PROTECTION,MONITORING AND CONTROLLING FOR DISTRIBUTION LINE AND HOUSE LOAD

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*Abstract-*The proposed project is used to monitor the distribution line and the consumer end power side .The line current and voltage from the distribution line is monitored continuously and sends to board side in SMS format periodically for recording and monitoring purpose. This enables the board side to improve power quality of the distribution side. The line fault current sensed by the circuit and the line is isolated completely automatically. Auto restore function is provided to restore the line but even if the fault persists the line is disconnected permanently and board side is informed via SMS. The line can also be disconnected/connected from authorized mobile no without going to transformer side which is a great boon for line man while undergoing line repair works.

The house side line is also monitored by the system . Each house side is allotted a fixed load and if house owner increases the load knowingly or unknowingly the system alerts the user by means of alarm and display .If the user disconnects the excess load then system reconnects the load otherwise the house is disconnected from the line permanently and informed to board via SMS . The load can be only connected from board side via SMS or manually . This feature ensures board side to tap more revenue and maintain power quality . If there is need to disconnect load due to overdue the line can be disconnected by SMS and reconnected back via SMS on payment . Also optional and theft features can be provided that enables board to detect electrical theft .Also connectors are provided to connect security sensors , gas leak sensors etc and this feature enable user to increase the security of his house and premise .Optional backup power supply feature is provided to ensure power to local houses in case of localized fault isolation.

I. INTRODUCTION

In this paper we discuss about the protection, monitoring and controlling of both distribution line and house load . Proposed system is used to connect and disconnect the consumer end side and distribution side on several faulty conditions.

The distribution side voltage and current is recorded and monitored periodically with in the substation . If any fault occurs on the distribution section the faulty section will isolate automatically and the substation will receive SMS . The substation will proceed two or three times of attempts to clear the fault , if the fault persist on the line the line will isolate completely .

On the house load side the voltage and current is also sensed and whenever the allotted load exceeds by the consumer knowingly or unknowingly the system will alert the user by means of SMS by a GSM 800 placed on the house load side . This process also

provide additional features like disconnection of consumer end supply due to payment , electric theft etc .

II.   IN THE DISTRIBUTION SECTION

The line supply is passed through the current transformer and stepdown transformer . The current transformer will step up the voltage and measures the current . While the step down transformer measures the voltage . The measured voltage is passed to the rectifier it will convert AC to DC . Then passed to the scaling network where it is essential for the efficient operation of ADC because here we used ADC will operate normally in a range of 5V. So scaling network will convert the voltage to a lower value before it is fed to the ADC. Here we use ADC 0808 for the conversion of analogue signals to digital and is fed to the micro controller . The micro controller used is AT- 89S52 which should be low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM) . The AT-89S52 could more probably comfort to interface with GSM modem SIM 800 and ADC 0808 . The switching section will provide the relay operations on the faulty conditions . When ever the faulty section is isolated the microprocessor needs to work for check the fault is cleared for that purpose a back up supply is provided, the back up supply may be an inverter or battery . This back up supply is also fed to switching section too for the relay operation .GSM Modem SIM 800 is a quad band GSM/GPRS module ,that work on the frequencies of GSM 850MHz , EGSM900MHz   ,   DCS1800MHz   and PCS1900MHz . SIM 800 features GPRS multi slot class 12/class 10 and support GPRS coding schemes CS-1 , CS-2 , CS-3 and CS-4. SIM800 is a tiny configured on having dimension of

