# Under Ground Cable Fault Detection

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**Abstract**—The project is intended to detect the location of fault in underground cable lines from the base station to exact location in kilometers using an Arduino micro controller kit. In the urban areas, the electrical cable runs in undergrounds instead of overhead line s. Whenever the fault occurs in underground cable it is difficult to detect the exact location of the fault for process of repairing that particular cable. This paper proposes fault location model for underground power cable using microcontroller. The aim of this project is to determine the distance of underground cable fault from base station in kilometers.A set of resistors are therefore used to represent the cable and a dc voltage is fed at one end and the fault is detected by detecting the change in voltage using a analog to voltage converter and a microcontroller is used to make the necessary calculations so that the fault distance is displayed on the LCD display.

**Keywords :** Embedded System, GSM .

## INTRODUCTION

The objective of this project is to determine the distance of underground cable fault fro m base station in kilo meters using an Arduino board. Generally we use overhead lines. We can easily identify the faults but in rushed places or familiar cities we couldn't use overhead lines. So, we are moving to underground cables. Underground cables used largely in urban area instead of overhead lines.Th is proposes greatly reduces the time and operates effectively. The underground cabling system is a common practice followed in many urban areas. Many time faults occur due to construction works and other reasons. At that time it is difficult to dig out cable due to not knowing the exact location of the cable fault. it may also go through some types of faults. The common Fault in cables are represented as follows:

- Due to damage in isolation
- Breaking of conductor.
- .Weakness on the cable,that affect performance of cable.
- Inconsistency

## RELATED WORK:

Every cable has different resistance which depends upon the materia l used. The value of the resistance is depends upon the length of the cable. In here resistance is the leading role of the pro ject. If any deviation occurs in the resistance, the value of the voltage will be changed that particular point is called FAULT.Progra ms uploaded in Arduino UNO kit to detect faults from the underground cables.

**Block Diagram :**
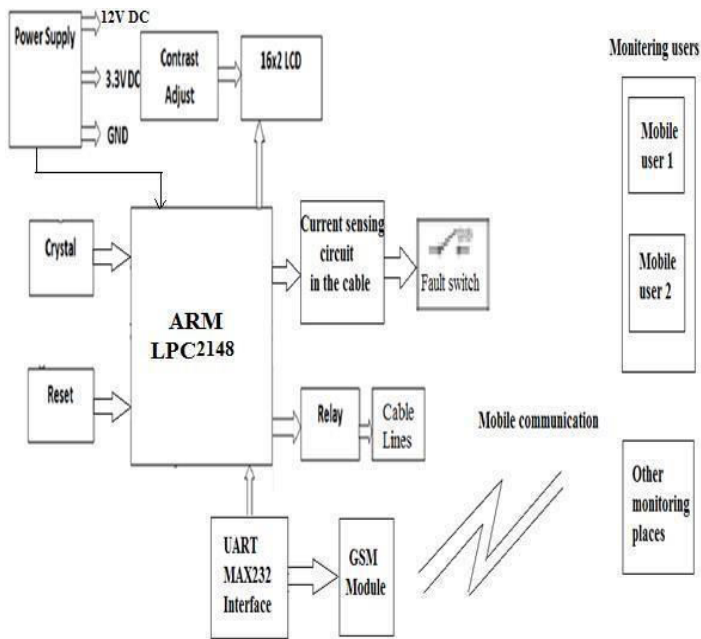
Block diagram of Underground Cable Fault Detection.

In this project design, prepared modular design concept is adopted and the system is mainly composed of a single microcontroller, relay, register, LCD, GSM, power supply, UART, MAX232, RS232.

### A.      ARM 7:
ARM7 the new smart vehicle security system integrated a lot of hardware modules such as wireless transmission .

### B.      MAX232:
MAX232 is used, which is recognized as line drivers. It convert the TTL levels to RS232 voltage levels and vice versa. MAX232 is that it use 5V power supply which is same as for microcontroller.

