

Fault Detection and Protection of Distribution Line

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ABSTRACT:

Detecting and locating faults in motors is very important role for healthy operation of motors. In electrical motors fault occur many times mostly because of the unreliable, overload condition. In this paper a novel concept using sensor for finding and locating fault which includes overload, short circuit and mostly line to ground fault in motors for better optimum operation of the system is now presented. In the proposed concept current transformer and potential transformer that could sense the faulty condition in motors, display to operator as well as send signal through Bluetooth module to main control panel. This is going to demonstrate with the help of hardware model and the results should be show the system have several features that make them an attractive instrumentation solution in electrical motor networks and also a viable tool for detecting fault in motors for its accurate fault detection.

Keywords:Arduino, Bluetooth, Current transformer, Potential transformer, Relay.

I. INTRODUCTION

Any distribution system is prone to fault and intermittency in power availability creates loss for the supplier as well as user majority a supply line can be effected by conditions of overvoltage and overcurrent .As well as under voltage condition. During the occurrence of any fault the incident goes unreported for long duration. Manual reporting can lead long outage time. To overcome this problem a Bluetooth based signaling system is developed that will detect the changes in voltage current parameters and using a Arduino based circuit, the fault can be detected based on comparison values obtained from rated parameters of the distribution substation. To overcome these we are proposing Arduino based fault detection and protection of distribution system.

If any fault occurs in the system then relay is used to switch off the main circuit breaker. And Arduino is give the message to the display the message on the main control panel. And GSM is detect the exact location of the fault due to this process fault finding and detecting of distribution line is easy as compare to other system.

II. BLOCK DIAGRAM

The system configuration of the proposed system is as shown in fig.1 in this configuration it involves Two Arduino, Two Bluetooth, Relay, Current transformer, Potential Transformer, Display, Two Motors.

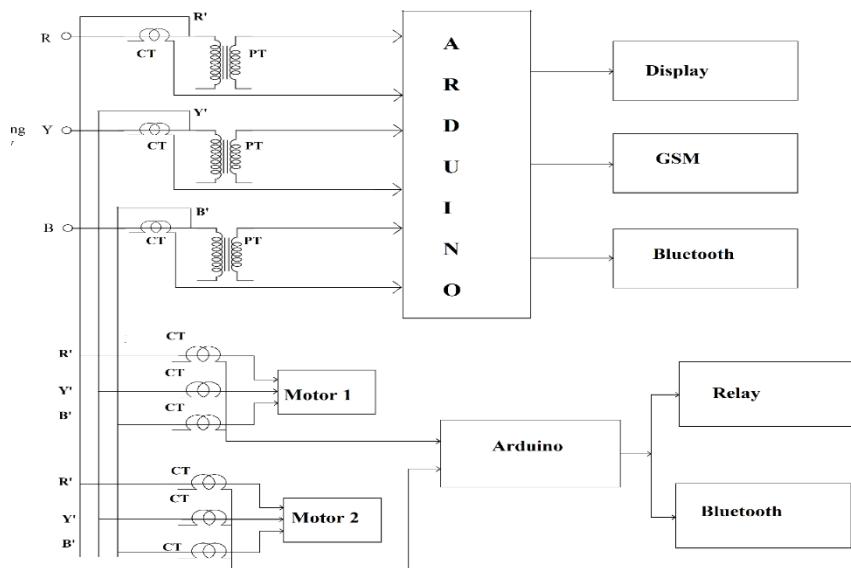


Fig.1. Block Diagram of Proposed System.

In our project we are presenting a fault detection and protection of distribution system done by our group. Above fig shows the block diagram of our project. From this block diagram we know that the main parts are Bluetooth and Arduinio. Arduino is an open source electronics platforms based on easy to use hardware and software. The relay can be used to operate a circuit breaker to switch off the main electric supply. Bluetooth is the main component of the project. Because of it send signal to the main control panel if any faulty condition in the motor. Current transformer and potential transformer that could sense the faulty condition in motor display to operator as well as send signal through Bluetooth module to main control panel. GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). GSM module requires one SIM card. The module works on 12V DC supply. By using GSM module we will detect the exact location of fault.

