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Electrical Line Operator Safety Utilizing with a Unique Fingerprint Scanner

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Abstract - *The repair of the current line tends to increase due to the lack of communication gap between maintenance personnel, line workers and substation personnel, causing electrical accidents for line workers. To prevent such accidents, circuit breakers are often designed so that only authorized persons can tamper with passwords or fingerprints. There are also rules for adjusting passwords. The framework is completely constrained by their group of 8-bit atmega microcontrollers. The secret word or unique finger impression is put away in the EEPROM and associated with the microcontroller. So the secret phrase is typically changed whenever, not at all like the tips that are composed constantly on the microcontroller. A relay used to open and close an illuminated circuit breaker with a keypad is used to enter the password when a finger is not detected. It also shows where certain line failures or warnings are occurring. The use of GSM electrical potentials creates a faulty line condition for repair and maintenance purposes***.**

***Key Words*: Arduino nano micro-controller, finger impression sensor, hand-off, keypad, electric lineman, GSM module etc.**

1. INTRODUCTION

Electricity has now become a part of our daily life. Electricity plays a major role in both domestic and commercial utility. Almost all devices at homes and industries are running because of electricity. As for how electricity is an important part of our life the electrician's life is also a predominant one.

The absence of communication during electrical wiring work with maintenance personnel is increasing the number of electrical accidents for wiring workers when repairing wires. The proposed system provides solutions to these problems to ensure the safety of power line installers.

This proposed paper tries to integrate the physical system through the digital world by using a cost-effective, easy to handle, and efficient technology such as fingerprint-based sensor applications to be adopted to create a safe and secure environment for the electrical lineman.

The fundamental goal of this project it will save the lives of wire workers. The major component of the proposed system is the finger impression scanner required to detect your finger. At the time of repair, the electrocution to the lineman may happen. If the lineman wants to repair the power system then the maintenance staff turns off the respective power line in the main station. The main station and the fault detected power lines may be in different areas. Due to these, the communication between the lineman and the maintenance staff may lack. Any other personnel in the main station or substation may mistakenly switch ON the power line without the knowledge of the lineman while working on the power lines. This would tend to fatal electrical accidents. The proposed framework provides a solution to ensure the safety of linemen.

Switches control of the transmission line. Manage lineman. The proposed framework not only focuses on the safety of the electrical wiring ball, but also provides a feasible system that can control the power lines.

1.1 LITERATURE SURVEY

In the existing system whenever any of the problems occur at distribution lines, lineman have to inform the substation operator to shut down the power of that specific line on which fault has occurred through making a phone call to the substation operator.

In[1],Oalekan oyebola ET. Al, it is recommend that the concept of human being life safety is supreme. In high-current switching systems, the switchgear protects the network. Still, the installation work of high voltage devices is essential to give the engineer confidence. To prevent accidental opening of the window by unauthorized persons, this article proposes a more secure-like switch password activation device to prevent unauthorized persons from selecting dangerous electrical appliances without prior notice from the field engineer.

Fig 1.1 Line maintenance.

In paper [2], the concept of cable maintenance this is due to miss communication and coordination between electrical line operator and substation staff. To foil such accident, circuit breakers frame work has been designed so that only authorized person can operate using a pass code. Code word changes are keeping pace. The pass code stored in the EEPROM is tied to the microcontroller. The secret word can be altered at any instance using the keyboard. This is different from a fixed password that is enduringly written to the microcontroller. A relay is represented by light used to operate a circuit breaker. (Enter the wrong password) If you try to open the switch incorrectly, another light will trigger an alarm.

The concept of the electric lineman the safety system utilizes a novel idea of onetime password OTP **In [3].** OTP plays an important role in this framework. A onetime password means that the generated password is dissimilar every time. These passwords give the system complete control for turning each line power on or off. Maintenance personnel, such as line workers, can control the opening / closing of the lines, because the line workers go to the substation to maintain the distribution line and communication between the line workers is likely to be interrupted. the power line and the operator or substation personnel. . This communication gap can endanger the lives of workers on wiring, transformers, or other components or appliances.

M. Hassan Ali, et. Al [4] concocted Develop and carries out the idea of the Global Mobile Communications System (GSM) in light of the electrical application control framework to accomplish absolute control of the interface where it is found. The GSM module is utilized to get the short message service (SMS) from the client's cell phone. The proposed system is synchronized with a microcontroller and a global system for mobile network interface that utilizes the Arduino programming. The framework is actuated when the client sends an instant message to the regulator in the home (which is viewed as a savvy home). Subsequent to getting the SMS guidance, the microcontroller unit consequently controls the electrical application as indicated by the client's directions through a proper switch activity.

In [5-7] Mallikarjun Hudedmani et.al the proposed system uses the GSM module to transmit the password to the line operator's mobile phone and continues to work. Passwords are entered via a matrix keyboard connected to the arduino nano microcontroller. The pass code entered by line man is compared with the pass code that the GSM receiver receives from the control panel. If the entered password is correct, the breaker opening and closing function will be activated. Allows line operators to perform maintenance.

2. PROPOSED METHODOLOGY

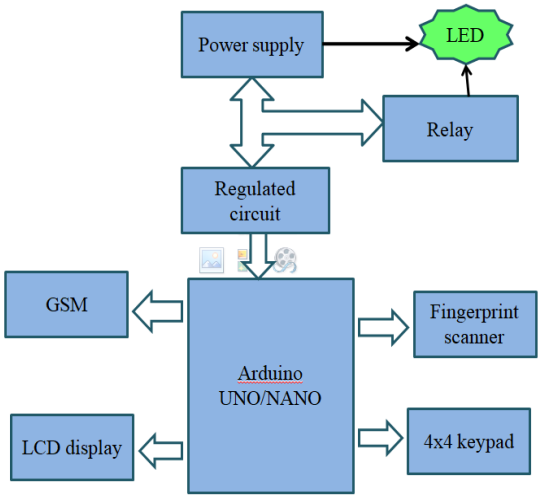


Fig.2 Block diagram of the proposed methodology.

