PASSWORD BASED SECURITY SYSTEM FOR LINEMEN SAFETY

Smitha S Kamble, Chandanashree B J, Spandana B R, Poojitha C S

Department of EEE
GSSSIETW, Mysore, India.

Abstract- The "Password based security system for linemen safety" is an innovative approach to enhance the security and control of electrical circuits in various applications. The major problem in the power system is the electrical accident while repairing the electrical lines due to the lack of communication between the electrical substation and maintenance staff. The control to turn ON/OFF the line lies with the line man only. This system has an arrangement such that a password is required to operate the circuit breaker (ON/OFF). This system offers a reliable and efficient solution to mitigate potential hazards faced by line men during maintenance operations on live electrical circuits. By introducing an authentication mechanism, the system enhances safety measures and minimizes the possibility of accidental energization of the circuit, thereby safeguarding the line men and reducing the occurrence of electrical accidents.

Keyword- Arduino Uno, Electrical accident, Line men, 4 Channel Relay, Keypad, LCD.

I.INTRODUCTION
A security system with password is an important component of a comprehensive safety protocol designed to protect the lives and well-being of linemen working in the field. Linemen, who are responsible for maintaining and repairing electrical power lines, often encounter hazardous conditions and face significant risks during their work. The password-based security system serves as an added layer of protection to ensure that only authorized personnel can access critical equipment and perform potentially dangerous tasks.

The system is commonly used in various applications, including computer networks, industrial control systems, electrical distribution systems, and even residential applications. They provide an additional layer of security to prevent unauthorized individuals from tampering with critical circuits or equipment.

II.OBJECTIVES
1. The project is designed to connect and disconnect the energized line for repair or maintenance using a password.
2. This control system provides a solution, which can ensure the safety of linemen.
3. The system is fully controlled by Arduino uno.

III.SCOPE OF THE PROJECT
- Access Control: The primary purpose of a password-based circuit breaker is to control access to the circuit breaker or electrical system. It ensures that only authorized personnel can gain entry or make changes to the system.
- Security: The circuit breaker's password mechanism provides an additional layer of security, protecting against unauthorized access and potential malicious activities. By requiring a password, it helps prevent tampering accidental shutdowns, or other unauthorized changes that could disrupt the electrical supply or compromise the system's integrity.
- Reduction in line faults.
- Safety in maintenance.

IV.BLOCK DIAGRAM AND DESCRIPTION
Fig. 1 Block Diagram

Fig.1. A block diagram for a password-based security system for line men safety would consist of various components and their interconnections. Here's a description of the key elements typically included in such a system:

Keypad: It allows the linemen to enter the password to access the system.

LCD Display: It provides visual feedback to the line men, such as system status and instructions.

Arduino Uno: This central processing unit controls the overall operation of the security system. It receives input from the keypad and processes the entered password. It interacts with other components to activate or deactivate the safety mechanisms.

Authentication Module: This module verifies the entered password for authentication. It compares the entered password with the stored password(s) in its memory. If the password matches, it sends a signal to the Arduino for further

V. CIRCUIT DIAGRAM

Fig. 2 Circuit diagram of automatic street light using IR sensor and Arduino

VI.WORKING PRINCIPLE

Arduino Uno is used to control the operation of different components. A matrix keypad is connected to the Arduino Uno to enter the password. The entered password is compared with the stored password in the ROM of the Arduino Uno. If the given password is right, then only the relay can be switched off/on.

The proposed system provides a solution, which can ensure the safety of the electrical maintenance staff. The control to turn ON/OFF the line lies with the user only. The system has an arrangement with password is required to operate the transmission line (ON/OFF). Line men can turn off the supply and comfortably repair it, and return to the substation, then turn on the line by entering the correct password. When any password is entered the system checks and compare it with the stored password. If entered password is correct then the corresponding electrical line is turned ON
or OFF. If password is incorrect display shows wrong password. In this project a separate password is provided to each electrical line. Activation and deactivation of the line (circuit breaker) is indicated by the load.

VIII. RESULT
The proposed system provides a solution for ensuring the safety of maintenance personnel/linemen. The line man is the only one who repairs and operates the line on and off. This system is set up in such a way that a password is required to operate the circuit breaker (ON/OFF). The lineman can turn off the supply and comfortably repair it before returning to the substation and turning on the line by entering the correct password.

The system is fully controlled by an Arduino. A matrix keypad is interfaced to the Arduino to enter the password. The entered password is compared with the password stored in the ROM of the Arduino. If the password entered is correct, then only the line can be turned ON/OFF. Activation/deactivation of the circuit breaker are indicated by a lamp (ON/OFF). We can change the password after every time we use the system to increase the security level of system. A unique password can be set up so that the no other common person can fiddle with the system.

IX. CONCLUSION
The proposed system is a simple design and low budget economical system. For repairing the electric lines, the lineman and his safety plays a major role Technology is ruling the world now days, but it should not erase problems for our development. Human safety is the most important factor. We have achieved as per the objectives and requirement the aim of project that is to avoid the fault accidents for line men.

X. FUTURE SCOPE
Password-based security systems can leverage advanced analytics and machine learning algorithms to analyze data collected from various sources. By applying these techniques, the system can identify usage patterns, anticipate power demand, detect abnormal behavior, and provide recommendations for energy optimization. This can lead to improved efficiency and cost savings.

REFERENCES:
1. Electric Line Man Protection Using User Changeable Password Based Circuit
4. M. Kezunovic, “Improving Circuit Breaker Maintenance” task management through the use of mobile agent software IEEE.