



Mobile Communication Based Electricity Power Anti-Theft System Using V-I Measurement Implementation at Consumer Entry Point

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ABSTRACT: -The proposed system is to notify a message to the nearby EB Station if any power theft happens. According to this project, when a power theft happens at any distribution transformer, immediately the location and Transformer number, will be transferred to the EB Station. The EB Station will immediately send the person to that location and find the people who indulged in this particular activity. The transmission of the information is achieved through the popular GSM Communication. The GSM Modem which is interfaced with the MCU sends an SMS to the EB Station. The content about the theft and the number to which the theft needs to be sent is decided by the Microcontroller. This venture exhibits another procedure to recognize vitality robbery and altered meters and also meters that are not working legitimately. It depends on a focal eyewitness meter that is in charge of metering the general vitality of a gathering of shoppers under scrutiny. Deterministic and measurement approaches are utilized to figure out which buyers have issues in their premises. Likewise, design acknowledgment is utilized to find vitality robbery utilizing sidestep.

Keywords: PIC16F877A, Microcontroller, GSM Modem, Tempered Meter SMS to EB Station,

I. INTRODUCTION

Power/vitality robbery, otherwise called non-specialized misfortunes (NTLs), is an enormous issue in circulation frameworks everywhere throughout the world. The world loses US\$89.3 billion yearly to power burglary and particularly in India, NTL can be of the request of 20– 30%. India loses around US\$16.2 billion yearly to NTL. Distinguishing proof of energy burglary and thusly their restriction are pivotal to ceasing this danger. Presently, numerous nations have begun setting up, cutting edge metering framework (AMI) to quantify, gather, store, examine and utilize control utilization data. AMI basically includes having shrewd meters and their related correspondence frameworks in huge numbers in the dissemination framework. In developing economies like India, the greater part of the metering is through inheritance meters and establishment of AMI framework may take some time. While computerized meters have been introduced in conveyance feeder hubs, they do not

have the capacity to impart information to a dispersion substation. Several papers and reports on utilizing savvy meter or AMI information to identify NTL can be found in people in general area. In 3 methods utilizing AMI information to identify control burglary is talked about. It rattles off a few AMI vitality robbery recognition plans, depending on grouping based, state estimation-based, and diversion hypothesis based calculations lastly analyzes every one of these strategies. Erol-Kantarci and Mouftah examine how information extricated from brilliant meters and information gatherers can give confirmation to lawful procedures in power burglary matters. the creators talk about existing savvy metering hones and the overarching circumstance in the Netherlands. They likewise exhibit a novel robotized technique to identify altering and robbery. The creators propose a strategy to find illicit tapping by utilizing brilliant meter information. In this technique, the system demonstrate/parameters of the dispersion framework and principally the voltage estimation information from the shrewd meters are utilized to find robbery focuses. The voltage estimations from savvy meters are contrasted and the evaluated voltages of the system, and a plausible burglary current is figured. This was one paper where voltage estimations were made utilization of to identify burglary. Be that as it may, this strategy requires learning of the system parameters (which may have a considerable measure of mistakes) and furthermore requires estimation of an impedance network of illicit (robbery) loads. In this Project, the transmission of the data is accomplished through the well known GSM Communication. The GSM Modem which is interfaced with the MCU sends a SMS to the EB Station. GSM (Global System for Mobile correspondence) is a

computerized versatile communication framework that is generally utilized as a part of Europe and different parts of the world. GSM utilizes a variety of time division numerous entrance (TDMA) and is the most generally utilized of the three computerized remote communication advances (TDMA, GSM, and CDMA). GSM digitizes and packs information, at that point sends it down a channel with two different floods of client information, each voluntarily opening. It works at either the 900 MHz or 1800 MHz recurrence band. One of the key highlights of GSM is the Subscriber Identity Module, ordinarily known as a SIM card. The SIM is a separable keen card containing the client's membership data and telephone directory. This enables the client to hold his or her data in the wake of exchanging handsets. Then again, the client can likewise change administrators while holding the handset just by changing the SIM.

