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# A Unique Methodology for Transmission Line Breakage Detection and Alerting System

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**Abstract** - *Many times we read in newspapers that Humans & Animals die due to electrical shock in remote areas or in agricultural areas as contact with broken & hanging live supply wires. Safety circuitry of Distribution Company is inadequate and due to this line remains live with broken wires. Here we describe a modification to the existing power distribution system for wire break detection and a power supply breaking mechanism. Circuit breaker with shunt trip mechanism breaks the supply and avoids damages from electrical accidents due to overhead transmission lines conductor breakage problems. We utilize various communication devices to provide an indication of the number of voltages transmitted from one section to another.*

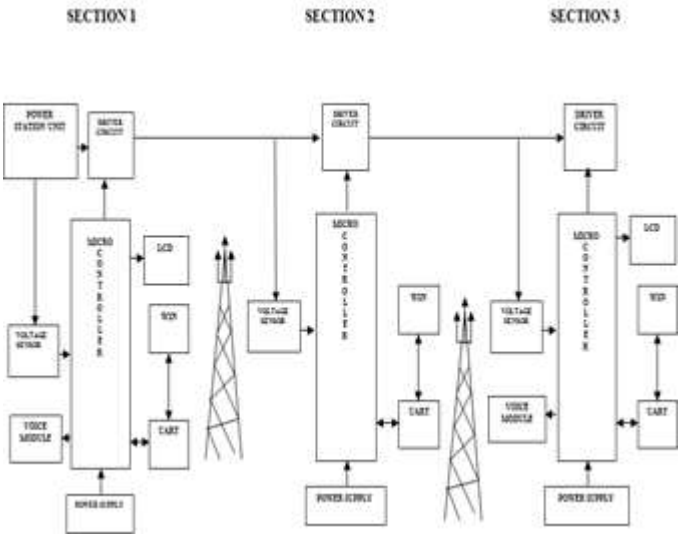
## I. INTRODUCTION

As of late, the control age and transmission limit have not expanded relatively to take care of the worldwide power demand. Despite the fact that producing limit and power exchange through transmission lines should be upgraded; in any case, the restricted vitality assets, deregulated power showcase, ecological limitations, time and capital required to construct new transmission systems has driven the framework organizers to search for the new strategies to enhance the power framework execution. Distance relay based protection is for the most part used for securing the transmission framework amid the deficiencies. These distance transfers attempt to locate the powerful impedance amid fault by estimating the basic part of voltage and current. The utilization of numerical relays began in mid-1980s, these microchip-based transfers are especially adaptable and were using different techniques, such as counting., to alleviate the impact of off base estimation of impedance in light of the utilization of first request differential line conditions. The algorithm which utilizes first order differential line conditions for impedance estimation requires the digital filter to extricate key parts and henceforth, initiates delay in the estimation of impedance. With the improvement of the shabby and quick chip, the defensive relay utilizations Discrete Fourier Transform (DFT) for estimation of impedance relating to the basic part. In the existing process, there is no automatic system for finding the power line break occurrence. Until now human needs is the only solution for finding those problems. To overcome this we are going to deal with the new techniques. Reference [1] proposes a fault locating and order procedure by consolidating wavelet change with particular esteem deterioration and Shannon entropy. In [2], a technique for finding the issues is proposed by using synchronized current phasor of a few branches. Correspondingly, a Euclidean standard of most extreme wavelet solitary esteem record is examined by [3] to recognize and order the flaws in HV transmission lines. These wavelet-based techniques may not be reasonable to recognize the asymmetry in the waveform since it uses the symmetric bit as their premise work. Synchronized voltage-current phasor's of wide zone estimation framework database and transfer choices are utilized to recognize the blamed parts [4]-[5]. The strategy proposed in [6] recognizes inward and outer blame for interconnected lines which uses the synchronized phasor estimations with rapid correspondence and exchange GPS innovation. The technique utilizes rapid correspondence, what's more, henceforth, may not be exceptionally savvy. For the protection of power system, it is alluring to have a more solid essential assurance conspire [1]– [3], as reinforcement security is incited after some defer which may result to instability based on working purpose of the pre-fault framework [4]– [6]. Additionally, the issue has a tendency to wind up more perplexing as the impedance estimated amid the blame might be incorrect because of the nearness of clamour, DC part, sounds and so on. Subsequently, there is a request to upgrade the ability of zonal based separation assurance by using more data about the waveform of the flag and a strong transfer setting parameters amid blamed and typical conditions.

## II. SYSTEM ARCHITECTURE AND DESIGN

In this system, we are continuously monitoring the power line disconnection due to any physical breakage in the cables. The first section consists of a Voltage sensor. The voltage sensor is used to measure the input voltage from the power station and that value is transmitted to the next section using WSN. The driver circuit is used to control the voltage from the power station to the next section. The next section receives the voltage level from the first section and measures

the input voltage from the first section. If both values are approximately the same, then it transmits the voltage to the next section. If a rapid change is found by the voltage sensor in the second section, then a signal is transmitted to the first section indicating that a rapid voltage change has occurred. And also the power if the second WSN section receives approximate voltage values from the first section, then the voltage is directed to the third section. Now the voltage received by the second section is transmitted to the third section using the driver circuit and also the voltage values of the second section is transmitted to the third section using WSN. Now the received voltage value is checked by the third section. If the received voltage is approximately equal, then there is no breakage in the circuit. If any change occurs then the WSN of the third section transmits a signal to the second section indicating that rapid change has occurred. Based on this signal, the voltage from the second to the third section is turned OFF by the controller. Whenever a change in voltage has occurred between any two sections then the respective buzzers connected with the sections start alerting the public. The statuses of the circuits are displayed on the LCD display.




