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UNDERGROUND CABLE FAULT DETECTOR USING IOT

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Abstract-The objective of the project is to determine the distance of underground cable fault from base station in kilometers. The underground cable system is a common practice followed in many urban areas. When fault occurs for some reason, at the same time the repairing process is related to that particular cable is difficult due to not knowing the exact location of the cable fault. The proposed system is to find the exact location of the cable. The project uses the standard concept of ohm's law i.e., when a low DC voltage is applied at the feeder end through a series resistor (Cable lines), then current would vary depending upon the location of fault in the cable. In case there is a short circuited (line to ground), the voltage across series resistors changes accordingly, which is fed to an ADC to develop digital data programmed Arduino UNO microcontroller would display in kilometers. The project is assembled with a set of resistors representing cable length in KM's and fault creation is made by a set of switches at every known kilometers to cross check the accuracy of the same. The fault occurring at a particular distance and the respective output is displayed on LCD interface to the Arduino UNO microcontroller, and the data is given to the cloud using IOT.

Keywords- Arduino, LCD, Fault switches, IOT, Under ground cable, ohm's law.

I. INTRODUCTION

Till last decades over head cables were used. Currently underground cables which are superior to earlier method are in practice. Use of underground cable have got many advantages since they are not affected by any adverse weather condition such as storm, snow, heavy rain fall as well as pollution. But when any fault occur in underground cable, then it is difficult to locate fault. So it becomes necessary to find the exact location of fault. Since world has become digitalized the project is intended to detect the location of the fault in digital way. The underground cable system is more common practice followed in many urban areas. It is difficult to find while fault occurs for some reason, at the time the repairing process related to that particular cable is difficult because the exact location of the fault is not known the fault. Internet of things is network of physical devices connected to each other for exchange of data and information through sensors and actuators. Sensors could be temperature sensors, motion sensors, moisture sensors, air quality sensors, light sensors, you name it. These sensors, along with a connection, allow us to automatically collect information from the environment which, in turn, allows us to make more intelligent decisions. On a farm, automatically getting information about the soil moisture can tell farmers exactly when their crops need to be watered. Instead of watering too much (which can be an expensive over-use of irrigation systems) or watering too little (which can be an expensive loss of crops), the farmer can ensure that crops get exactly the right amount of water. This enables farmers to increase their crop yield while decreasing their associated expenses.

II. EXISTING SYSTEM

In general, fault location techniques for underground cable network can be categorized in two groups.

- Tracer method
- Terminal method

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PROBLEMS IDENTIFIED:

- The main drawback is that if a fault does occur, it is difficult to locate and repair the fault because the fault is invisible.
- Angular value required time to read so some delay occurs.
- Caused by braking of conductor & failure of insulation.
- Weaknesses or non-homogeneity that affects performance of cable.

III. SOFTWARE DESCRIPTION

ARDUINO IDE

The Arduino Integrated Development Environment is a cross-platform application that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

INTERNET OF THINGS

In short, the Internet of Things refers to the rapidly growing network of connected objects that are able to collect and exchange data in real time using embedded sensors. Thermostats, cars, lights, refrigerators, and more appliances can all be connected to the IoT.

IV. HARDWARE DESCRIPTION

POWER SUPPLY:

The 5V power supplies (or 5VDC power supplies) are one of the most common power supplies in use today. In general, a 5VDC output is obtained from a 50VAC or 240VAC input using a combination of transformers, diodes and transistors. 5V power supplies can be of two types: 5V regulated power supplies, and 5V unregulated power supplies.5V regulated power supplies come in three styles: Switching regulated AC to DC, Linear regulated AC to DC, and Switching regulated DC to DC. Unregulated 5VDC power supplies are basic power supplies with an AC input and an unregulated 5VDC output. The output voltage changes with the input voltage and load. These power supplies are inexpensive and extremely reliable.

ARDUINO UNO:

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP h

LCD:

An LCD consists of two glass panels, with the liquid crystal material sand witched in between them. The inner surface of the glass plates are coated with transparent electrodes which define the character, symbols or patterns to be displayed polymeric layers are present in between the electrodes and the liquid crystal, which makes the liquid crystal molecules to maintain a defined orientation angle. When the LCD is in the off state, light rays are rotated by the two polarizer and the liquid crystal, such that the light rays come out of the LCD without any orientation, and hence the LCD appears transparent. When sufficient voltage is applied to the electrodes, the liquid crystal molecules would be aligned in a specific direction. The light rays passing through the LCD would be rotated by the polarisers, which would result in activating / highlighting the desired characters.eader and a reset button.

V. CONCLUSION

In this paper we detect the exact location of short circuit fault in the underground cable from feeder end in km by using Arduino Microcontroller. For this we use simple concept of OHM's law so fault can be easily detected and repaired.

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