Title**: UNDERGROUND CABLE FAULT DETECTION**

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Introduction

The primary goal of this paper is to determine the distance of the fault from the base station in kilometres (km). The central idea of this work is the simple concept of Ohm's Law. When a fault is detected, it is displayed on the Liquid Crystal Display (LCD). The main benefit of the proposed system is that the cables will not be affected by any adverse weather conditions such as pollution, snow, storms, heavy rainfalls, and so on. In today's computerised world, the proposed system assists in determining the exact position and location of the fault without wasting time or money, and it also indirectly prevents soil pollution. It is widely used in urban and metropolitan areas because it is difficult to find the exact location of a fault manually because it takes more time and money. Faults are

classified into two types: open circuit faults and short circuit faults. When there is no current flow, i.e. I=0, it indicates that the input voltage is equal to the output voltage. In a short circuit fault, the output voltage is zero but the current is constant. This paper assists cabling companies in improving their wiring and monitoring systems. The proposed system assists in identifying the fault without the need for manual entry, thereby saving many lives.

OBJECTIVE

Abstract Today, it is very challenging to manually find underground cable faults like wear and tear or rodents, because it costs more and takes more time. Finding the fault sources is also very difficult because the entire line must be dug to check for cable line faults. Our suggested system utilises an Arduino- microcontroller to help locate the fault's exact location. The standard concept of Ohm's law is applied in this system. The location of the shorted cable line determines the current flow when a low DC voltage is applied to underground cable lines at the feeder end through a series resistor. The system makes use of a rectified power supply and an Arduino- microcontroller board. The Arduino - microcontroller board is interfaced with a combination of resistors and current sensing circuits. the cable's length is represented by digital data that is sent from the internal ADC device to the microcontroller and displayed on the LCD Display.

