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DIESEL GENERATOR MONITORING BY USING GSM

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ABSTRACT

In the present era, the number of generator are manufactured and installed on the site. But the monitoring of the generator i.e. the quantity of the diesel also detection of the phase while working is not in condition. Therefore, to measure the quantity of the diesel, diesel indicator and detection of phase, phase detector is used. When the supply is interrupted then the message will sent to the owner that supply is interrupted and also when the diesel in the generator low or full then the message will sent to the owner and also shows that how much number of time generator has ON and OFF. For showing the generator on or off lamp is used and for sending the message GSM SIM 900A system has used. For that whole system Arduino Uno has used which included Atmega 328 microcontroller.

KEY WORDS: Arduino Uno, GSM module, ultrasonic sensor, Block diagram, flowchart, Proposed System.

INTRODUCTION:

Sensors are basically electronic devices. In this project ultrasonic sensor is used which indicate the level of the diesel which is used in the generator. But when the diesel in the generator is full or low in quantity and how much fuel used in generator at the time of starting has detect the ultrasonic sensor and send the message to the owner. Therefore it will reduce the theft of diesel. Also whenever the any phase of the system is interrupted then the massage has been send to the owner that the phase has interrupted and generator is on. This whole system is controlled by the arguing Uno which is the heart of the project. It has Atmega 328 microcontroller. The massaging action is performed by the GSM SIM 900 system which included 900MHz frequency. In this project the supply is step down by using step down transformer and after that supply is converted into dc supply by using rectifier unit and takes the fixed output by using regulator IC 7805, which produced fixed output of 5v.The output of the rectifier connected to the arduino Uno also the ultrasonic sensor and gsm unit is connected to arduino for satisfactory working of the project.

Arduino Uno: - Arduino Uno is the heart of the project because of the whole programming of the project is store in the microcontroller of arduino Uno i.e. atmega328p IC in c++ language with 2kb of SRAM and 1kb of EEPROM. It is 28 pin IC which has regulated power supply of 5v and 3.3v which handle a current of 50mA for 3.3v.Arduino has the ability that communicating with the computer as well as other arduino. It has transmitter and receiver pin which transmit and receive the data. In this system transmitting and receiving of data has been done by using these pin. The pin number 0 and 1 is used for that. It is powered up by 5v supply and it is able to operate on 5v.

Fig. Arduino Uno

GSM Module:- GSM is the global system for mobile communication which is the open source system. It is used for sending the massages, gprs also for calling purpose. But in our project GSM SIM 900A is used for sending the message to the owner when the any phase of the system is interrupted. It has the frequency of 900MHz.It has Vcc, Gnd, pin which powered up the GSM and Tx and Rx pin which transmit and receive the data. Whatever the massage is send to the owner is send by using GSM. It this system sim has to be put in the slot of GSM and after applying the single by arduino massage is sent via the GSM system. It produces a 2G data.

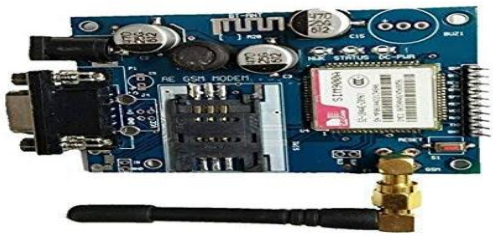

Fig. GSM Module

Ultrasonic Sensor:- In this project ultrasonic sensor is used for measuring the level of the diesel in the diesel generator. It is four pin sensor which has vcc, gnd, trigger and echo pin. This four pin introduces the measuring the level in the generator in centimeter. The ultrasonic sensor i.e. HC SR04 has the generates the ultrasonic waves at 40 KHz frequency. Trigger pin is an Input pin. This pin has to be kept high for 10us to initialize measurement by sending ultrasonic wave and echo pin is an output pin which goes high for a period of time which will be equal ken for the ultrasonic wave return back to the sensor.

Fig. Ultrasonic Sensor

LCD Display:- LCD is the liquid crystal display which interface to the arduino uno. Whatever the the send by arduno, LCD display shows on the display which is 16 * 2 display. In that display, there are three lines that RS, EN and RW which En is the enable pin which shows send the data. RS is the register select pin and when RS is low (0), the data is to be treated as a command or special instruction and another is the RW pin . The **RW** pin is the read or write control pin. When RW is low then information on the data bus is being written to the LCD.