II. SYSTEM CONFIGURATION

1. PIC MICROCONTROLLER

The 8051 is probably the most popular 8-bit microcontrollers ever. Many different I/O features are integrated around the 8051 core to create a microcontroller which needs only very little extra hardware to do most of the jobs. The main disadvantage of the standard 8051 core is that there's only one 16 bit pointer register available. Moving a block of data is a very tedious job which takes far too much data moving overhead. It also does not have an internal Analog to Digital Converter (ADC).

PIC16F877A is an 8-bit microcontroller which has 40 pin DIP and is based on Harvard Architecture. PIC stands for Peripheral Interface Controller and F for flash memory. Technology that is used in PIC16F877A is flash technology, so that

data is retained even when the power is switched off. Easy Programming and Erasing are other features of PIC 16F877A.

2. VOLTAGE SENSOR

A voltage sensor can in certainty decide, screen and can quantify the supply of voltage. It can gauge AC level or/and DC voltage level. The contribution to the voltage sensor is simply the voltage and the yield can be simple voltage signals, switches, capable of being heard signs, simple current level, recurrence or even recurrence adjusted yields. That is, some voltage sensors can give sine or heartbeat prepares as yield and others can deliver Amplitude Modulation, Pulse Width Modulation or Frequency Modulation yields. Usage of voltage sensor and current sensor systems has turned into a brilliant decision to the regular current and voltage estimation techniques.

3. CURRENT SENSOR

Current sensors measure AC and/or DC current levels. The sensors discussed here measure current and provide some sort of output that corresponds to the current being measured. The most important distinction to make when selecting a current sensor is whether AC and/or DC current needs to be measured. Another important specification to consider is if the sensor needs to be in-line with the circuit or if it works by being clamped around the wire to be measured.

4. GSM MODEM

GSM (Global System for Mobile)/GPRS (General Packet Radio Service) TTL-Modem is SIM900 Quad-band GSM/GPRS gadget, takes a shot at frequencies 850 MHZ, 900 MHZ, 1800 MHZ and 1900 MHZ. It is extremely minimal in size and simple to use as module GSM Modem.

The Modem is composed with 3V3 and 5VDC TTL interfacing hardware, which enables User to specifically interface with 5V Microcontrollers (PIC, AVR, Arduino, 8051, and so on.) and in addition 3V3 Microcontrollers (ARM, ARM Cortex XX, and so forth.). The baud rate can be configurable from 9600-115200 bps through AT(Attention) summons. This GSM/GPRS TTL Modem has interior TCP/IP stack to empower User to interface with web through GPRS highlight. It is appropriate for SMS and also DATA move application in cell phone to cell phone interface