The above shows a block diagram of an Arduino-based electronic circuit breaker configured with a finger impression scanner. A line-man puts a solicitation of turning off the power supply of the line which must be fixed or kept up with. The solicitation is conceded just if the unique finger impression matches with the ones put away in the record and the regulator conveys a message to the electrical switch for turning off supply. The line is turned off through a hand-off instrument.

The relay driver IC SONGLE SRD 5V relay can be used anywhere a low voltage circuit is used to turn the lights associated with the 220V power supply on and off with a switch that draws electricity.

The expected current of running the transmission curve is greater than the current that different on-board circuits (such as operational amplifiers, etc.) can provide. Transmission has extraordinary characteristics and is replaced by strong condition switches that are more robust than other state devices. The high current limit, the ability to withstand electrostatic discharge and the disconnection of

the control circuit are the distinguishing characteristics of the relay.

Arduino-nano is customized to give a sign to hand-off driver, LCD once a finger impression input has been perceived. LCD shows the situation with the framework. A pointer for yield is vital as it advises the client whether the line voltage is turned on or off. In our undertaking, this data is shown by interfacing a heap at the yield like a bulb.

If a validated client gives his/her subtleties then LCD show will demonstrate access granted It will display “POWER OFF". If an unauthenticated client gives his/her subtleties then LCD show will specify access not grunted: “POWER ON”.

3. OUTCOME AND RESULT

In this model, line workers must enter a certain password to perform maintenance / repair. If the password is wrong, you can use your finger to authentication after feeding the thumb on the fingerprint scanner. If the thumb is authenticated, the power line is off. After that, the line workers can complete the repair work, or maintenance, without worrying about electric shock.

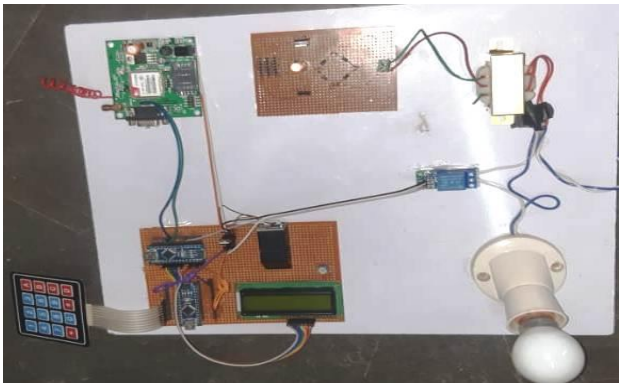
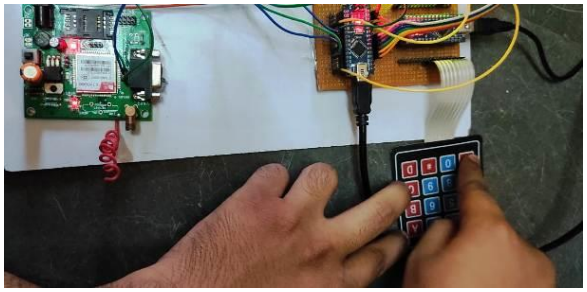


Fig 3.1 Implemented module of electric Line man /operator safety using keypad and finger print scanner module.

A snapshot of proposed system using the password. The password should be entered using keypad.



Figs 3.2 pass code entering using keypad.

If the password is invalid, the user must put their finger on the fingerprint sensor.

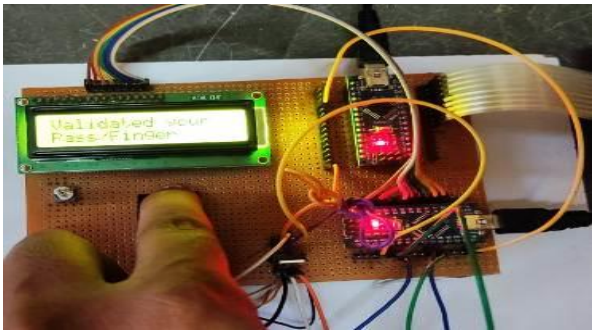


Fig 3.3 a snapshot of putting a finger on the fingerprint sensor to remove the power cords for maintenance.

After verifying the correct password or fingerprint, an SMS alert will be sent to the regional line operator and substation personnel, as show in below snap shot**.**

Fig 3.4 snap shot of SMS alert.

The line worker or maintenance personnel then repair the line for defects. After the reconfirmation is complete, the power cord that holds your finger over the fingerprint sensor lights up.

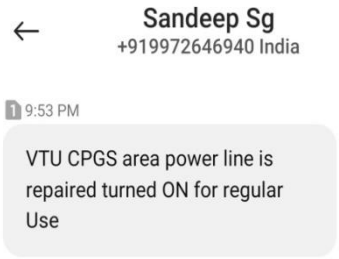


Fig 3.5 SMS alert power line has been repaired.

4. CONCLUSION

The lineman safety using a unique fingerprint scanner has been designed and tested successfully. I conclude that, it can work on a single given known password or finger . Provides a new method for line worker safety and eliminates line worker electrical accidents in line maintenance process.

Compared to other technologies, it is a secure method because uses a fingerprint scanner. It gives no scope of password stealing. It is effective in providing safety to the working staff. It can be easily installed.

5. FUTURE SCOPE

There is a scope of improvement of this project in terms of technology used like we can also use internet as platform to provide the status of usage of this mechanism. This can be implemented using RTC to shows real time power disconnect status. Provision of system front end

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