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ELECTRICITY FAILLURE SMS ON MOBILE & AUTO CHANGEOVER TO EMMERGENCY SUPPLY

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ABSTRACT

Sometimes there is need of devices which should intimate us when power goes off, so that we could switch off our devices if they are battery operated or they are getting power from some other limited source such as UPS (uninterrupted power supply). This project can solve our purpose and can intimate us if power supply fails. And using this project we also get indication of power resume then also we can restore our system.

Keywords
UPS

1. INTRODUCTION

"Remote power failure Indicator" is designed to provide reliable monitoring of power supply to an equipment and if power supply is not available to the equipment it alerts the user by sending SMS and taking changeover to UPS / any other emergency power supply like DG .In most of the industries, colleges & hospitals we have some equipment which needs power 24X7 days. So it will be connected to a UPS system. In case if the Battery is about to dry and the power are lost then it becomes a problem. In such cases our panel monitors the power to such equipment and alerts the user when the power supply fails or when the system is running on UPS. So that the corresponding person can know that the system is running on

UPS and necessary actions can be taken. Our unit has provision to give alert, when the power is resumed. Also we can calculate any time, the time for what power is cut off and tie for UPS / Emergency supply is in running.

WORKING

In this project, we have used 2 MCB's one is for mains power supply MCB and another one is ups power supply MCB**.** When power is available (MCB 1 ON) then relay coil activated. So main load is on from mains power because we have connected the main load through relays NO contacts. Mains ON light indicates the available power. IF power failure condition occurred (MCB 1 OFF) then relay coil get deactivated main load disconnected from mains load & shifted on UPS supply because we are connected the main load parallel through replay NC contact. UPS ON lamp indicates the connected supply from ups. At the same time we have taken one NO contact from relay to give signal to Arduino about power ON or OFF. When mains supply ON then Arduino continuously sensing the low signal which is coming from GND pin of Arduino to NO contacts of relay to pin 2 of Arduino. When power failure(MCB 1 OFF) occur then relay coil get deactivated the low signal from Arduino GND pin to pin 2 of Arduino disconnected then Arduino send the signal to GSM module. Then GSM module send the SMS to the no Witch is stored in program GSM send SMS "MAINS CUT OFF" When power resumed (MCB 1 ON) again relay coil energized low Arduino's low signal resumed to pin 2 from GND pin. Then Arduino send signal to GSM module. Then GSM module send SMS to store no "power resumed". Global system for mobile communication (GSM) is a globally accepted standardfor digital cellular communication. GSM is the name of a standardization groupestablished in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.

