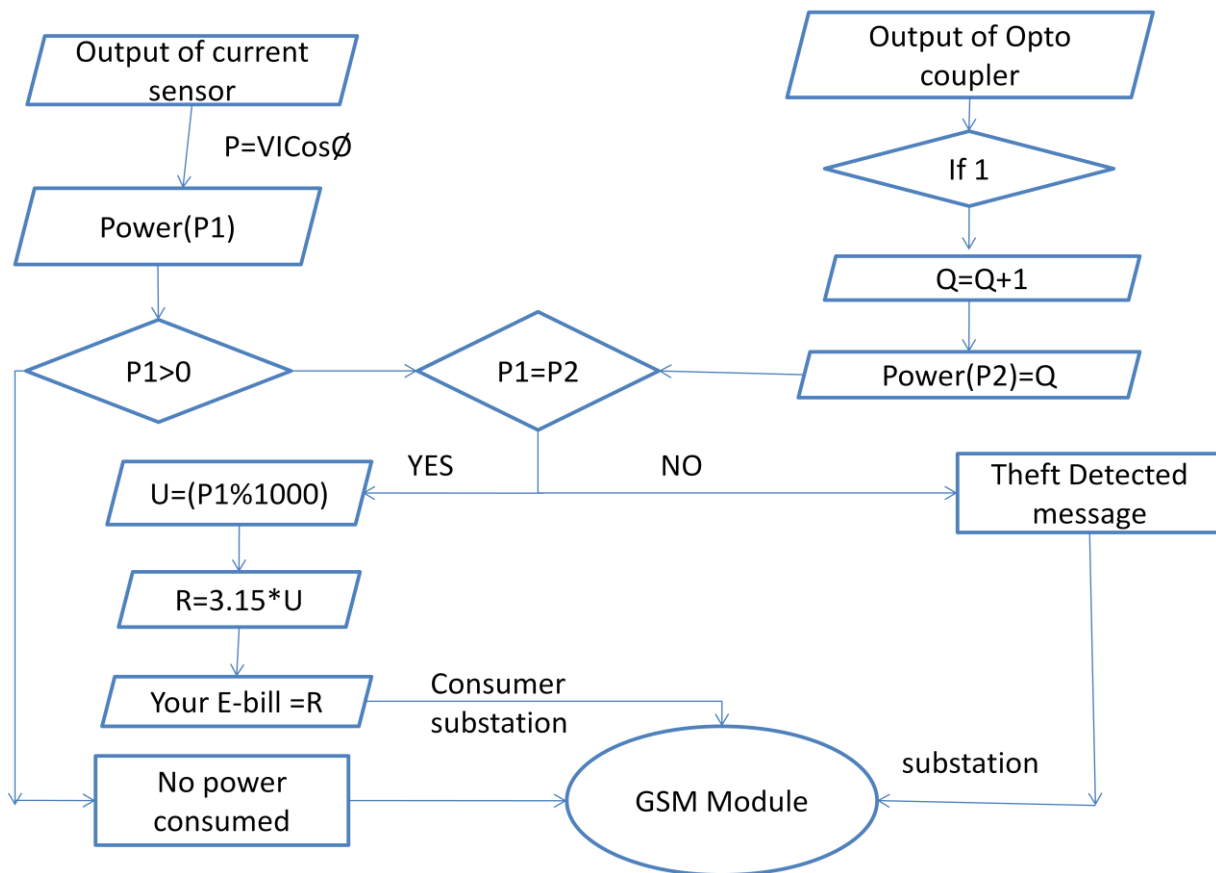$$R = 3.15 * U \qquad \cdots\cdots\cdots\blacktriangleright \qquad 4$$

Fig.3.Flow Chart for Process of MCU

VII. CONCLUSION

The proposed system provides the solution for some of the main problems faced by the existing distribution system. The design provides that power theft can be effectively curbed by detecting where the power theft occurs and informing the authorities. It saves time as well as reduces human error while taking readings in the energy meter. It also sends the information of unit consumption to nearer substation and to the consumer.

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