METHODOLOGY

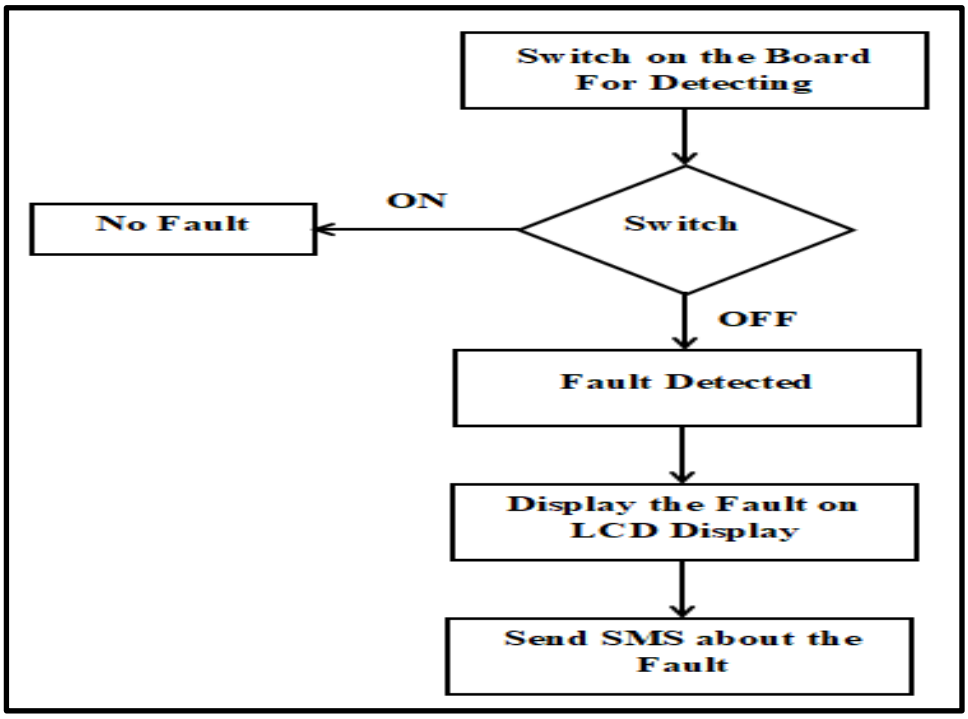

Figure 1 Flow Chart of Proposed System

Detecting faults in underground cables can be challenging, but an Arduino and GSM module can help. An Arduino board, a GSM module, and a power supply are required, and by inserting a SIM card into the GSM module, faults will be displayed on the LCD display, and any faults will be notified via mobile. R phase, Y phase, and B phase faults are shown in the proposed system at 2km, 4km, and 6km. This system includes an LED that indicates whether or not the board is receiving power. If it blinks, it indicates that the power supply is turned on; otherwise, it is not. In addition, the Arduino and GSM modules show the power status. The power supply for these is extremely straightforward. The GSM module is connected via D-type pins. The Arduino and GSM must be linked to the same device, which could be a laptop or a power bank. The network LED on the GSM will begin to blink once the sim is inserted. If the blink is fast, it means that the network is fast and catching up; if the blink is slow, it means that the network is slow. When the setup is finished, the system begins to function. If there is a fault in the R phase at a distance of 2 kilometres, the LCD display will show R PHASE 2 KM CABLE FAULT. The same message appeared on phone after we turned it off. The same is true for the Y and B phases.

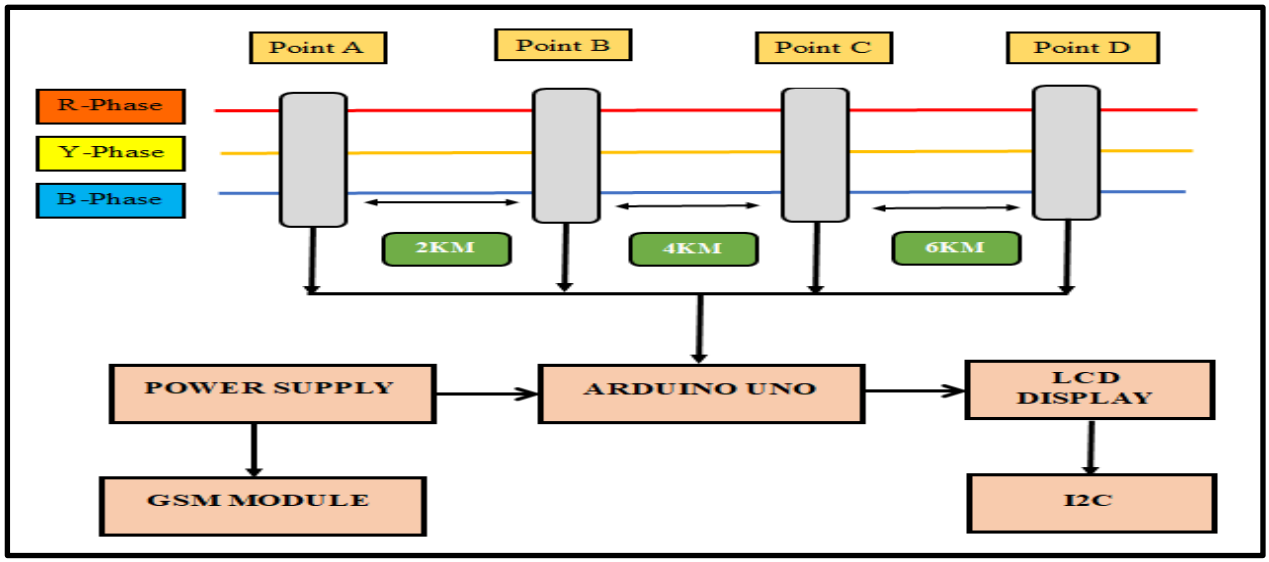

Figure 2 Block diagram of Proposed System

RESULTS & DISCUSSION

Figure 3 System Design of Proposed System

The above Fig.3. Shows that System Design of Proposed System, which is connection of Arduino-Uno, LCD display, GSM module and Cable lines.

