



A Review of Electric Line Man Safety Using Breaker with Android App Password Based Circuit

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ABSTRACT:

The escalation of critical electrical accidents involving line workers during electric line repair has underscored a pressing need for improved safety measures. These incidents are often attributed to inadequate communication and coordination between maintenance staff and electric substation personnel. This review paper presents an innovative project designed to mitigate these risks and ensure the safety of maintenance staff, specifically the line workers. The core feature of this proposed system is its ability to grant control over the activation and deactivation of electrical lines exclusively to the line workers. This empowerment is facilitated through the implementation of a password-protected mechanism for operating the circuit breaker, thereby allowing only authorized personnel to initiate ON/OFF operations. By adopting this system, the project aims to significantly reduce the incidence of electrical accidents during repair and maintenance work, ultimately safeguarding the lives and well-being of line workers. This paper delves into the comprehensive design and implementation of this safety-oriented solution, providing an in-depth analysis of its functionality and the potential benefits it brings to the realm of electrical infrastructure management.

INTRODUCTION:

This project is engineered to advance the safety and security of electrical operations, particularly in the context of circuit breaker control, by implementing a password-based access system. This innovative system is underpinned by the exclusive control and oversight of a microcontroller belonging to the esteemed 8051 family. A pivotal element in this system is the integration of a Bluetooth device with the microcontroller, allowing password input via an Android smartphone interface. The entered password undergoes a rigorous comparison with the stored password in the microcontroller's Read-Only Memory (ROM). Only when the entered password aligns with the stored authentication data can the circuit be initiated or deactivated, a state change that is visually indicated by an indicator lamp. Moreover, this project exhibits promising prospects for future enhancement through the integration of Electrically Erasable Programmable Read-Only Memory (EEPROM). This prospective development would empower users to modify their passwords, fortifying the security and interactivity of the system. Such an evolution not only extends the capabilities of the system but also augments its capacity to adapt to evolving security requirements in an ever-changing technological landscape. Electricity is an indispensable energy source, but it poses significant risks, particularly for professionals working in the field, such as electric line workers. Ensuring their safety is paramount, and one key safety measure is the use of circuit breakers, which provide the ability to disconnect power in a controlled and efficient manner. This project focuses on enhancing this safety aspect by integrating a password-based circuit breaker system with an Android application.

LITERATURE SURVEY:

1.Electric Line Man Safety with Password Based Circuit Breaker and Intimation of HT Wire Sag using GSM Pramod M. Murari, 2Mahabal V. Kinnerkar,3Prashant S. Koppa,4Vishal S. Kamble,5Rashmitha R. Mendan 1Assistant Professor, 2,3,4,5Student Department of Electrical & Electronics Engineering Hirasugar Institute of Technology Belagavi, India

It can work on a single given known password.No other person can reclose the breaker until the stored password is entered. It gives no scope of password stealing. It is effective in providing safety to the working staff. It is economical and it can be easily installed. Whenever the HT wire sag is higher than the predetermined range/value then ultrasonic sensor sends a message to the substation through GSM and intimates the operator about the trouble occurred. PIR sensor provides safety to human/animal by sensing their presence and alerting through a buzzer.It can be concluded that the proposed system can be used as an effective application in the present working system and provides safety to lineman and also corrective measures can be taken after HT wire sag intimation.

2.PROTECTION FOR ELECTRIC LINEMEN USING MOBILE APPLICATION WITH CODE BASED CIRCUIT BREAKER Vaibhavi Purohit¹ Rohit Kamble , Vivek Bhui³, Suraj Patil,Sunil Salaskar, Om Chougule⁶,Asst.Professor,Electrical Engineering, AMGOI Vathar, Maharashtra, India

This paper provide outline of project which have purpose to provide protection of an electric man, the project is programmed to monitor the circuit breaker using a password. Because of a loss of coordination and an interaction between the maintenance workers and the electric substation staff, serious electrical injuries to linemen are on the rise during an electric line repair.

3.Password Based Circuit Breaker For Line-man Safety Ashish Prasad¹, Milind Kumar Sahu, Sindhu Suresh Kumar, Srijan Mishra⁴, Tikeshwar Prasad Student, Dept. of Electrical Engineering, Shri Shankaracharya Technical Campus, Bhilai, Chhattisgarh,India

this system offers a solution to ensure that only the lineman has control over the electrical line, minimizing the possibility of unauthorized interference. The project, titled "Password-Based Circuit Breaker for Lineman Safety," demonstrates the use of an Arduino Uno microcontroller to reduce fatal accidents among linemen during repairs. As technology advances, it is vital that human safety remains a priority. Our project is grounded in this philosophy and has successfully met all requirements outlined in our work. The ultimate goal is to eliminate fatalities among linemen.

4. Password Based Circuit Breaker Using Arduino 1Rakesh Narvey, 2Rahul Sagwal, 3Abhishek katroliya, 4Vipin Jain, 5Hari singh sikarwar , 6Krisnakant 1,2,Assistant professor 3,4,5,6,UG Students, Department of Electrical Engineering MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR

In the recent years, researches have be focusing their work in the area of staff safety Maintenance of fault in electrical Line has always been a challenge to the lineman. The safety and supply control system have to be upgraded to provide a better safety to the maintenance staff. Time and again there have been innovations in the control of circuit breaker and other control system technologies for the secure and smooth functioning of substation and its staff.