Ciruit Diagram

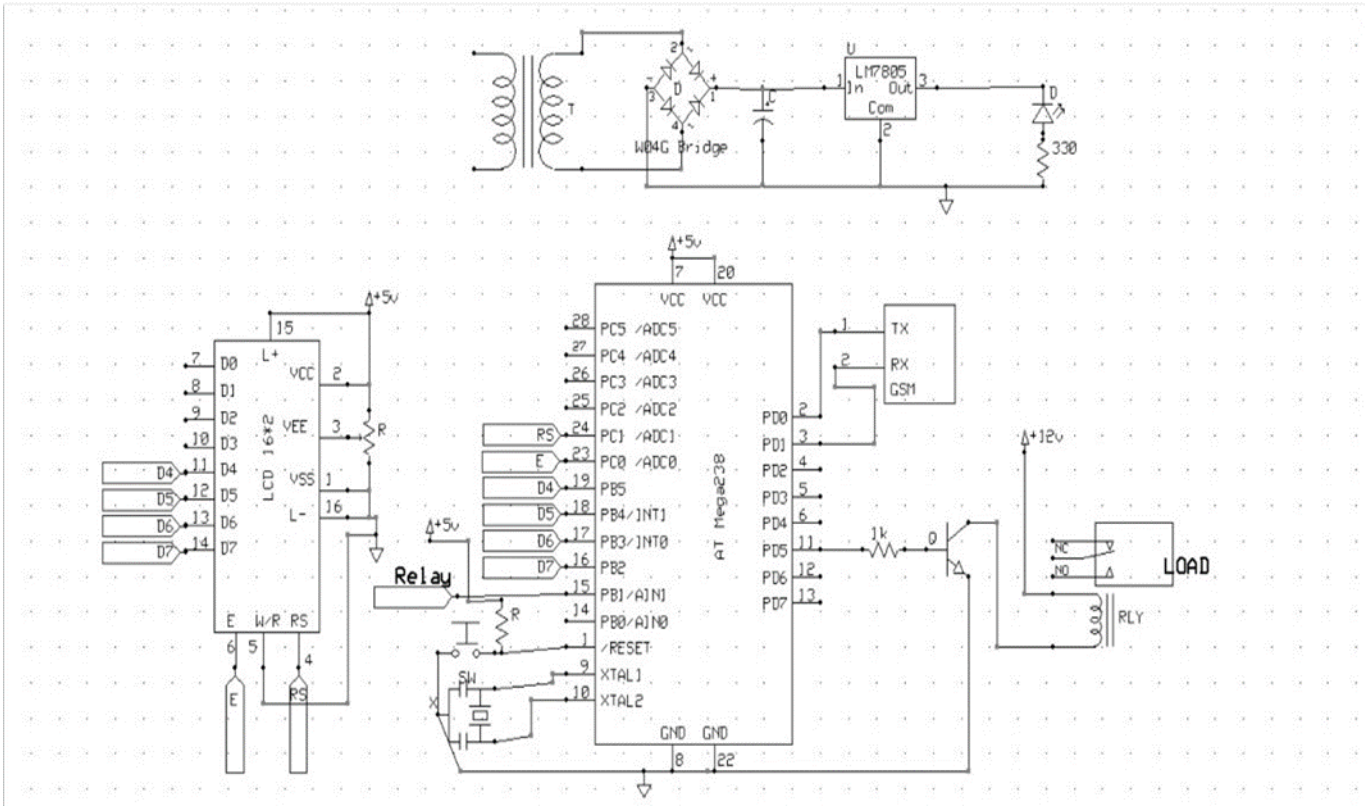

Fig.1 Circuit Diagram

From above circuit diagram, we seen that we have taken one relay, we have connected the mains supply and UPS supply from through the relays NO and NC contacts, also we have taken one NC contact out from relay for power ON/OFF signal to Arduino board.

Application and advantages

Application:-

1) This project can be used in home for planning work

2) The project can be used at hospitals by using this project they get indication & they can arrange the activities accordingly.

3) This projects can also use in commercials by using this they can easily plan for use the redundant power sources.

Advantages:-

1) Easy to installation.

2) Cost effective

3) Smart system for residential/ office area.

4) Easy to maintenance.

2. Problem Statement

We have you manually changeover switch or AMF panels for changeover from mains to other sources when power fails and vice versa when power restored, which is completed, need to operate at each time, can't keep records in case of AMF for power fail and resumed.

3. Objective

1. To full fill the purpose of when power off some devices that connected to power such as UPS are not going to off directly for some time and can intimate us if power supply fail.

2. Using this project we also get indication of power resume.

4. Scope of Experiment

1. We can provide voice feedback system.

2. We can send this data to a remote location using internet.

3. We can implement other related system we can operate pump from remote location at farm

5. Description of Experiment

This project helps us to organize our activities to reduce loss or any other problem because of the power failure event. We have used the relay module to switch over the MSEB power to UPS power in the event of power failure condition. At the same time in our project we used Arduino which will take signal from relay and gives command to gsm module to send SMS on mobile number on which we want indication.

