

Self Monitoring Automatic Routine Technique

Selvamani^[1], Sathish^[2], Vignesh^[3], M. Vijayaragavan^[4],
^{[1][2][3]}-(Student),^[4]-(Asst. Professor)
Mailam Engineering College,
Mailam, Villupuram District-604304

Abstract— Self-monitoring Automatic Routine Technique (SMART): In today'S world, power saving is very important and difficult. There are many power generation methods, it has become very difficult due to insufficient resource. So, saving of power is need for our society. This paper present a street light, home appliance are controlling and monitoring system based on microcontroller and Global System Mobile communication (GSM). The system may consists in run it automatic mode, which control street light. The engineer at electricity board can control the street light of various areas. If any fault on the street light the information will transferred through GSM to EB. The key objective is to design an intelligent system as takes for controls the loads on anywhere and any place and detect the fault easily and also consume low power.

Keywords: PIC microcontroller, GSM module, Current Transformer, Relay, Mobile, PIR sensor.

I. INTRODUCTION:

In these world, to few type of source to generate on the electricity. But we can waste for electricity on many places. For example street lights, houses, trains etc. When the today's world saving for electricity in very important one. First to target for street lights.

In this concept (or) project is used to control street light automatically. Explanation given by, when consist one area run many number of loads (street lights) are blowing waste on 24 hours in many places, so then it's consume more power, this problem rectified on project by automatic time setting process. The main objectives and process of this project like as Fault identification, time setting and power saving. Load are normally run when sudden fault is occur the fault information is send through mobile phone using GSM (Global System Mobile Communication) module. Project will fully a wireless communication (or) through the SMS. GSM communication used AT command. We have also include sensor method by means of the loads run in midnight sensor will placed lamb post, the sensor will activated from the movement of object to run lamb (load) ON and OFF automatically and consume sum power. The sensor will become use PIR sensor.

The command on send through the 0's and 1's format. The 0's means light is off and 1's means the light is on. The control operation need through two persons are MASTER and USER. When MASTER to control the time changing, lights ON and OFF. And also USER can control only to lights ON and OFF. Master like controller and user like operating person. Command of ON and OFF time send through user to

controller at any point, to give depending upon Time (command) Street light will glow at a time. During the operation Fault is occur in particular place to sense the fault immediately and send the information (SMS) to USER and MASTER mobile through GSM. The fault can sense by using current transformer and comparator. Comparator when compare actual value and predefine value, actual value gives from current transformer.

II. SYSTEM ARCHITECTURE

Energy conservation is very important and difficult. So, saving of power is need for our society. This paper present a street light, home appliance are controlling and monitoring system based on microcontroller and Global System Mobile communication (GSM). The system may consists in run it automatic mode, which control streetlight and domestics load. The system used to components are PIC 16F877A, GSM module, Current Transformer, LCD, PIR sensor, relay. Now the components are interfaced with the PIC controller. The PIC controller is 4 port and 40 pins on an IC. Each port on 8 pins are allocated. PIC means Peripheral Interface controller, it is consists three types memory ROM, RAM, EEPROM. Interface the GSM module to controller to connect the transmitter and receiver pin (RX and TX pin). Current Transformer is used to limit the flow of current and sense actual current value.

Current transformer connected to the series on the comparator circuit. Comparator is used to compare the values of actual and predefine currents. Comparator have two terminal one is fixed current and other is flow current or load current (actual). When the fixed current is higher than the load current or equal than the load current no problem for load. Then the fixed current is lower than the load current now problem on load when fault is occurred. Comparator value to read the controller and to send through the Message from MASTER and USER mobile using through GSM Technology.

III. SYSTEM BLOCK DIAGRAM

To use every components are connect the circuit block as shown in below. The almost every components are interface with the microcontroller. The 230v single phase AC supply is rectified with 12v DC supply to connect the microcontroller board. The Fig. 1 shows the block diagram of the automatic street lighting system