15.8*17.8*2.4mm so it can be used in smart phones, PDA etc . Here the GSM modem will used to send SMS based on faulty condition to the substation side over which will cause damage to the ADC**.** So scaling network will convert the voltage to a lower value before it is fed to the ADC. Here we use ADC 0808 for the conversion of analogue signals to digital and is fed to the micro controller . The micro controller used is AT- 89S52 which should be low-power, high-performance CMOS 8-bit microcomputer with 8K   bytes of Flash programmable and erasable read only memory (PEROM) . The AT-89S52 could more probably comfort to interface with GSM modem SIM 800 and ADC 0808 . The switching section will provide the relay operations on the faulty conditions . When ever the faulty section is isolated the microprocessor needs to work for check the fault is cleared for that purpose a back up supply is provided, the back up supply may be an inverter or battery . This back up supply is also fed to switching section too for the relay operation .GSM Modem SIM 800 is a quad band GSM/GPRS module , that work on the frequencies of GSM 850MHz , EGSM900MHz   ,   DCS1800MHz   and PCS1900MHz . SIM 800 features GPRS multi slot class 12/class 10 and support GPRS coding schemes CS-1 , CS-2 , CS-3 and CS-4. SIM800 is a tiny configured on having dimension of 15.8*17.8*2.4mm so it can be used in smart phones, PDA etc . Here the GSM modem will used to send SMS based on faulty

III.   IN THE HOUSE LOADS

In the house load side the over voltage and over current is sensed and send to the ADC 0808 . ADC 0808 is also connected to the micro controller AT-89S52.The theft sensor and gas leak sensor is also connected to the   micro controller . Both of sensors will detect the changes and send SMS to the consumer via GSM modem. Here also we use GSM SIM 800

type modem . The micro controller will examine the over voltage and over current flowing towards the house loads. It also implement protection towards the over use of power knowingly or unknowingly by the consumers. This over use will detect, send a SMS to the consumer and disconnect automatically .This method will help to maintain power quality and provides additional features like if non payment of power consumption will lead to the disconnection via SMS and connect automatically on payment via SMS or manually . Also optional and theft features can be provided that enables board to detect electrical theft. Also connectors are provided to connect security sensors, gas leak sensors etc and this feature enable user to increase the security of his house and premises . This method enables more safety and efficient transferring of power towards the consumer section condition to the substation side.

IV.   ADVANTAGES AND APPLICATIONS

By implementation of this system will provide several benefits including efficient power consumption , isolation of a faulty section for maintenance ,disconnection and reconnection due to payment ,electric theft , gas leak etc can be implement using this project . Its advantages should be a cost efficient one based on other types of distribution line protection it should need micro grid, super capacitor etc all of this makes the line protection costly .This type of distribution line and house load protection provide additional features with in a limit of cost.
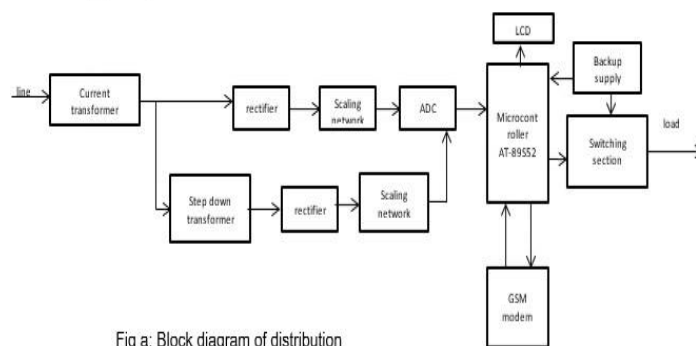
A. Bock diagram
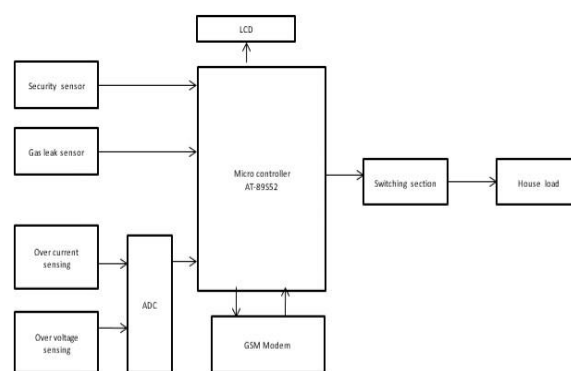

Fig a: Block diagram of distribution line

Fig b: Block diagram of house load

V.   CONCLUSION

This project aims for implementation of low cost , high efficient protection , monitoring and controlling of distribution line and house loads . This system will implement protection against faults, electric theft and a back up supply for a particular area where supply is necessary in the distribution section. In the house load side it will provide security sensors,automatic connection and disconnection, gas leak sensors etc .

VI.   REFERENCE

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