III. SIMULATION

In our progressive work we are presenting a simulation work done by our group regarding our project. In our progressive process we are designed our project operation on proteus simulation software are shown in below fig.

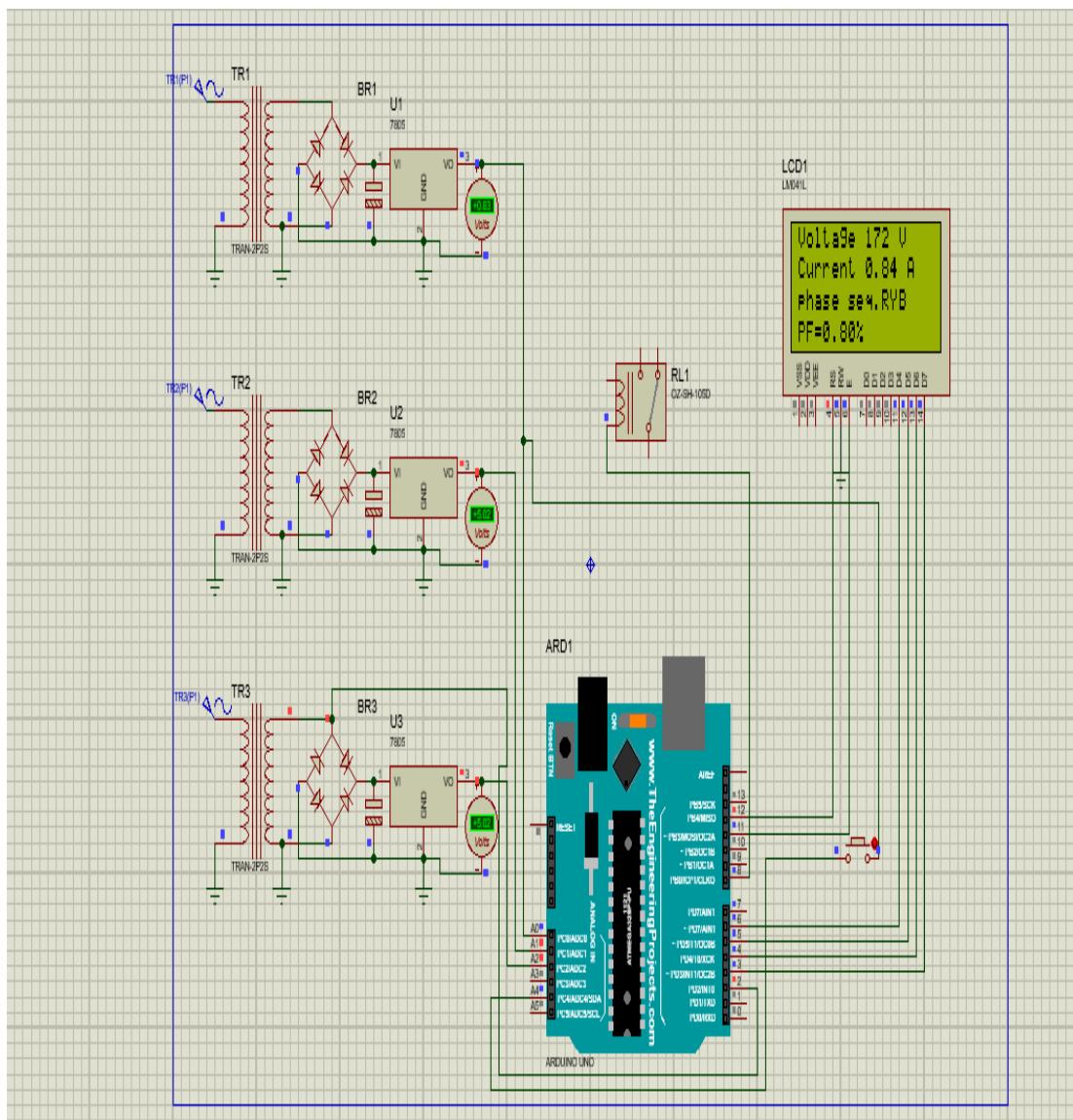


Fig.2. Simulation of Proposed System

Step 1: At starting 230V supply is given to the step down transformer which is reduce the voltage level up to 6V.

Step2: Then the normally 12V or 6V supply is given to the bridge rectifier and capacitor where it is converted from AC to DC.

Step 3: Then the output of the rectified and capacitor is given to the voltage regulator IC 7805 which is provide 5V supply.

Step 4: First three pins are connected directly to the Arduino pins A0, A1, A2. After that for frequency we required AC supply that's why we connect one line from step down transformer to the Arduino pin 2.

Step 5: Then pins of second side of Arduino is directly connected to display for monitoring electrical parameter.

- 1) Voltage
- 2) Current
- 3) Phase angle
- 4) Power
- 5) Frequency.

IV. FLOWCHART

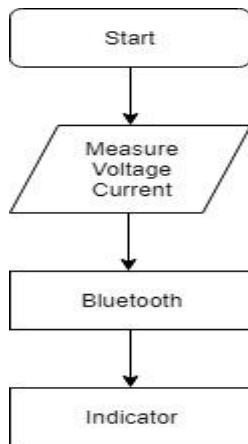


Fig.4. Flowchart of incoming supply side.

