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Research Article

Gsm Adapted Electric Lineman Safety System With Protection Based Circuit Breaker

C.ARUNABALA[1], G.BRAHMATEJA[2], K.RAJU[3], K.GIDEON[4], B.VENKATESWAR REDDY[5]
[1]Professor, Department Of Electronics And Communication Engineering, KKR AND KSR Institute of Technology and Sciences, Guntur, Andhra Pradesh
[2,3,4,5]Student, Department Of Electronics And Communication Engineering, KKR AND KSR Institute of Technology and Sciences, Guntur, Andhra Pradesh
Email: Arunabala4700@gmail.com[1], Brahmateja464@gmail.com[2], raju.sunny1998@gmail.com [3], gideonkancherla@gmail.com[4],byreddy0202@gmail.com[5]
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ABSTRACT
This project focuses on the safety of the lineman while working, so they do not feel the sudden electric shocks. As the lineman has to deal with live wires very often, the probability of critical accidents are already very high. Therefore it was necessary to provide a safely system of protection to avoid the accidents that may occurs in case of miss coordination between the lineman and station or control staff. This project designed to give a high security system and that in switching off the meanly line with entering a password with a help of keypad. And here we have a safety system to work on it. When the lineman staff get finished what they work on, they can activate the line by either of two ways, entering the same password that added before using keypad on station, or by sending SMS message including the password that selected before, and here we have a very important feature that is gain time.

Keywords: Arduino, Password Detection, Matching, Circuit Breaker

Introduction

Security is the prime concern in our day to day life. Everyone needs to be secure as much as possible .The electric line man safety system is designed to control a circuit breaker by using a password for the safety of electric man. Critical electrical accidents to line men are on the rise during electric line repair due to lack of communication and co-ordination between the maintenance staff and electric substation staff. This proposed system provides a solution that ensures safety of maintenance staff, i.e., line man. The control to turn on or off the line will be maintained by the line man only because this system has an arrangement such that a password is required to operate the circuit breaker (on/off). The system is fully controlled by a microcontroller from AVR family. A matrix keypad is interfaced to the microcontroller to enter the password. The entered password is compared with the password generated. If the password entered is correct, only then the line can be turned ON/OFF. To repair a particular section of the electric supply line, the lineman wants to turn off the supply to that line. A request to the system. Then the system responds to him using the LCD display to enter the password. Then the system generates a password and it will be send to the phone (the no of which is stored in the program).The password based circuit breaker can also be implemented in automatic door locking system for providing high security. And also can be implemented to control electronic appliancesto save the power.

Objective

- The password based circuit is to ensure the security purpose.
- To block the unauthorized entries.

Methodology

Programs are written by using keil software and the program is loaded to the ARDUINO. And now connections as per the circuit diagram. And make sure that no common connection between AC and DC supplies. Apply the power supply to the circuit and LCD display then works then it asks to enter the password.

Implementation

For the Circuit Breaker,realization are response to the softwear must be kept in the right format.The project is implemented by an EEPROM for user to change the password for a more securing of a system.

Hardware Requirement

EEPROM

EEPROM (also written E2PROM and pronounced "e-e-prom", double-e prom", "esquared",Or simply "e-prom") stands for Electrically Erasable Programmable Read Only Memory and is a type of on- volatile

memory used in computers and other electronic devices to store small amounts of data that must be saved when power is removed, e.g., calibration tables or device configuration.
When larger amounts of static data are to be stored (such as in USB flash drives) a specific type of EEPROM such As flash memory is more economical than traditional EEPROM devices. EEPROMs are organized as arrays offloating gate transistors**.**

LCD Display
LCD from the name "Liquid Crystal" itself. It is actually a combination of two states of matter
– the solid and the liquid. They have both the properties of solids and liquids and maintain their respective states with respect to another

For ease of interaction with the user, this system uses an electronic display module. Here a 16x2 LCD is used. This means in 2 lines it is possible to display 16 characters per line. A 5x8 pixel matrix is used for display one character. Two registers are associated with an LCD, such as data and command. These modules arepreferred since it is easily programmable. For providing visual assistance to the lineman this is unavoidable.
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Fig.1 LCD display

ARDUINO
Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs – light on a sensor, a finger on a button, or a Twitter message – and turn it into an output – activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

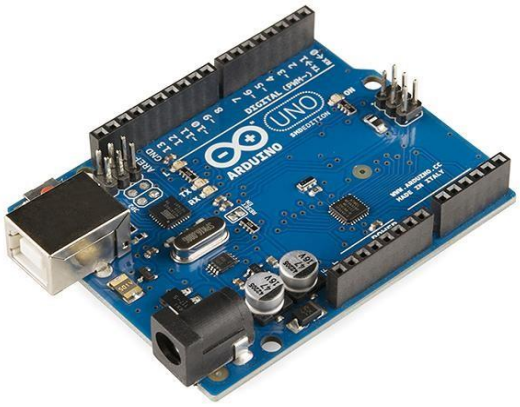

Fig.2: Arduino

Software Requirements
Keil compiler
Keil implemented the first C compiler designed from the ground-up specifically for the 8051 microcontroller. Keil the provides a broad range of development tools like ANSI C compiler, macro assemblers, debuggers and simulators, linkers, IDE, library managers, real-time operating systems and evaluation boards for Intel 8051, IntelMCS-251, ARM and XC16x[1]/ C16x[2]/ST10[3] families.

Languages Used
Embedded C Language:

An embedded system is an application that contains at least one programmable computer (typically in the form of a microcontroller and microprocessor or digital signal processor chip) and which is used by individuals who are, in the main, unaware that the system is computer- based.

Advantages

- Avoids electrical accidents to line man.
- Project is simple and easy.
- Uses commonly available components.

Disadvantage

Harder and more costly to obtain high short circuit interrupting capacities.

Results

This proposed system provides a solution, which can ensure the safety of the maintenance staff e.g. line man. 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). Line man can turn off the supply and comfortably repair it, and return to the substation, then turn on the line by entering the correct password. Since it has the provisionof changing the password, person can give any password of his will and have his work done safer.

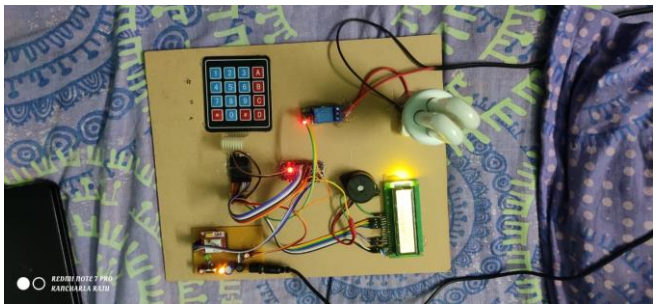

Fig.3: Module of the circuit

Applications

- Used in electrical substations to ensure line mansafety.
- This system is used in buildings and houses.
- Used in hotels and shopping malls to save thepower

Conclusion

Circuit breaker can work on a single given known password. The password to operate can be changed and system can be operated efficiently with the changed password. No other person can reclose the breaker once the changed password is given into system other than the person who had changed it. It gives no scope of password stealing. It is effective in providing safety to the working staff. It is economical and It can be easilyinstalled.

Future Scope

- Development in Electrical power transmission system requires the use of circuitbreakers with increasing breaking capacity.
- It can also be interfaced with a GSM modem for remotely controlling the electronic circuit breaker via SMS.

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