

# FAULT DETECTION IN UNDERGROUND CABLE BASED ON IOT

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**Abstract** - The IoT based underground cable error the detection system helps detect errors in a very simple way. Interior wires have been widely used with the development of the power system grid. Underground cables are prone to various errors because of underground conditions, degeneration, rats. Finding the source of the errors is difficult because the whole line has to be excavated to check for error on cableline. Re-workers know which part is faulty and which is the only place to be excavated find the source of the error. So you save a lot of time, money too allows to serve subway cables quickly. We use IoT technology that allows authorities to monitor and evaluate error via the internet. The system detects an error with the help separating network that may be installed across the cable. When a mistake is created by a thread, producing a certain voltage depending on the combination of network of resistors. This voltage is heard by the microcontroller and updated by the user. Information relayed to user distance to the corresponding voltage. Small controller detects cable data errors and displays this data above LCD display, transmits this data online to display online. Thing Speak is developing an online interactive system with an online cable error display program.

**Keywords:** IoT, switches, Sensors, Wi-Fi module, Relay, LCD Display

## 1. INTRODUCTION

Power supply networks are constantly growing and their reliability is very important than ever before. The complexity of the whole network has many limitations fails and interrupts the end user's power supply. For many who work underground around the world power lines and power lines, underground cables used for many decades. Underground cables are widely used and because they do not work influenced by weather, heavy rain, storm, snow, and pollution. Even though Cable production technology is slowly evolving; there are still influences may cause the cable to fail during testing and operation. The cord is in good condition and plugged in well it can last a life of about 30 years. However the cables can be easily damaged by improper installation or misalignment, while injuring another person that follower public works such as watering or preventing encroachment

## 2. BASICS OF IOT

IoT allows devices to be remotely controlled across the Internet, thus providing opportunities to connect and integrate the physical world into computer based applications using sensors and the Internet directly. Connecting these multiple embedded devices will lead to automation in almost all fields and enable advanced applications. This results in improved accuracy, efficiency and economic benefits by reducing human intervention

## 3. METHODOLOGY

Many methods are made by cable error discovery a few decades ago. We usually use top lines. It can easily point out mistakes but is quick typical places or cities we cannot use the top lines. Therefore, they moved to the underground ropes. In this paper it uses IoT technology that allows authorities to monitor and evaluate errors via the internet. The system detects an error with the help of a separating network that may be installed across the cable. Whenever an error is created when two lines are shortened together, a certain energies are generated according to a network of resistors combination. Since the existing system does not work properly, this the paper proposes an IoT-based system. The purpose of this project to find the underground cable range error from base station for miles using IoT Gecko platform. The underground cable system is used for many purposes urban areas. Various ways to find faults like segmentation methods, acoustic acquisition method, Murray loop methods are not widely used because they are annoying lack of many. The segmentation method cannot be used because it is an intelligent view of the earth phase cable impossible. The acoustic method can be it is a disaster during the rainy season and very difficult and. Murray loop method is based on the Wheatstone goal and because of the different opposition of tracks

#### 4. HARDWARE COMPONENTS

##### PIC CONTROLLER:

PIC microcontroller (Programmable Interface Controllers), electrical circuits can be configured to perform multiple functions. They can be set to timeline or to control production lines and much more. They are found in many electronic devices such as alarm systems, computer control systems, telephones, virtually any electronic device. Many types of PIC microcontrollers are available, although the best may be found in the GENIE list of configured microcontrollers. These are designed and implemented by Circuit Software. PIC Microcontroller is cheap and can be purchased as pre-built circuits or as kits that can be assembled by the user.

##### RECTIFIER:

A rectifier is an electrical device that converts alternately Current (AC), which periodically reverses direction, to direct Current (DC), which flows only in one direction. Process this is known as correction, because it "straightens" the direction. Of the present. Physically, rectifiers take many forms, Vacuum tube diodes, mercury-arc valves, including stacks Copper and selenium oxide plates, semiconductor diodes, Silicon-controlled rectifiers and other silicon-based Semiconductor switch.

