Fault Detection and Location Finding In Power Transmission Lines

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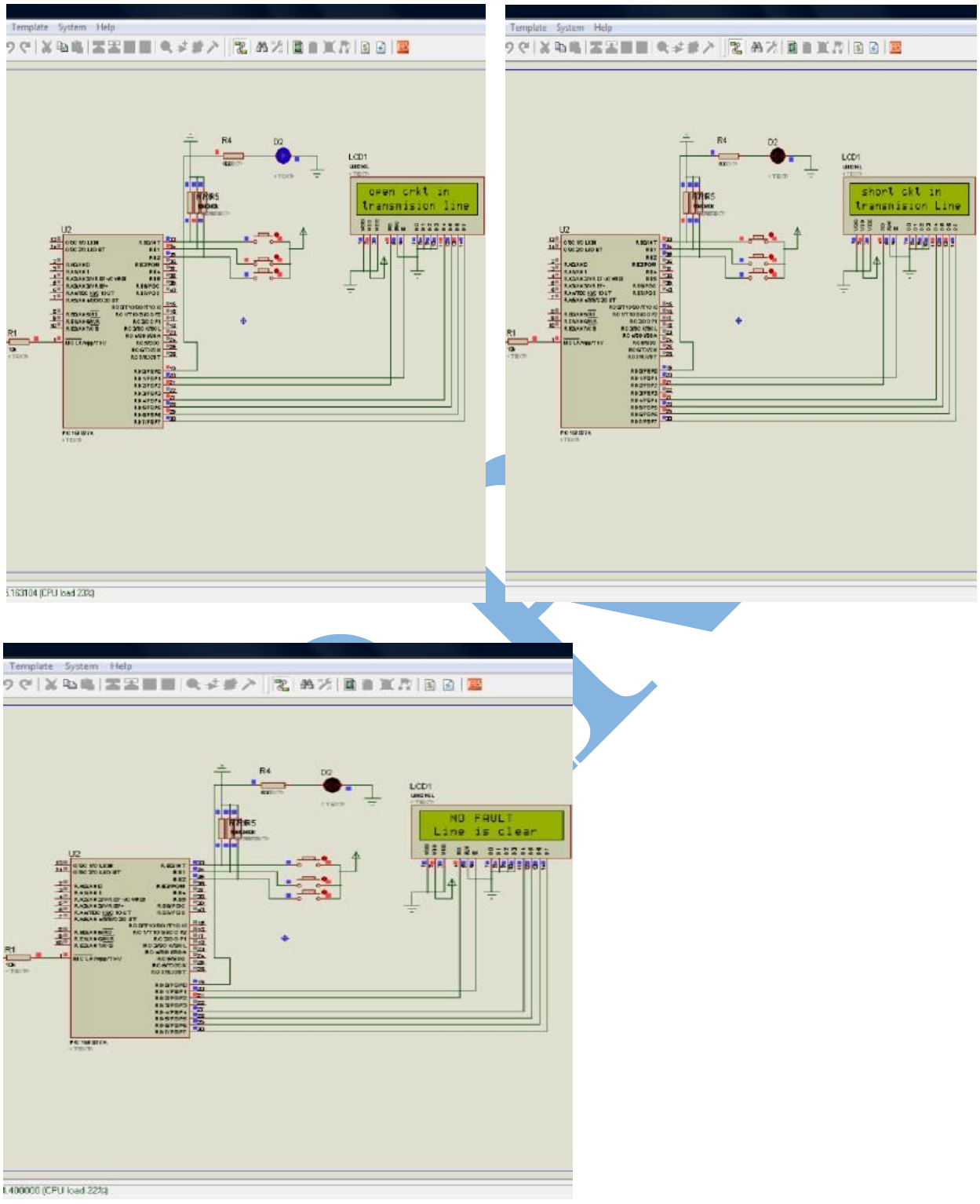
Abstract: **Electrical energy, nowadays, is the main commodity of our daily life. It is not only used in residential but also in commercial & industrial level. Due to vast usage of electrical energy it is most important to minimize the fault in the electrical power supply and ensure the smooth & continues flow of Electricity to the consumers, in addition to this if the fault occurs then to minimize the time required to identify the fault & its type to rectify it well in time ensuring the quick, continuous, and better supply to the customers Our project aim is the same as to assure quick identification & removal of faults in electrical power transmission lines by identifying & the type and location of fault.**
Several types of faults can occur in electrical power transmission lines and for finding them out, many methods and algorithms have been previously used. We have used Proton IDE language, Protius software, relays, receivers, microcontroller, transmitter s, step-down transformers and many other things which are easily available, cheap and reliable.

Keyword: Transformer, Relays Microcontroller

I. INTRODUCTION:

Electrical power distribution systems are responsible for supplying power to dispersed residential, commercial and small industrial customers in a safe, reliable and economical fashion. This is achieved by maintaining a reliable voltage level, correcting the power factor through use of reactive compensation and offering as close to continuous service as possible in order to meet demand. Service interruptions, although sometimes planned for, are to be minimized. However, it is the unplanned outage events, which are the focus of this thesis. Distribution system faults are most commonly short circuit or open circuit faults. These faults occur when one or more phases co me in contact with one another, the ground, or in some case both and can lead to temporary or permanent service outages. Many types of events including lightning flashover, animals, tree limbs and poor weather conditions, such as ice, high winds, and rain, are common causes of these service outages. Depending on whether any conductors, towers, or other parts of the infrastructure are damaged during such an event will determine whether a fault will cause a temporary or permanent service outage. It is therefore advantageous to detect and identify fault events as quickly as possible so that proper measures can be taken to restore service back to normal operating conditions.

II. CIRCUIT DIAGRAM



Circuits Diagram of Open circuit fault, Short circuit fault and No fault in transmission line

III. WORKING:

A fault clearing system consists of a relay protection system and a circuit breaker. In case of a fault, the task of the circuit-breaker is to clear the fault and the task of the relay protection system is to detect the fault. The circuit breaker has already been discussed in the previous chapter 3. It is important to understand that the time to clear a fault is dependent on both the time required to detect the fault and the time needed for the circuit-breaker to clear. We assume that sensors are randomly attached to different poles and all the sensors have not common transmission range. Here we use PIC16F877A microcontroller, which takes data from sensors (here sensors are relays) and on this data takes decision which is sent through transmitter to the receiver side. It consists of PIC microcontroller, receiver, mono pole antenna, LCD display. The receiver receives the signal give it to microcontroller and microcontroller show result on LCD display.

IV. CONCLUSION:

This thesis described the theory and method of fast fault detection and location using Wireless node. The concept of the open circuit fault and short circuit for a signal phase system was explored. This was followed by a presentation of the sensor locations. The program was written in proton id language and circuit was implemented in Proteus.

V. APPLICATION

Additional applications other than home music systems are possible. Intercoms are one possibility, with a separate transmitter and receiver located at each station. A microphone can serve as the source material and the system can act as a monitor for a nursery room. Background music may be added to existing buildings without the expense running new wiring.

VI. FUTURE WORK

Future research could be performed in applying these algorithms to more complete systems than the single transmission line which was used for analysis in this thesis. Additionally, other fault location algorithms most specifically, a fault location and classification scheme using the wavelet transform could be modified to make use of the fast fault detection. This will most likely improve the accuracy of fault location and increase the maximum detectable fault impedances.

VII. REFERENCES

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