Above fig.4 shows the flowchart of incoming supply side. Here first we start the supply and measure the voltage and current at incoming side and display on the main control panel. After that we use one Bluetooth at incoming side. Indicator is used for indicate the electrical parameters on any faulty condition on the control panel.

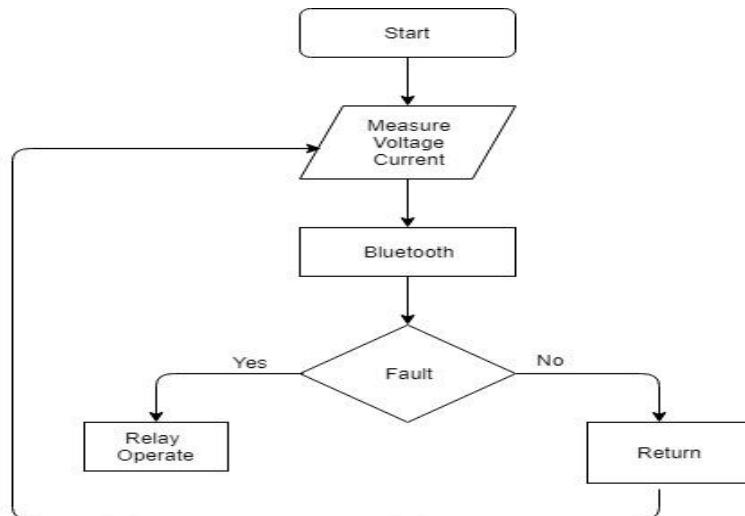


Fig.5. Flow chart of Motor side

As shown in above fig 5 it is the flow chart of the motor side. When supply is start it is measure the rated voltage and rated current. After that we use the Bluetooth which is used for sense the faulty signal and give the exact location of fault. If any fault is occur in the system then there will be relay operate and switch off the circuit breaker and gives command to the main control panel. If fault is not occur then system will be goes return back to continuously work.

V. CONCLUSION

The Fault Detection and Protection of Distribution Lines is very useful in industries. The most important advantages of this project is the fault finding is easy in distribution lines. Also maintain the phase angle. Fault clearance is easy and time required for the fault clearance is less. And also it locates or detects the exact location of the fault in the system.

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