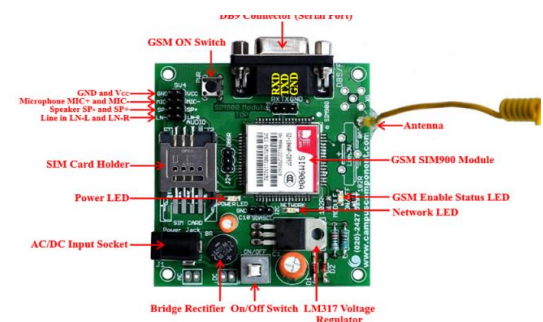


Fig1.1 GSM Hardware

4. HARDWARE BLOCK

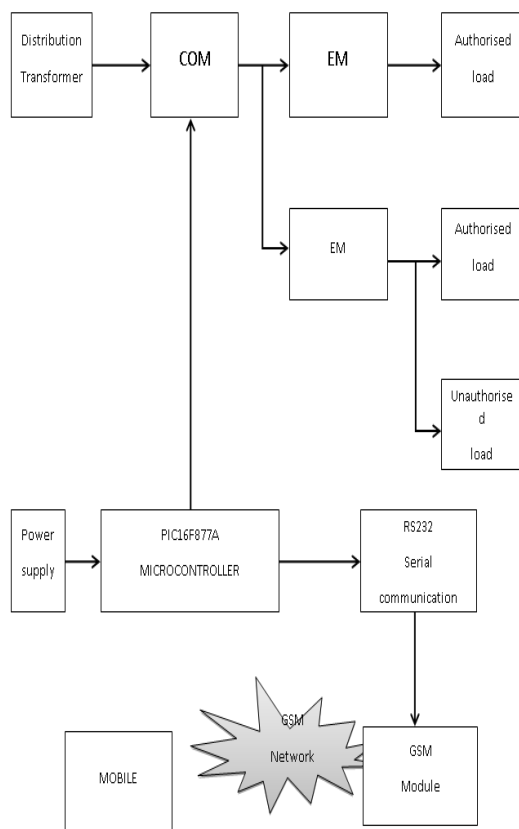


Fig 1.2 Block Diagram of System

HARDWARE DESIGN

The above piece chart comprise of the a transmission line from transformer, Central Observability Meter(COM), Energy Meter (EM), with two approved burdens and then again COM is associated with the PIC16F877A Microcontroller in the RS232 Serial correspondence with the GSM module through the versatile correspondence which is the last yield of our Proposed framework. The

Microcontroller is Driven by the +12v control supply

The power appropriated through the framework is estimated and the power got at the buyer level is observed by the computerized EM the estimations are ceaselessly checked by the voltage and the present sensors. The RS232 correspondence is set in the PIC controller area then the both the sensors are likewise associated with the PIC controller segment and the GSM module comprise of the SIM900 GPRS gadget with the SIM Slot into Which the SIM from which the SMS yield is to be sent to the Receiver or EB Board.

The Power supply given to the Microcontroller is given with the Step Down Transformer to and the Bridge Circuit to diminish the 230v to the 6v through which just the Micro controller can be driven yet then the when the variety is higher than the resilience level promotion fixed to Microcontroller an info is given to the controller then the controller gets the data From the sensors then it switches on the GSM module and after that when the Module is initiated the SMS information put away in the Microcontroller is passed to the GSM transmitter receiving wire to the recipient that is the EB board or the shopper level.

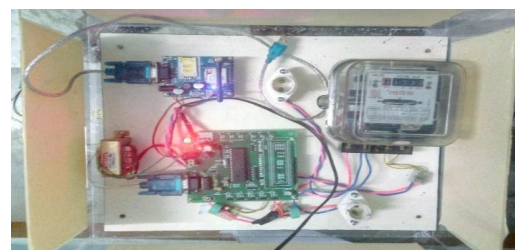


Fig. 1.3 When no load is Connected

The content about the theft and the number to which the theft needs to be sent is decided by the Microcontroller. The Programming of the microcontroller is done through the Win PIC programmer also with the MPLAB IDE along with the High level C Compiler. The output the Proposed

System is in the Content of the SMS received from the SIM which is placed in the GSM Module



