

Detection of Illegal Use Electricity By Using GSM

Mr.Bhoj Pradip S.¹, Mr.Bute Dhaneshwar R²., Ms. Derle Komal B³, Ms. Baviskar Kanchan S.⁴,
Prof.Ms.Gawande Mayuri B⁵

Dept of Electrical Engineering,
Matoshree College of Engineering & Research Center, Nashik

Abstract- This paper deals with Illegal use of detection of power in every houses and in industry. Electricity is very important for day to day life and spine for the industry. Illegal use of power is increased that's why so many electrical and economical problems are occurs. So we minimize the use of illegal electricity by using GSM Based technology. we are used , here three current transformers are placed in each phase of secondary side of the post line. The output of CT values is given as input to PIC microcontroller convert analog inputs to digital. Then PIC compares the input current and the set tolerable current. If compared result has any negative values then this particular post is detected as overload point out . The information will then be quickly processed by the microcontroller and a SMS will be send through the GSM technology.

Keywords- GSM, Current Transformer, Microcontroller.

I. INTRODUCTION

Electric utilities lose large amounts of money each year due to overloading by some consumers. Most of the consumer operate there appliances above sanction demand or illegal . Agriculture consumers mostly operate there pumps above sanction value, due to this distribution transformer get overloaded and causes damage and winding burns occurs. Electricity fraud can be defined as a dishonest or illegal use of electrical equipment without permission of the supplier intentionally to avoid billing charge. It is difficult to distinguish between honest and fraudulent customers. Realistically, electric utilities will never be able to eliminate fraud. Investigations are undertaken by electric utilities to assess the impact of technical losses in generation, transmission and distribution networks. Distribution Power Loss comprises one of the most important concerns for electricity Utilities worldwide.

It is economically loss and also reliability and efficiency of power system get reduces. The considerable voltage drop, power factor reduction are the technical losses occurs due to this. In order to minimize that we will measure the parameters like voltage, current for consumer and detect the rating of pumps. If there is found of excess of load above sanction the distribution engineer get massage about this and

he call that consumer to give proper sanction or "to increase in sanction", unless he disconnect that consumer electricity supply. Hence from this perfect load analysis and illegal use of electricity is reduced up to same amount and according to that distribution company provides suitable transformer, feeders for particular load capacity.

In this proposed GSM technology used to transmit the meter reading to the customer and government with the required cost. This process will be happen when needed that means if SMS is received from authorized server mobile transmission between customer and government . Then the electricity theft controlled by GSM module. In this system current transformer are used, here three current transformer is placed in series with each phase of the line. The output of values of current transformer and potential transformer are given to microcontroller. In microcontroller the program is stored for comparing values of output from current transformer and potential transformer and reference value stored in program. The output of CT and PT are connected to microcontroller. By using GSM module the project at designing such a system which will automatically collect the reading and also detect the theft and feedback from actual field is achieved. In this system simple and minimum components are used and hence less costly.

II. EXISTING SYSTEM

In existing system wireless communication system of energy meter used with Zigbee, relay control and GPRS. The cryptographic method are used to secure the communication channel and zigbee for the transmission of data in a serial process. Drawback of this process is to collect the readings, going in the particular range of area and manually cut power supply if needed, so the chance to increase of manipulation .

III. GSM TECHNIQUE

In proposed system GSM(Global System for Model) technology used for detection of current whose starting value is 10 to 15% more than the rated current.In proposed model the current transformer connected in series with each phase measure the total current and potential transformer measures

the voltage. The program stored in microcontroller compares the measured value and reference values. If there is difference between those values the microcontroller gives command to GSM module and GSM module sends the message to utility person. The utility person requested to customer to use motor or other equipment with in capacity or to increases the sanction rating.

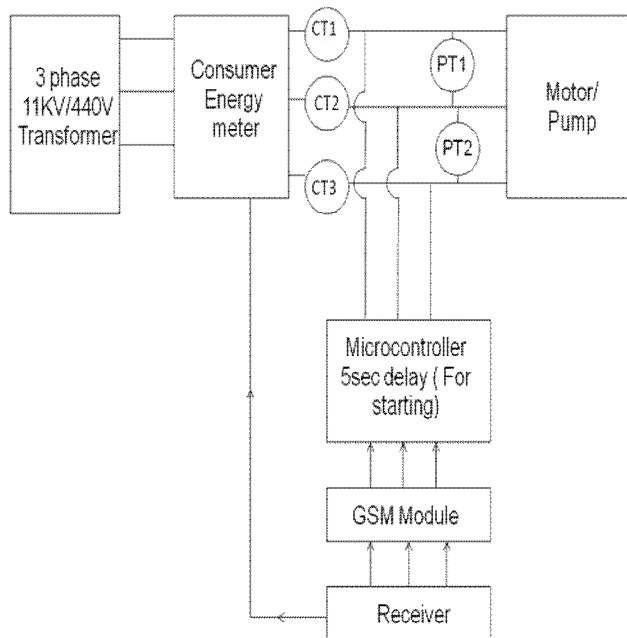


Figure 1. Block Diagram

If the customer connect motor load as per sanction load from MSEDCL. When motor start by starter used then the motor reached the 10 to 15% more current at starting themotor and 4 to 5 sec later motor takes rated current from the system . This current is sense by the current transformer and the voltage supplied is sense by the potential transformer. This sensed current and voltage is measured by the current and voltage measurement circuit used in model. The measured voltage and current is send to the microcontroller. In microcontroller the already program is stored . There as per the sanctioned load connection the conditions about rated current and voltage are satisfy and normal working is done.