### C.      GSM
A GSM modem can be committed modem device with a serial, USB or Bluetooth connection or a mobile phone that provide GSM capabilities. It is a wireless modem that behaves like a dial-up modem

### D.      RELAY

A relay is an electrically operated switch. Many relays are use for an electromagnet to mechanically wark a switch.

### E.      KEIL software

KEIL Compilers are programs used to convert a High Level Language to objective code. Desktop compilers create an output object code for the primary microprocessor, but not for other microprocessors. I.E the programs written in one of the HLL like „C" will compile the code to run on the system for a specific processor like x86 (underlying microprocessor in the computer). For example compilers for Dos platform is dissimilar from the Compilers for Unix platform.

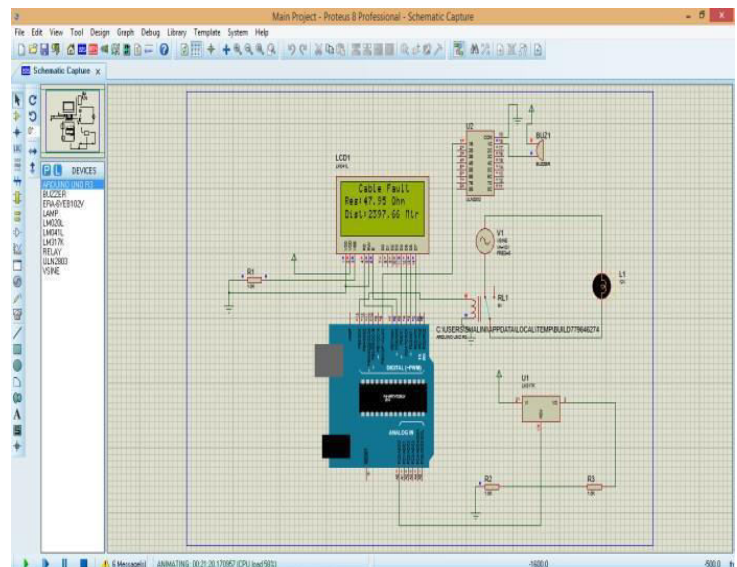**SIMULATION DIAGRAM:**

**SIMULATION DIAGRAM WITHOUT FAULT:**



**Figure.Simulation Diagram without Fault**
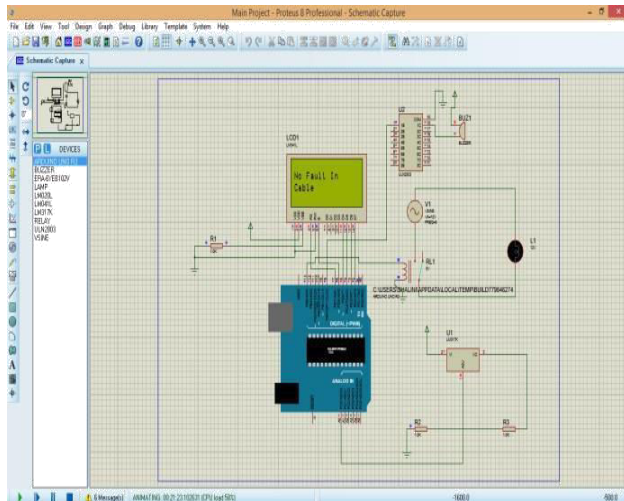
## SIMULATION DIAGRAM WITH FAULT:



**Figure.Simulation Di agram with Fault**

## SOFTWARE DES CRIPTION :

1. **ARDUINO SOFTWARE:**

2. **PROTEUS SIMULATOR:**

### ADVANTAGES

1) Protection against electromagnetic field radiation.
2) Lower maintence cost, fewer interrupt.
3) Lower tree-trimming cost.
4) Less maintenance
5) It has higher efficiency
6) Less fault occur in underground cable

### CONCLUS ION

In this demo model we can only measure the fault in the RYB cable within the range of 5KM distance but it can be extended to a long distance by using high precision equipment.

In this paper we detect the fault in the underground cable from feeder end in km by using ARM LPC2148 microcontroller. For this we use simple concept of OHM's law and voltage divider rule so fault can be easily detected and repaired.

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