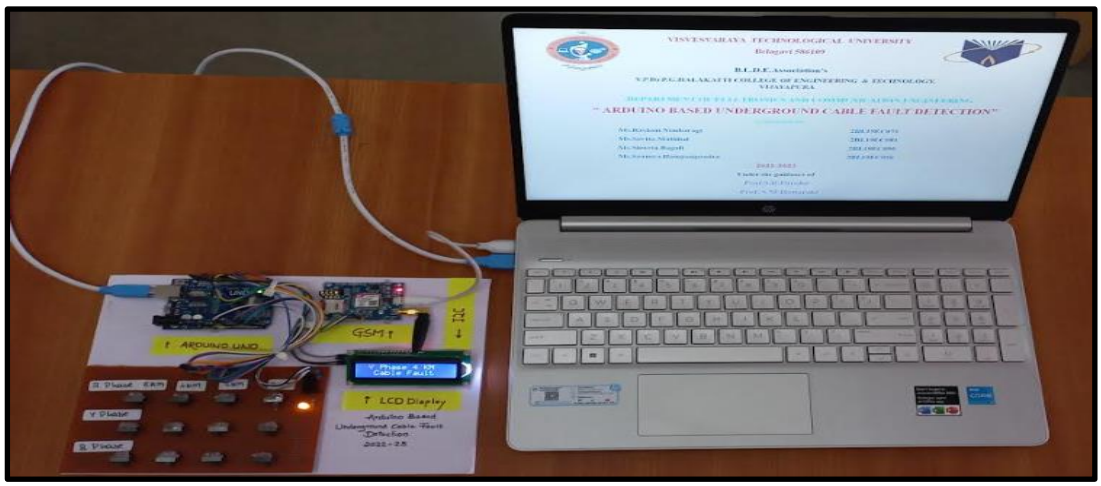

Figure 4 Working Module of Proposed System

The above Fig.4. Shows that Working Module of Proposed System,here blinking LED shows that Kit is ready for functioning.

Figure 5 Cable Fault Detected at B-Phase (8Km Distance)

In the above Fig.5. LCD display shows that , the cable fault is detected at B-Phase by the distance of 8kilometers.

Figure 6 Cable Fault Detected at Y-Phase (4Km Distance)

In the above Fig.6. LCD display shows that , the cable fault is detected at Y-Phase by the distance of 4kilometers.

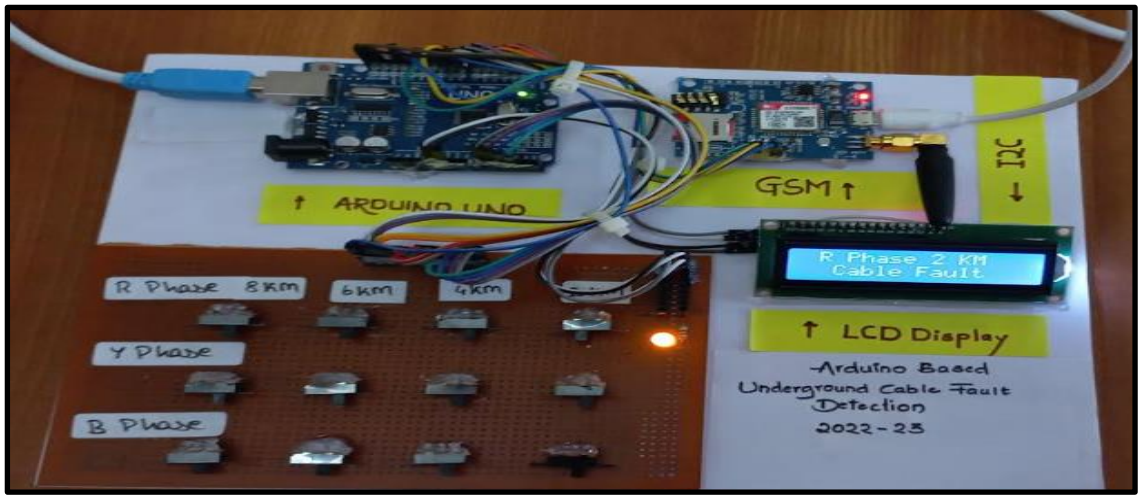

Figure 7 Cable Fault Detected at R-Phase (2Km Distance)

In the above Fig.7. LCD display shows that , the cable fault is detected at R-Phase by the distance of 2kilometers.

Conclusion

The proposed system achieves the desired outcomes. Arduino is used to detect underground cable faults. Where it consists of R,Y,B phases, we can find the precise location of faults displayed on the LCD. To make the system suitable for real-time use, components with a wider range must be used. In the future, it may be possible to use a capacitor in an AC circuit to calculate impedance and thus measure open circuit faulting.

FUTURE SCOPE

In this project we detect the exact location of short circuit fault in the underground cable from feeder end in km by using Arduino In this project we detect the exact location of short circuit fault in the underground cable from feeder end in km by using Arduino. In future, this project can be implemented to calculate the impedance by using a capacitor in an AC circuit and thus measure the open circuit faulting. In future, this project can be implemented to calculate the impedance by using a capacitor in an AC circuit and thus measure the open circuit fault.