

Underground Cable Fault Locator Using Microcontroller

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Abstract: *Underground cables are used for electrical power transmission from the power system grid to substations and consumers especially in city and densely populated areas such as railway stations, hospitals, airports etc. In underground cable systems, cables are positioned under the surface. Generally, the process of detecting the underground cable fault is complex, time-consuming, and costly. When any fault occurs, identifying, and tracking the source of the fault is complicated because the entire line is to be drilled to inspect the cable line fault. This paper presents a microcontroller-based underground cable fault identification and tracking system using GSM and GPS techniques. The purpose of this research is to develop a microcontroller-based smart and time-convenient design for the detection of the underground cable fault. Underground cables are widely used in urban areas for power distribution due to their safety, aesthetic, and space-saving advantages. However, locating faults in these cables is challenging and time-consuming because the cables are not visible. This project proposes an Underground Cable Fault Locator System using a Microcontroller, which can detect the exact location of a fault in the underground cable. The system operates based on the Ohm's Law principle, where the cable's resistance is proportional to its length. A DC power supply is applied to the cable line, and in the event of a short circuit or open circuit, the voltage drop across the cable changes. The microcontroller measures this voltage drop and calculates the distance to the fault using pre-calibrated values. The core components of the system include a microcontroller, voltage sensing circuit, LCD display, and relay driver circuitry for safety control. The calculated fault distance is displayed on the LCD in real-time, helping maintenance teams quickly locate and fix the fault without unnecessary excavation.*

Keywords: Underground cables