1.1.Fig Block diagram

## III. HARDWARE SYSTEM

The hardware consists of PIC microcontroller which controls the overall process. It consists of a driver circuit which is the relay that trips the circuit whenever the fault occurs which is passed to the neighboring nodes using the transmitting module ZIGBEE and also to the server station. The incoming and outgoing voltages are measured continuously by using voltage sensors connected across each node. The VOICE IC MODULE which gives its output through a speaker is employed which plays role in intimating the public and making them aware of the faulted tower or line. This whole setup is placed at very transmission tower between the load and the generating station. Hence the interruption of power supply at the healthy towers shall be eliminated with increasing people's convenience. When the fault is corrected, the switch can be closed and hence the neighboring transmission lines before the faulted line gets the information that the fault is cleared which resets all lines to the normal working state. This system is efficient enough since the connection between the nodes is provided which helps in increasing the regulation of the system and avoids unnecessary power cuts to the loads connected.

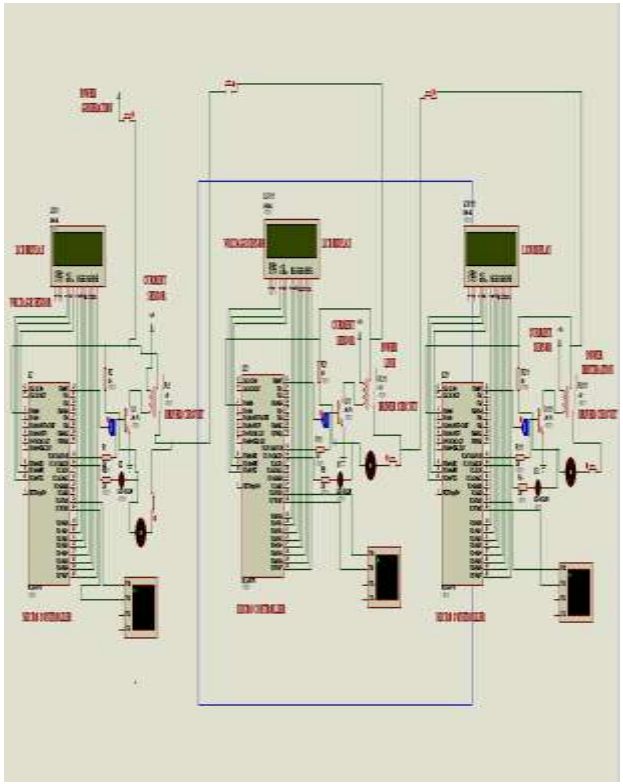
## IV. SIMULATION REQUIREMENTS

High-level language programming has long been in use for embedded-systems development. However, assembly programming still prevails, particularly for a digital signal processor (DSP) based systems. DSPs are often programmed in assembly language by programmers who know the processor architecture inside out. The key motivation for this practice is performance, despite the disadvantages of assembly programming when compared to high-level language programming. Embedded C is designed to bridge the performance mismatch between Standard C and the embedded hardware and application architecture. It extends the C language with the primitives that are needed by signal-processing applications and that are commonly provided by DSP processors. The design of the support for fixed-point data types and named address spaces in Embedded C is based on DSP-C. DSP-C [1] is an industry-designed extension of C with which experience was gained since 1998 by various DSP manufacturers in their compilers. For the development of DSP-C by ACE (the company three of us work for), cooperation was sought with embedded-application designers and DSP manufacturers. The Embedded C specification extends the C language to support freestanding

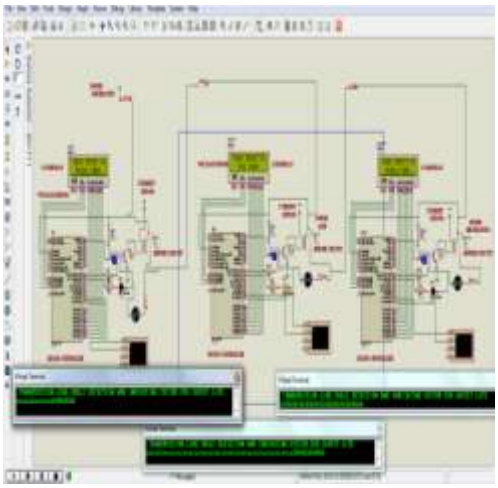
embedded processors in exploiting the multiple address space functionality, user-defined named address spaces, and direct access to the processor and I/O registers. These features are common for the small, embedded processors used in most consumer products. The features introduced by Embedded C are fixed-point and saturated arithmetic, segmented memory spaces, and hardware I/O addressing. The description we present here addresses the extensions from a language-design perspective, as opposed to the programmer or processor architecture perspective.

## V. DATA ASSIMILATION AND RECORDED RESULTS

The simulation results are displayed in the Fig.3 and Fig.4. The Fig.3 shows the output indication in the LCD attached to the microcontroller. The Source voltage provided to the voltage sensors is continuously sensed for any variation. The value of the source voltage is varied so that the controller detects the voltage abnormality. In such a scenario, the Fig.3 shows the output in the LCD screen. Fig.4. Shows the data which is transmitted by the microcontroller to the peripherals attached to it. A communication peripheral used here is a WSN. When the disruption occurs to any one of the transmission lines, then the communication signal is provided to all the transmission lines via WSN.



1.2. Circuit Diagram



1.3. Simulation window

1.4. Virtual terminal window

## VI. CONCLUSION

The system provides an efficient technique to avoid accidents due to the falling of over-head cable over humans and animals. This also provides an instant intimation to the Electricity Board (EB) and cut-off the outgoing Voltage signals.

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