# Design and Development of a Cable Heat Detection and Early Warning System for Low Voltage Electrical Panels Through Real-Time Telegram Notifications


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## *ABSTRACT*


*Fires can occur due to various factors, with short circuits being one of the most common causes. One of the challenges in detecting fires caused by short circuits is that they are difficult to detect in the early stages. This device is designed to detect the temperature rise in cables. The PZEM-004T V.3 sensor and LM35DZ temperature sensor are used to measure the voltage, current, and temperature of the cables. The Telegram bot then sends status updates regarding the temperature, voltage, current, and temperature readings after the cable temperature exceeds safe levels. The highest average temperatures recorded for NYA cables with diameters of 2.5 mm, 1.5 mm, 0.75 mm, and NYAF 0.5 mm were 29 ºC, 28 ºC, 29 ºC, and 34 ºC, respectively. The Telegram bot sends messages when the cable temperatures are within normal limits, as the phase temperatures R, S, or T do not fall below the minimum threshold of 25 ºC or exceed the maximum threshold of 40 ºC. The average message delivery time for the Telegram bot in the laboratory-based testing was 20.4 seconds, 17.5 seconds, 22.4 seconds, and 19.7 seconds.*



***Keywords****: Temperature, PZEM-004T Sensor, Telegram*