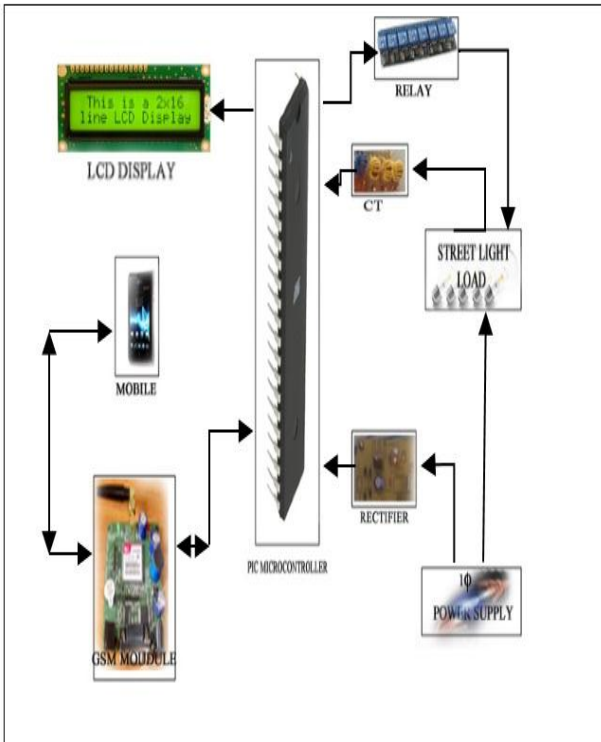


Fig. 1 Block diagram

IV. PIC MICROCONTROLLER:

PIC stands for Peripheral Interface Controller, Used by industrial developers due to availability space and serial programming for flash memory. PIC 16F877A is a 40-pin 8-Bit microcontroller, it is family of Harvard architecture and manufactured by Microchip technology.



Fig.2 pic microcontroller

V. GSM MODULE:

Global System for Mobile communication. It is based upon AT command digital mobile telephone. GSM uses a two person communicate in anywhere and any place torange in network. If variation of Time Division Multiple Access technique. Fig 3.shows GSM module



Fig.3 GSM module

VI. CURRENT TRANSFORMER

The current transformer is a type of “Instrument Transformer”. Shows in fig 4. Generally Transformer is used as only step-up or step-down of the current. When the current transformer is used limit the current of the transformer for this circuit. The primary winding connect with comparator through microcontroller. Secondary winding connected through line current of load. When it is used to sense the current through load.



Fig 4 current transformer

VII. COMPARATOR:

A Comparator is a device that is used to compare the two voltages or currents. Two input terminals, one terminal has a fixed current and another terminal has a load current. When its connected output to microcontroller and input is connect to current transformer.

VIII. RELAY

Relay is an electromechanical switch device. Which is perform ON and OFF operation without any human interaction. IN relay is connected to microcontroller, user gives the command. The depending upon user commend relay will operated. To interface relay into microcontroller using ULN2003 drive integrated circuit(IC).

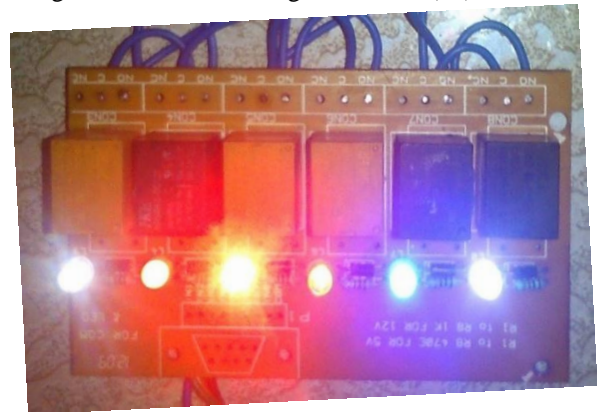


Fig.5 Relay

FLOW CHART:

Flow chart given below the Self-Monitoring Automatic Routine Technique, fig shows 6.