Methodology of solving Identified problem with action plan :-

1.Planning:

Explanation: In the planning phase, the project's objectives, scope, and timeline are established. A comprehensive project plan, including roles and responsibilities, is created to guide the project's execution.

2. Identified & Defining the Required Resources for the Project as Software & Hardware:

This stage involves identifying and specifying the necessary software and hardware resources for the project, ensuring that they align with the project's objectives and functionality requirements.

3. PCB Designing:

PCB design refers to the process of creating the layout for the Printed Circuit Board, which is a critical component in the project. It involves defining the board's circuitry, components, and connectivity.

4. Implementation & Coding:

Implementation and coding encompass the development of the project's software components, including the password-based circuit breaker system and the Android application. This phase integrates software with hardware for the system to function as intended.

5. Testing:

The testing phase is vital for validating the functionality, security, and reliability of the integrated system. It involves rigorous testing, issue identification, and resolution to ensure a robust system.

6. Development & Maintenance:

Following successful testing and deployment, the project transitions into a development and maintenance phase. This involves ongoing monitoring, data collection, and improvements based on real-world usage. It also includes the creation of user documentation and a plan for future support and updates.

PROPOSED SYSTEM:

The project at hand introduces a secure and efficient password-based circuit breaker system, integrated with an Android application. The core concept revolves around the establishment of a secure connection between the electrical circuit and a designated Android interface, thereby enabling control through the input of a password. The primary motivation for this innovative system arises from the escalating number of fatal accidents involving line personnel, predominantly stemming from electric shocks. These unfortunate incidents are often attributed to a breakdown in communication and coordination between maintenance staff and the employees at electrical substations. One of the major challenges addressed by this project is the prevalence of fatal accidents, particularly affecting line men. These accidents arise from inadequate coordination between maintenance personnel and substation staff, which often leads to unsafe working conditions and inadvertent energization of circuits during maintenance activities. These occurrences pose a

significant threat to the lives of line men, necessitating the implementation of effective solutions to mitigate these risks. The project presents a comprehensive solution to rectify the aforementioned problem and ensure the safety of line men. The fundamental premise is the centralization of circuit control at the substation. Line men gain access to the circuit control by entering a predefined password. This password-based system empowers line men to securely deactivate the circuit, facilitating safe maintenance work. After the necessary repairs, the line man can return to the substation to reactivate the circuit, requiring the entry of the password once more. This two-step authentication process, controlled by the line man himself, virtually eliminates the possibility of accidents.

Key Parts: - Microcontroller, Relay, Relay driver, Rectifier, Bluetooth module, Ac supply Resistor, capacitor

Problem Statement:

The safety of electric line personnel engaged in the maintenance and repair of electrical systems is of paramount concern, as they often operate in hazardous conditions. The existing safety measures, including traditional circuit breakers, while effective to a certain extent, lack the advanced security and remote control capabilities necessary to ensure the utmost safety and efficiency in electrical maintenance procedures. Additionally, there is a pressing need to enhance the control and monitoring of power distribution systems, especially in emergency situations. To address these critical safety and operational challenges, this project aims to develop and implement a novel solution: a password-based circuit breaker system integrated with an Android application. The project seeks to investigate, design, and implement this integrated system, ensuring both the safety of line personnel and the efficient management of electrical systems.

CONCLUSION:

In response to the imperative need for heightened safety measures in the field of electrical line work, the project "Electric Line Man Safety Using Password-Based Circuit Breaker with Android App" presents a pioneering solution. This undertaking represents a significant leap forward in addressing the safety concerns and operational efficiency of electric line personnel who operate in potentially perilous environments. Through an extensive literature survey, it becomes evident that while traditional circuit breakers serve a fundamental role in electrical safety, contemporary challenges necessitate innovative solutions. The amalgamation of password-based circuit breaker technology with the ubiquity and versatility of Android applications provides a promising avenue for enhancing the safety and control of electrical systems. The project's core objectives revolve around the development of a secure, accessible, and user-friendly system. Its emphasis on user authentication, remote control, and emergency management fills a void in existing research and industry practices. The Android application interface, paired with a password-based circuit breaker system, empowers electric line workers to exercise precision control over power distribution while maintaining a formidable layer of security. In conclusion, "Electric Line Man Safety Using Password-Based Circuit Breaker with Android App" manifests itself as a testament to the convergence of cutting-edge technology with occupational safety. By combining the robustness of password-based circuit breakers with the convenience of an Android application, this project presents a compelling vision for the future of electrical line work. It stands as a testament to the ongoing pursuit of innovative solutions to secure the well-being of those working with electrical systems while contributing to the efficiency and adaptability of the power distribution infrastructure.

REFERENCES:

1. "The 8051 Microcontroller and Embedded systems" by Muhammad Ali Maida and Janice Gillespie Mazidi, Pearson Education
2. ATME89S52 Data Sheets.
3. "Electrical Engineering Fundamentals" by VINCENT DEL TORO