PASSWORD BASED CIRCUIT BREAKER USING MICROCONTROLLER

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ABSTRACT

Security is the prime concern in our daily life while performing any activity. In the current scenario, the accidental death of the lineman is often read and evidenced. In this direction, a safety measure to safeguard the operator is found very necessary looking into the present working style. The electric lineman safety from this model is designed to control the control panel and circuit breaker by using a password for safety of these people. Critical electrical accidents to lineman are on the rise during electric line repair may be due to lack of communication and coordination between the maintenance staff and electric substation staff.

Keywords: 4*4 Keypad Matrix, 4-Channel Relay, IOT, Arduino Uno.

I. INTRODUCTION

The password-based circuit breaker is a breaker used to break circuits of big electrical lines. Which is fully controlled by the linemen/technician on the field because of which there will be no chance of accident of the lineman/technician. The development of password-based circuit breakers is mainly required by the electrician or technician to prepare themselves for accident injuries. The main aim of this project is to reduce the accidental case of death or injuries of the linemen is noticed while working on the section of line repair or maintenance. In the meantime, the circuit breaker provides them a password facility so that the users/linemen can do maintenance of the electrical lines by stopping the flow of electricity by using the password. We designed the project to facilitate the users/linemen to be able to work freely without any type of risk.

A circuit breaker is a system that is built basically for breaking the circuit of electrical lines. It is based on the Principle of Operation and The main component in the circuit is the 8051 microcontroller/ Arduino and is developed on Arduino uno. The circuit breaker is very popular nowadays among linemen and linemen are now using circuit breaker for their safety. It's very much important for a lineman to use a breaker to work freely. The system has an arrangement such that a password is required to operate the doors of the control panel and circuit breaker (ON/OFF). A secured password is requested and received from the control room by the lineman for the point of repair or service.

This paper presents the most steps within the development of a password-based electric circuit breaker for electricians using Arduino UNO. Arduino Uno may be a microcontroller board based supported by the UNO. It’s 14 digital input/output pins, 6 analog inputs, a 16 MHz ceramic resistor, a USB connection, a power supply, an ICSP header, and a reset button.

ADVANTAGES:

1) Avoids Electrical Accidents To Line Man.
2) It Improve The Line Man Safety.
3) Project Is Simple And Easy.
4) Uses Commonly Available Components.
5) Most Useful To Operate In The Public Areas.

Applications:
1) It Is Used In Electrical Substations To Ensure Line Man Safety.
2) Security Based Circuit Breaker Is Used In Buildings And Houses.
3) Used For Saving Power In Hotels And Shopping Malls.
4) It Can Also Be Used As Password-Based Load Control System Or Password Based Electrical Appliance Control.

II. LITERATURE SURVEY

An Electric circuit breaker is an automatically operated switch system designed to guard an electrical circuit against damage caused by overload or a short circuit on the transmitting lines. Its basic function is to find a fault condition and interrupts the current flow in between. Unlike a fuse, which operates once and so must get replaced, an electrical circuit breaker can be reset (either manually or automatically) to resume normal operation. When operated manually we see dangerous electrical accidents to the lineman are raising during the electrical line repair because of the dearth of communication and coordination between the maintenance/upkeep staff and also the electric substation staff. So as to avoid such accidents, the breaker will be so designed such only an authorized person can operate it with a password. A 4*4 keypad matrix is used to enter the password and a relay to open or close the circuit, which is indicated by a lamp. Any wrong try and to open the breaker (by entering the inaccurate password) an alert is going to be actuated, indicated by another LED. Its basic working is to find a fault and interrupt into the current flow. Unlike a fuse, which operates once so then must get replaced, a circuit is often reset (either manually or automatically) to resume normal operation.

III. MODELING AND ANALYSIS

List Of Hardware Components
Arduino Uno.
Resistor.
4-Channel Relay
4*4 Keypad Matrix
16*2 LCD Display.
20 pins to connect with LCD.
Jumper Wires. (30 male-female)
Loads
Transmitting Wires
Power cable/USB cable.
Potentiometer.
WIFI-Module ESP266
• Arduino UNO:-
The Arduino UNO is the best board to get started with electronics and coding. If this is your first experience tinkering with the platform, the UNO is the most robust board you can start playing with. The UNO is the most used and documented board of the whole Arduino family.
Liquid Crystal Display:-
An LCD (Liquid Crystal Display) screen is an electronic display module and has a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.

Wifi Module
The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all WiFi networking functions from another application processor.

Bread Board
A bread board may be a rectangular plastic board with a bunch of little holes in it. These holes allow you to simply insert electronic parts to example (meaning to make associated check associate early version of) an electronic circuit, like this one with battery, switch, resistor, associated an LED (light-emitting diode).

Connecting wires
Connecting wires permits associate degree electrical current to travel from one purpose on a circuit to a different as a result of electricity desires a medium through that it will move. Most of the connecting wires are created from copper.

IV. WORKING
This Project will be accustomed make sure that The Safety Of The Maintenance/ Upkeep Staff E.G. Line Man. The transmitting wires Can Be Only Turned Off/On By The Line Man. This Technique Provides a briefing specified a Password Is Required To control The Electrical Circuit Breaker (ON/OFF). Line Man Can put Off The
Provision And Comfortably Repair It, Then activate The transmitting wires By Entering The Correct Password. Since It’s The Provision Of fixing The Password, a Person Can Give Any Password Of His Will And Have His Work Done Safer.

**ALGORITHM**

1) Step 1.: Start.
2) Step 2: Initialize The System
3) Step 3: Read The Input Or Password From Keypad.
4) Step 4: If Password Is Correct Then Breaker Is ON/OFF.
5) Step 5: If The Password Is Wrong Then Go To Step No.3..
6) Step 6: Stop

**V. CONCLUSION**

Security/Safety Of The Project. It’s Designed To regulate A Circuit Breaker With The Assistance Of A Password. The Maintenance Staff E.G. Line Man's For Control To Turn ON/OFF. The transmitting wires Works With The Line Man Only This System Is Arrangement Such That A Password Is Required To run The Circuit Breaker (ON/OFF). Line Man Can Turn Off The Supply And Comfortably Repair It, And Return To The Substation, Then activate the transmitting wires By Entering The right Or Same Password. The System Fully Controlled By A Arduino. If The Password Entered through keypad Is Correct, Then The circuit will Be Turned (ON/OFF). Security Is Prime Concern In Our Daily Life. Everyone Wants To Be More Secure while handling electrical lines. This technique Provides a replacement Approach To A Lineman Security For Their Life. The Circuit Can Be Used Without any damage to A Lineman. The Circuit Can Be Used With numerous Load May Also Be Controlled When Required.

**ACKNOWLEDGEMENTS**

We take this opportunity to thank all the individuals connected with this project for their useful direction help and timely support which helped us to complete the project in specify amount of time. We would like to express great gratitude to our Head Of Department Mr.V.S.Solanke and our project guide Mrs.Trupti.Kherde for their all important support , motivation , guidance and helpful suggestion all over the project work. Lastly but not least our sincere credit goes to our family for their key support since we begin our education and also to our group person.

**VI. REFERENCES**