Fig 1.4 When Authorised Load is Connected



Fig. 1.5 When Unauthorisedload is Connected

OUTPUT OF THE SYSTEM

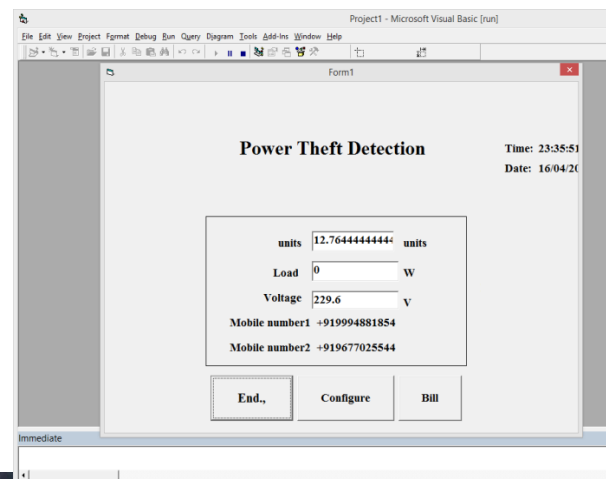


Fig. 1.6 When No load is Connected

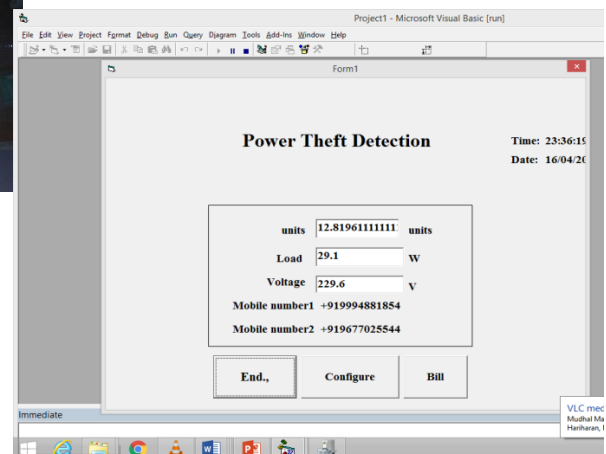


Fig. 1.7 When Authorized Load is connected

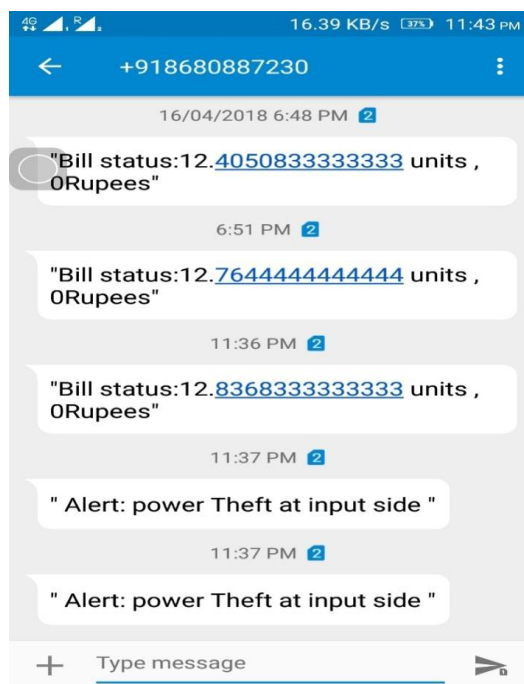


Fig 1.8 Screenshot of the SMS Received

HARDWARE IMPLEMENTATION

MAX232

The Max 232 is a dual RS-232 receiver / transmitter that meets all EIA RS232C specifications while using only a +5V power supply. It has 2 onboard charge pump voltage converters which generate +10V and -10V power supplies from a single 5V power supply. It has four level translators, two of which are RS232 transmitters that convert TTL\ CMOS input levels into + 9V RS232 outputs. The other two level translators are RS232 receivers that convert RS232 inputs to 5V

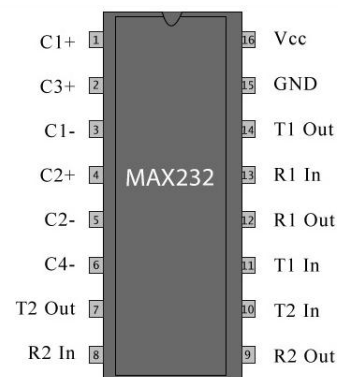


Fig 1.9 Pin Diagram of MAX232

RESULT

In our system we have used the Energy meter as the Central Observability Meter and then the visual basic is used for the display of the two energy meter output. The output is taken only when the Normal Authorised load is provided and the mobile number in the output shows the Receiver mobile no. to which the detected message is to be sent. The power theft detected and then it sends the message details about the theft load and then after the detection how much of the volts have been detected can also be sent through the SMS to the no. which has been provided. In case if any mobile no. has to be change can also be done in the system itself manually.

CONCLUSION:

Thus the proposed system provides the clear details about the power theft and detected by using the V-I measurement. This can be used at the consumer point and this is the most effective need in countries like where the transmission is done through the open wire transmission. Also in the proposed system the accuracy is little bit lower than

can be developed on the future work. In the Proposed System the Billing has been calculated based on the current tariff plan of the TNEB. In the Proposed System Visual Basic is used to Measure the EM outputs.

FUTURE SCOPE:

With our Proposed system the Accuracy of the Power monitoring can be increased. By using the NANO technology the system can be reduced and also it has some manual works the manual works can be converted to the automatic systems. In the Future they can be developed with the Android updating of the monitoring by the mobile application Automatic EB Billing system can be Implemented By the regular UPI Transaction or any other method of online transaction

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