



Password Based Circuit Breaker

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Abstract: A circuit breaker is an automatically operated electrical switch designed to protect an electrical circuit from damage caused by overload or short circuit. Its basic function is to detect a fault condition and interrupt current flow. Unlike a fuse, which operates once and then must be replaced, a circuit breaker can be reset (either manually or automatically) to resume normal operation. When operated manually fatal electrical accidents are seen to the line man are increasing during the electric line repair due to the lack of communication and coordination between the maintenance staff and the electric substation staff. In order to avoid such accidents, the breaker can be so designed such that only authorized person can operate it with a password. Here, there is also a provision of changing the password.

I. 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 appliances to save the power.

II. OBJECTIVE:

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

III. 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.

IV. 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.

V. 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 of floating 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 are

preferred since it is easily programmable. For providing visual assistance to the lineman this is unavoidable.



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.

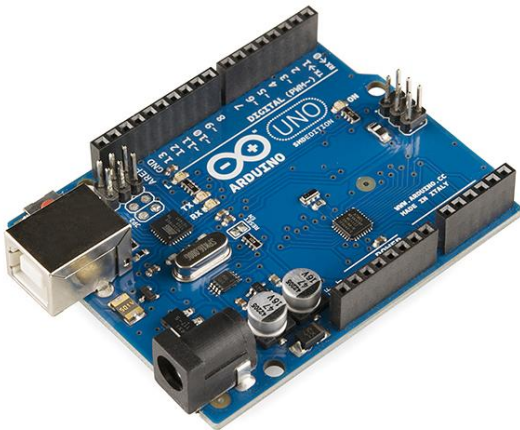


Fig.2 Arduino

VI. SOFTWARE REQUIREMENTS:

Keil compiler :

Keil implemented the first C compiler designed from the ground-up specifically for the 8051 microcontroller. Keil 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.

VII. ADVANTAGES:

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

VIII. DISADVANTAGE:

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

IX. 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 provision of changing the password, person can give any password of his will and have his work done safer.

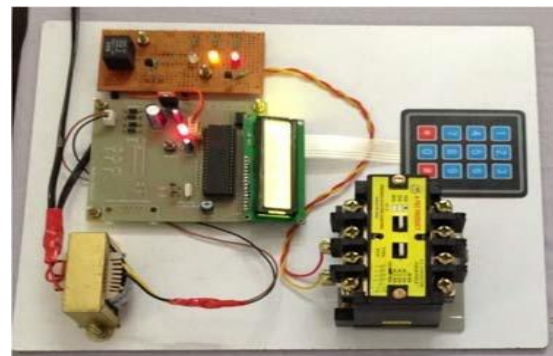


Fig 3. Module of the circuit

X. APPLICATIONS:

- Used in electrical substations to ensure line man safety.
- This system is used in buildings and houses.
- Used in hotels and shopping malls to save the power

XI. 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 easily installed.

XII. 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.

REFERENCES

- [1] Veena, "Electric line man safety system with OTP based circuit breaker", SR Engineering College, Volume:2, May 2015
- [2] Muhaad Ali Mazidi and Janice Gillisllispie Mazid, "The Microcontroller and embedded system", Person Education, 2nd edition, Issue:1999
- [3] Dr.Neelam Rup, Prakash, "International Journal of Engineering Trends and Technology", (IJETT), Volume 13, page:261, Issue:3 – Jul 2014.
- [4] Mark Halpin: "National Code Committee", Volume40, page:228, Issue:2002
- [5] Deepak Sharma & Major Sing Goraga: "International Journal Of Current Engineering And Scientific Research (IJCESR)" Volume-2, issue-May 2015
- [6] Athira P Nair: "electric line man safety system with otp based circuit breaker" BTC College of Engineering, Kerala, ,Volume :04, issue: April, 2015
- [7] VINCENTB DEL TORO: "Electrical Engineering Fundamentals", Issue:1-Jan 1986
- [8] John M.Osepchuk: "IEEE Engineering in Medicine and Biology Volume15(1), Page:116-120, Issue:June 1996.
- [9] David J. Marne, "National Electrical Safety Code" issue:1997
- [10] Mohammad Tasdighi: "Inductive FCL's impact on circuit breaker's interruption condition during short-line faults" North American Power Symposium (NAPS), Issue: 22-24 Sept2013
- [11] T.Matsumura, T. Uchii and Y. Yokomiz: "Development of Flux-Lock Type Fault Current Limiter with High-Tc Superconducting Element", IEEE Transactions on Applied Superconductivity, by "": Vol. 7, No. 2, Issue:June 1997