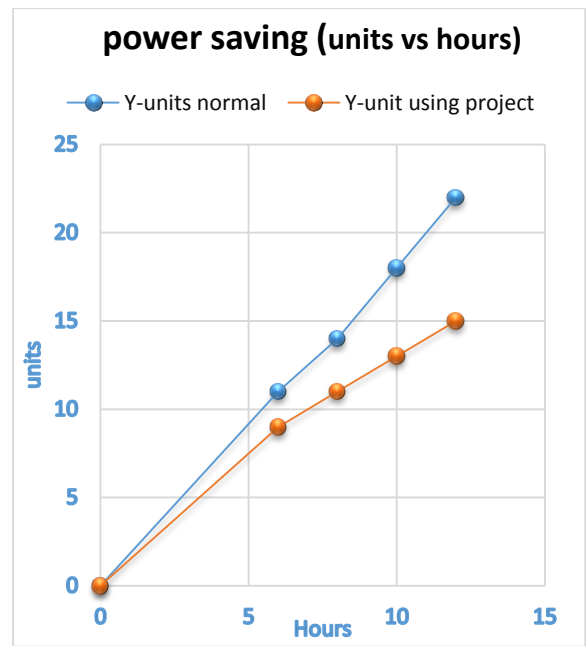
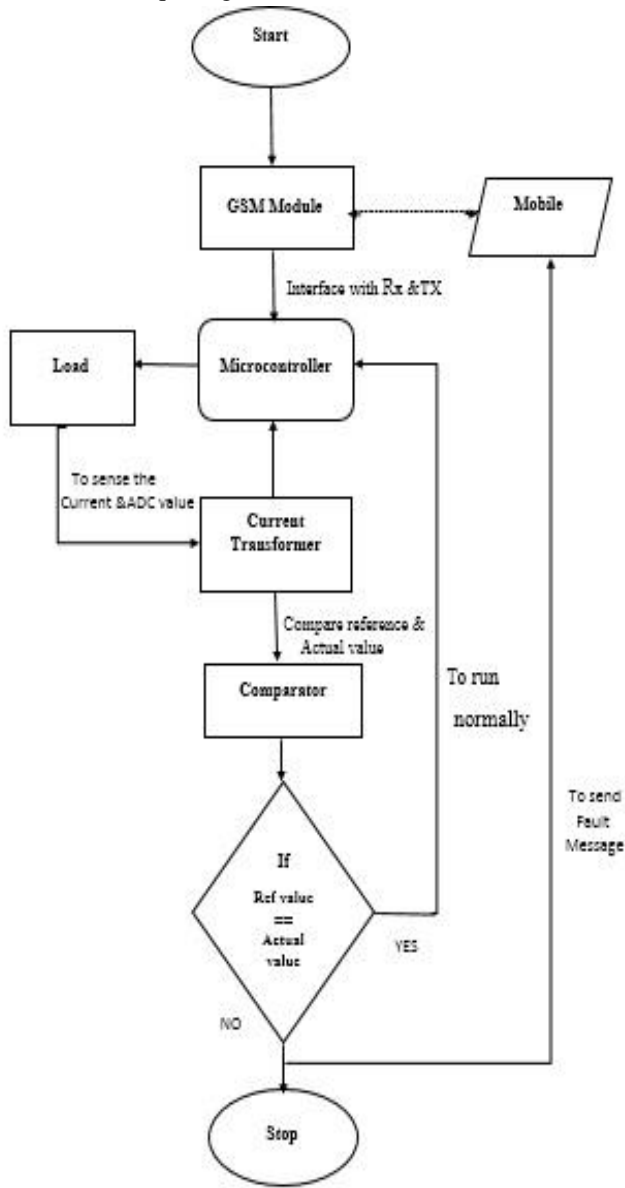


Fig 7 shows power saving graph

ADVANTAGE:

- Any authorized person can control whole city domestic light a through single point of control.
- As any domestic system can be switched ON\OFF according to the time automatically or manually at specific location.
- Fault identification.
- Power savings.
- Increase lamp life.
- High security and safety.
- Dimming of lights according to required intensity is possible and by movement of any living object.

APPLICATION:

- Street lights.
- Industrial purpose/Home appliance.
- Highways

POWER SAVING:

When it is used to control the lamp (street light) and to save the energy. let consists of area cover 30 street light, the light (60 watts) blown in 24 Hours Take 43.2 units, light blown 12 hours take 21.6 units. But using this project only take 15.3units.To save the power in this project 6.3 units.

CONCLUSION

In this project we have implemented the automatic ON and OFF of the street light .The fault in the any location that will be intimated to the respective officer and that fault will rectified in a short time. Where as in existing method, the ON and OFF of street light is done manually. If fault occur in any one of light no can identify it and we cannot replace it but now,We can replace it.

REFERENCE

- [1] R Shilpashree ,H Shruthi to design GSM BASED AUTOMATION OF STREE-T LIGHT-IJSET - International Journal of Innovative Science, Engineering & Technology, Vol. 1 Issue 3, May 2014
- [2] N. Nagaraju, M. S. Kiruthika to design FAULT SENSING IN A REMOTE TRANSFORMER USING GSM &AUTOMATIC ON/OFF OF STREET LAMPS-Vol. 2, Issue 10, October 2013
- [3] R. RUBANANTH, T.KAVITHA to design GSM BASED RFID APPROACH TO AUTOMATIC STREET LIGHTING SYSTEM- Journal of Theoretical and Applied Information Technology 30th April 2012. Vol. 38 No.
- [4] Richu Sam Alex, R Narcisse to design Energy Efficient Intelligent Street Lighting System Using ZIGBEE and Sensors-(IJEAT) ISSN: 2249 – 8958, Volume-3, Issue-4, April 2014