- **Hardware components used**

1. ARDUINO UNO
2. GSM MODULE
3. MCB
4. INDICATION LAMP
5. 4 POLE, 230 VAC RELAY

COMPONENT DETAILS

➢ ARDUINO UNO

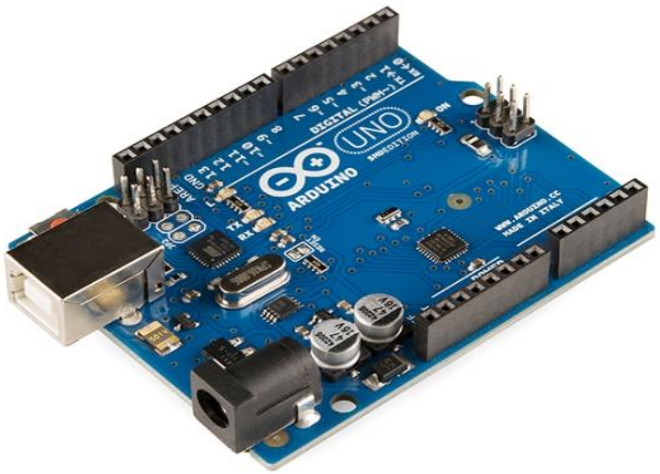

Fig 2. ARDUINO UNO

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

➢ **GSM MODULE**

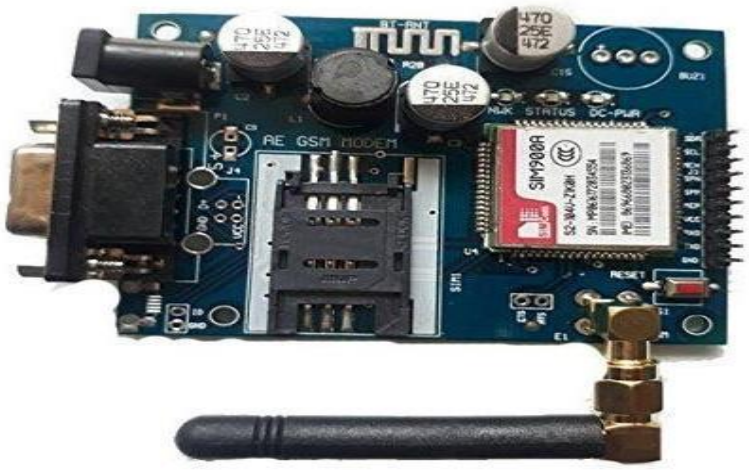

Fig 3. GSM Module

A GSM module or a GPRS module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system. The modem (modulator-demodulator) is a critical part here. These modules consist of a GSM module or GPRS modem powered by a power supply circuit and communication interfaces (like RS-232, USB 2.0, and others) for computer. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities. A GSM/GPRS modem is a class of wireless modem, designed for communication over the GSM and GPRS network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also, they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification. Cellular is one of the fastest growing and most demanding telecommunications applications. Today, it represents a continuously increasing percentage of all new telephone subscriptions around the world. Currently there are more than 45 million cellular subscribers worldwide, and nearly 50 percent of those subscribers are located in the United States. It is forecasted that cellular systems using a digital technology will become the universal method of telecommunications. By the year 2005, forecasters predict that there will be morethan 100 million cellular subscribers worldwide. It has even been estimated that some countries may have more mobile phones than fixed phones by the year 2000 (see Figure 4).

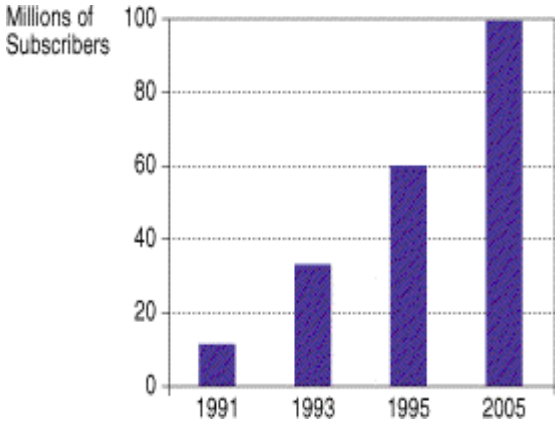

Figure 4. Cellular Subscriber Growth Worldwide

1. The MODEM needs AT commands, for interacting with processor or controller, which are communicated through serial communication.
2. These commands are sent by the controller/processor.
3. The MODEM sends back a result after it receives a command.
4. Different AT commands supported by the MODEM can be sent by the processor/controller/computer to interact with the GSM and GPRS cellular network

.

Its functions include:

- Read, write and delete SMS messages.
- Send SMS messages.
- Monitor the signal strength.
- Monitor the charging status and charge level of the battery.
- Read, write and search phone book entries.

➢ **MCB**

MCB i.e. Miniature Circuit Breaker is an electromagnetic device that embodies complete enclosure in a molded insulating material. The main function of an MCB is to switch the circuit, i.e., to open the circuit

(which has been connected to it) automatically when the current passing through it (MCB) exceeds the value for which it is set. It can be manually switched ON and OFF as similar to normal switch if necessary.

MCBs are of time delay tripping devices, to which the magnitude of overcurrent controls the operating time. This means, these get operated whenever overload exist long enough to create a danger to the circuit being protected. Therefore, MCBs doesn't respond to transient loads such as switches surges and motor starting currents Generally, these are designed to operate at less than 2.5 milliseconds during short circuit faults and 2 seconds to 2 minutes in case of overloads (depending on the level of current).

Fig 5. MCB

➢ INDICATION LAMPS

The indicator lamp has become something that many of rely on, on a day to day basis without ever even knowing that we do! An indicator lamp is a light that indicates whether power is on to a device or even if there is a problem with a circuit or if something is working properly. We see indicator lamps in everyday life and generally they make our life a lot easier.

Fig 6. Indication Lamp

➢ **4 POLE, 230 VAC RELAY**

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as Solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

Fig 7. 4 POLE, 230 VAC RELAY

5. Result

This Project has worked when the power fails its get on & get SMS on Register Mobile No. & give the power to the devices. After that when power supply is Resume then it's get off & then also we can restore our system.

6. Conclusion

I have concluded that from this project, I have solved the problem of manual changeover to operate each time. Also the problem in case of AMF to record, here we got SMS which is also record for power fail and resumed.

7. References

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