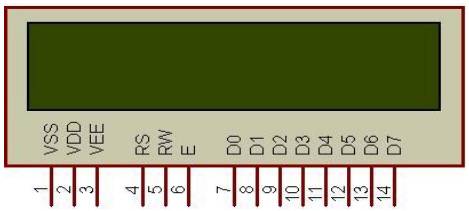

Fig. LCD Display

Block Diagram:-

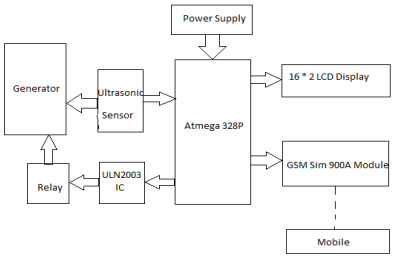

Fig. Block Diagram of Diesel Generator Monitoring

The block diagram shows how the sensor is connected to the microcontroller through an arrow, the arrow indicate that data is passing through the microcontroller. For satisfactory operation of the project ultrasonic sensor LCD display GSM module relay and IC's are interface to arduino. And ultrasonic sensor and the relay connected to the generator for measuring of level purpose. The interrupted phase and the level of diesel in the generator is shown in the LCD display and also send the massage via GSM.

Proposed System :-

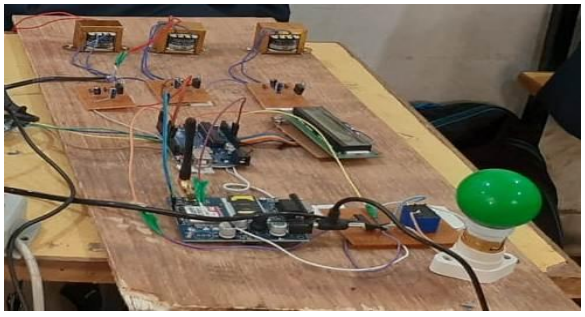

Fig. Proposed System Demo Kit

CONCLUSION:

Voltage sags and Harmonics are most important power quality problems affecting industrial and commercial distribution systems. The utility of sag and harmonic determination can improve system fault performance. The customers will have to improve the ride-through capability of their sensitive equipment by either power quality mitigation equipment or embedded solutions. It will be much more economical in the long term to improve the distribution system disturbances ride-through capability of the actual process equipment. In this paper have discussed the various power quality issues & detection methods such as RMS, Peak, Fourier Transform & Missing Voltage Methods.

Flowchart:-

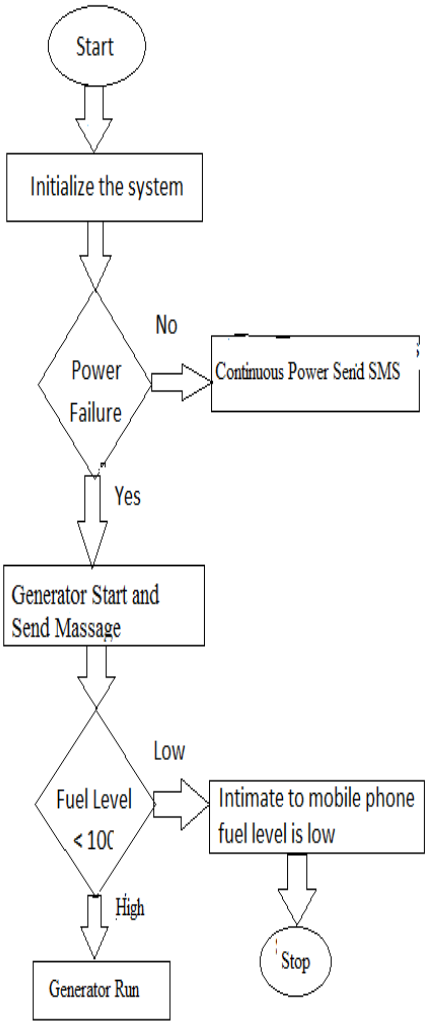

Fig. Flowchart of Diesel Generator Monitoring.

Output of System :-

Fig. Output of the System

*Conclusion:-*This project is aimed to developed a system which monitored the diesel in the diesel generator tank and also detect the live phase and start generator in the interruption of phase and it is done. This project is beneficial to the generator for measuring and also the theft of the diesel which shows via sending SMS.

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