##### TRANSFORMER:

A transformer is a stationary device that transfers electrical energy from one circuit to another through electrically coupled conductors to the coil of the transformer. A changing current in the first or primary winding creates a different magnetic flux in the core of the transformer and thus a different magnetic field through the secondary winding. This different magnetic field induces a different electromagnetic force (EMF) or "voltage" in the secondary winding. This effect is called reciprocal induction

##### RELAY DRIVER:

A rely driver circuit is a circuit which can drive, which are experienced, another is that it can re-run the same way on funirtitin. Conducted reliefs are working again and in the resumed time, still needs to be met, and think about it.

##### LCD

An LCD is a flat-panel display or other electronically modified optical device that uses light-modified properties of liquid crystals. Liquid crystals never emit light directly instead of using a backlight or reflector to create a picture in color or monochrome. Every pixel a LCDs usually consist

of a layer of molecules between two transparent electrodes and two polarizations Filters the axes of transmission which are perpendicular to each other.

##### REGULATOR

A voltage regulator IC maintains the output voltage at a constant value. This is a popular voltage regulator integrated circuit (IC), a member of the 78xx series of fixed linear voltage regulators used to maintain such fluctuations. Xx in 78xx indicates the output voltage. This IC provides a +5 volt regulated power supply with provisions to add a heat sink.

##### BLOCK DIAGRAM

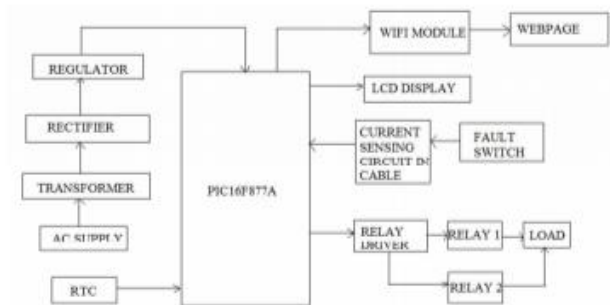


Fig: Block Diagram

#### 5. SOFTWARE SPECIFICATION

##### C LANGUAGE

A programming tool or software development tool is a program or application that software developers use to create, debug, maintain or otherwise support other programs and applications. The term usually refers to relatively simple programs that can be along with application and system software. C is a general-purpose, imperative computer programming language, supporting structured programming, lexical variable scope and combined together to accomplish a task, much as one might use multiple hand tools to fix a physical object.

##### EMBEDDED C

Use of microprocessor-specific assembly-only as the programming language reduced and embedded systems moved onto C as the embedded programming language of choice. C is the most widely used programming language for embedded processors/controllers. Assembly is also used but mainly to implement those portions of the code

where very high timing accuracy, code size efficiency, etc. are prime requirements.

## 6. THINGSPEAK

These devices are capable of interacting with one another directly or indirectly. Data collection is performed locally or remotely via centralized servers or cloud based applications. These devices may be data collection devices to which various sensors are attached such as temperature, humidity, light, etc., or they may be data actuating devices to which actuators are connected, such as relays. IoT systems use a combination of Internet and short-range networks based on the communicated parties. Short-range communication technologies such as Bluetooth and ZigBee are used to carry the information from perception devices to a nearby gateway. Other technologies such as Wi-Fi, 2G, 3G, 4G, and Power line Communication (PLC) carry the information for long distances based on the application.

## 7. CONCLUSION

The paper IoT based underground cable line fault detection system was executed successfully. Which makes fault detection very easier. It can clearly determine the location where the fault is occurred. The repair man only need to dug the place where fault is occurred. This paper enables the researchers to detect and locate the faults in underground cable with the help of IoT Gecko. Hence, the method used in this paper operates in a sequential manner and proves to be useful in detection and location of faults in underground cables.

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