Where the 5 second delay is given to model at starting time of motor due to 10 to 15 % more power absorption by load. If the customer used excessive load then by the delay timer the microcontroller is not execute the program up to 5second. Then the motor takes its rated current which value is greater than value of stored program with tolerance for variations and sense by the current transformer and sends to the measurement circuit. The measured value of current is send to microcontroller which is greater than the program stored value and microcontroller executed the program and send the signal to next connected GSM module.

The GSM module is get active and send the message to the MSEDCL person or to engineer. Then the engineer got the information about the illegal use or thefting and they takes the corrective action on this. Where the Detection of Excessive Overload Above Sanction Capacity is done.

IV. BASIC BLOCK DIAGRAM COMPONENTS

Energy Meter

Energy Meter is a device that measures the amount of electric energy consumed by anelectrically powered device. Electrical utilities use energy meters installed at customers' premises to measure electric energy delivered to their customers for billing purpose. They are typically calibrated in billing units.

Microcontroller

PIC 18F4520Microcontroller is the main part of automatic reading and theft control. It is 16 bit microcontroller, PIC 18F4520 consist of high performance and low cost of network technology. PIC 18f4520 belongs to a class of microcontroller of RISC architecture. It has internal 10 bit analog to digital converter.

Current transformer

A current transformer is a device are used to convert high magnitude of current to low magnitude of current for metering and protective device. current transformer are also used where high voltage current is to be metered because of the difficulty of providing adequate insulation in meter itself. CTs are a series connected type of instrument transformer. They are designed to prevent negligible load to the supply being measured and have an accurate current ratio and phase relationship to enable accurate secondary connected metering. The CT is typically described by its current ratio from primary to secondary e.g. 1000:5 CT .

GSM Module

Global system for mobile communication(GSM) is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHzand 1900MHz frequency band. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams on client data, each in its own particular time slots. The digital system has an ability to carry 64kbps to 120mbps on data rates. The coverage over on each cell varies according to the implementation environment.

There are 5 different cell sizes in a GSM network micro, pico and umbrella cells.

Main components of GSM:

Mobile station: It is the mobile phone which consist of transceiver, the display and the processor and is controlled by a SIM card operating over the network.

Base station subsystem: It act as an interface between the mobile station and the network subsystem.

Network system: It provides the basic network connection to the mobile station. The basic part of the network subsystem is the mobile services swing center which provides access to different network like ISDN, PSDN.

Flow Chart

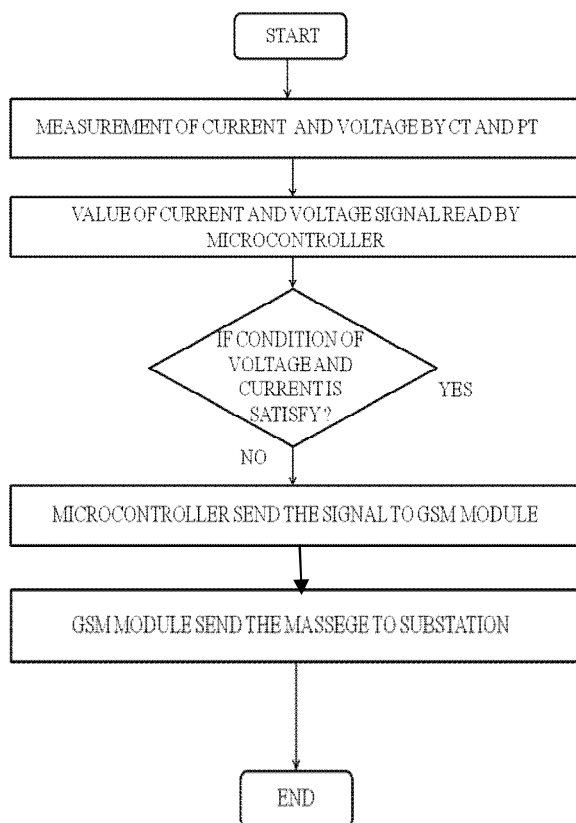


Figure 2. Flow Chart

To program a PIC controller to detect a power theft on above flow chart as shown in figure 2.

V. CONCLUSION

The proposed module reduces manipulation work and illegal use of electricity using GSM. In the system provides numerous advantages of wireless network system With the

help of this GSM model the actual monitoring and detection of customer electricity uses are achieved. From that the utility takes the necessary action to reduce losses in transformer and whole power system network hence it reduces economical losses. Detection of electricity theft in agricultural sector as well as residence, and industrial analyze and correctly identified.

REFERENCES

- [1] MSEDCL training centre Eklahare, Nashik (M.O.U. between MCOERC and MSEDCL Nashik)
- [2] ChandoriSubstation(Tal-Niphad)-data measurement.
- [3] International General March 2015 Named As Distribution Transformer Overload Protect Tripping Circuit.
- [4] Nilesh Mohite¹, Rinkuraj Ranaware², Prakash Kakade On the topic on "GSM Based Electricity Theft Detection."(IJSEAS) – Volume-2, Issue-2, February 2016 ISSN: 2395-3470 On Feb 2016.
- [5] International General March 2016 Named as A Design Method For Enhancing Distribution Transformer Overload Capacity.