GSM BASED EXCESS LOAD USAGE IDENTIFICATION

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Abstract—The purpose of this method is to find the excess load usage of an industry and to control that by terminating the power for that particular industry. This is done with the help of GSM technology. This system is designed to send SMS alerts whenever the voltage/current exceeds the predefined limits using GSM. If there is no response from the Industrialist then the whole supply will be permanently turned off. By this way, we can save the power consumed in Industries and theft can be controlled.

Keywords—GSM; Theft Control; Power Consumption; SMS Alerts

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1. INTRODUCTION

Industry is the production of goods or related services within an economy. The major source of revenue of a group or company is the indicator of its relevant industry. When a large group has multiple sources of revenue generation, it is considered to be working in different industries. There is a major problem for EB department to monitor excess usage of power by an Industry. EB control section in the embedded control unit helps to identify and control it. This section continuously monitors an Industry's power usage and calculates the power utilization. If power usage exceeds the limit, this unit immediately cuts off Industry section's power supply and switch off the loads. Industrial section's power supply will resume once the EB station sends a code after the payment of penalty for excess load usage. At the same time warning message will be sent to the industrialist's mobile regarding excess power usage. If a particular industrialist repeatedly exceeds the power usage, his information will be sent to EB department and consumer section's power supply will be terminated permanently. A message will be sent to EB department about the power utilization at the transformer end. In this system GSM is used to send the information about the load at every time of on off motors to EB station. When the excess load usage is occurred the EB station member access and switch off the total power of that particular section. This information sends through GSM communication.

2. EXISTING SYSTEM

2.1 Overall view:

In existing system, they proposed a method which measures only the current consumption and display at LCD. If the limit of the power exceeds there is no system to control the load. Efficiency in controlling the power utilization is less.

2.2 Disadvantage:

- Couldn't able to identify the overload power consumption.
- We can only able to monitor the electrical parameters manually.
- Time consuming.
- Power theft occurs.

3. PROPOSED SYSTEM

3.1 Solution

In this system, when the power exceeds the limit then a message will be send to the consumer. If they doesn't care about the limit that has been exceeded, then the person in the EB station will cut-off the power that had been given to the user. Therefore the power utilisation of each and every user will not exceed their limit. Hence the power could be saved for purpose.

3.2 Advantages

- Focussed on electricity utilization and load management.
- Determination of power theft.

4. HARDWARE REQUIREMENTS

- PIC16F877A
- GSM
- Power supply
- Max232
- DC Motor
- Driver circuit
- LCD
- Android Mobile
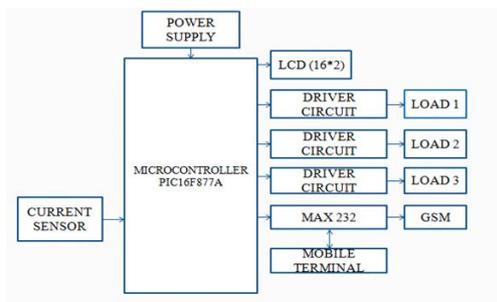
5. SOFTWARE REQUIREMENTS

- Embedded c
- MPLAB ide
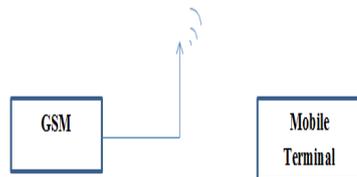- Hi tech C-compiler
- Proteus

6. ARCHITECTURE

The architecture of the proposed method has two sections

- Industry section
- EB section

6.1 Industry section

6.2 EB Section

7. WORKING

The system determines the excess load usage and controls it by sending message to the authorities over GSM network using GSM Modem/phone along with user ID at transmission lines. It has two parts EB control section and Industry control section. Whenever the electrical parameters exceed the predefined values, the Relay can be used to operate a Circuit Breaker to switch off the main electrical supply. Once the run time is set machine's motors will be running sequentially which will results in maximum utilisation of power. There is also a major problem for EB department to monitor excess usage of power by the Industrialist. EB control section in the embedded control unit helps to identify and control it. This section continuously monitors machine's power usage and calculates the power utilization. If power usage exceeds the limit, this unit immediately cuts off industry section's power supply and switch of the motors. At that time warning message will be sent to industrialist mobile regarding excess power usage. If a particular industrialist repeatedly exceeds power usage for many times, that information will be sent to EB department and industry section's power supply will be terminated permanently. In this system GSM is used to send the information about the load at every time of ON/OFF motors to EB station.

8. CONCLUSION

This system described a simple method to implement a wireless embedded system to monitor the excess load usage identification and to control it. The description includes functions like current sensing, signal conditioning, analog to digital conversion, serial data framing, wireless communication and monitoring. GSM wireless excess load usage monitoring system can use long-range wireless communication and computer network technologies to send SMS.

This system is aimed at reducing the heavy power and revenue losses that occur due to excess power usage and theft by the customers. By this design it can be concluded that excess power usage can be effectively curbed by detecting it and controlling it by informing the authorities. Also an automatic circuit breaker may be integrated to the unit so as to remotely cut off the power supply of the consumer.

9. FUTURE SCOPE

In future, this project can be implemented and validated all over the country. Along with this, new architectural components can be incorporated so that the system can be completely used for optimizing the energy consumption.

Instead of using wireless data transmission technique, one can use power line communication. In power line communication data signal is modulated on power signal and sent it through the same electrical distribution network. This will reduce the cost for separate communication line.

REFERENCES

[1] Alessandro Ferrero, "Meter voltage measurement" , in John G. Webster(ed.),Electrical Measurement, Signal processing and displays, pp. 1.20-1.21,CRC Press,2004.

[2] Donald G. Wayne H.Beaty, "Standard Handbook for electrical engineers" 11th edition , McGraw Hill,2003 , New York.

[3] Sagar Patil, Gopal Pawaskar ,Kirtikumar Patil "Electrical power theft detection and wireless meter reading"

[4] Sid Katzen, "The Quintessential PIC Microcontroller",Springer-Verlag,2000.

[5] Soham Gosh JRF, Department of Energy Science & Engineering , IIT Bombay, India.

[6] P.Kadurek,Student member, IEEE, J.Blom, J.F.G.Cobben, W.L.Kling, MemberIEEE1, "Theft detection and smart metering practices and expectations in the netherlands".

[7] Virendra Pandey, Simrat Singh Gill,Amit Sharma "Wireless Electricity theft detection system using Zigbee" MIT,Moradabad.

[8] Xbee Pro OEM RF Module reference manual, Digi International Inc.,2008. [9] Yi Yang, Deepak Divan, Ronald G.Harley and Thomas G.Habetler , "Power line sensor net -A new concept for power grid monitoring", IEEE power engineering society general meeting, 2006.

[9] Zhou Yao, Wang Wei, Xu Lijie , Ni Pinghao , Wang Lin , "Transmission line temperature on-line monitoring system based in Zigbee" International conference on sustainable power generation and supply,2009.