

Password Based Circuit Breaker

M Avinash¹, N Narendra Raju², K Dileep³, K Pavan⁴

^{1,2,3,4} B.Tech Students, Aditya Institute of Technology and Management, Tekkali Department of Electrical and Electronical Engineering

Abstract- The password based circuit breaker intended to give a solution to electrical accidents in the transmission lines which increasing due to the lack of proper communication between maintaince staff and the line man. The password based circuit breaker system provides a password to the each transmission line depending upon the requirements so that by entering the password we can turn on/off the transmission line. This password lie within the lineman and maintaince staff. The total system controlled 8 bit microcontroller belongs to 8051 family, a matrix keypad is used to enter the password and the relay driver used as control switch to switch on/off during over load and short circuit conditions.

INTRODUCTION

In recent times when fault occurs in transmission line then the lineman goes to the respected transmission line to repairing the transmission line at the time of repairing if unexpectedly any other switch on the transmission line it leads to fatal accidents to the line man. In this project we set password to the each transmission line .when a fault occurs in the transmission line then lineman enter the password of the respect fault transmission line so that power supply through the transmission line will stop and the line man goes for repairing the transmission line after repairing he comes to station he will type the password of the transmission line then the power supply in the transmission line Is turned. In this way this project helps to the lineman from many fatal accidents occuring in the transmission line due to lack of communication between the staff and the lineman here we using the 8051 micriocntroller for setting the password and used keypad for typing the password. In this system when password is correct then only the turn on/off the transmission takes place.

DESCRIPTION

RESISTOR

The resistor is a passive electrical component to create resistance in the flow of electric current. In almost all electrical networks and electronic circuits they can be found. The resistance is measured in ohms. Ohms law: $V=IR$ Resistors are used for many purposes. A few examples include delimit electric current, voltage division, heat generation and can be used to as electric brakes to dissipate kinetic energy from trains and resistors are used in power system to reduce the harmonics.

CAPACITOR

A capacitor is a passive electronic component which stores energy in the form of electric static discharge and it consisting of two parallel plates separated by an insulating medium called as dielectric. The capacitance is directly proportional to surface area of plates and inversely proportional to Separation between plates. Capacitance depends upon dielectric constant of the substance separating plates. The unit of capacitor is farads.

DIODES

A diode is a power semiconductor device with two terminals that conduct current in one direction only so diodes are used to convert ac to dc and these are used as half wave or full wave rectifier. It is used for many applications like conversion of AC to DC and output of system is known as bridge rectifier. The bridge rectifier provides full wave rectification.

TRANSISTORS

Transistor is a solid state device used for amplifying controlling and generating electrical signal. They are widely used in electronic equipment like radios and communication satellites. Transistor is a minute semi conducting device which performs most functions of

a thermionic valve but with greater efficiency and it can act as switch or amplifier.

VOLTAGE REGULATOR IC 7812

7812 is a voltage regulator integrated circuit. It is a member of 78xx series of fixed linear voltage regulator ICs. The voltage source in a circuit may have fluctuations and would not give the fixed voltage output. The voltage regulator IC maintains the output voltage at constant value. The xx in 78xx indicates the fixed output voltage it is designed to provide. 7812 provides +12V regulated power supply. Capacitors of suitable values can be connected at input and output pins depending output pins depending upon the respective voltage levels.

RECTIFIER

Rectifier is a power electronic component that converts alternating current (AC) to direct current (DC). A diode like one way current that flows in one direction, this process known as rectification.

MICROCONTROLLER

Microcontroller is a compact integrated circuit designed to govern a specific operation in an embed system. A typical microcontroller includes processor memory and I/O peripherals on a single chip and micro controller processor vary by application to application. In this project 8-bit micro controller with 16 k bytes are used.

RELAY

A relay is an electromagnetic switch. Its basic function is to allow a low power control voltage operate a high power switch. The control and the switch are electrically isolated from each other and they have their own voltage and current ratings/requirements.

Relays are first used as amplifiers and these are used to transmitted signal from one circuit and re-transmitted to other circuit. These are extensively used in telephone exchanges and before that used in computers as logic operations.

RELAY DRIVER

In a low power circuit, the output from a Microprocessor is very low. It is sufficient for a LED to glow but to drive a high load you will need a Relay (Electromagnet Switch), and to give proper voltage

or current to a relay you will need a relay driver. Many times one transistor with a resistance is enough to make a Relay Driver. In this type of circuit Transistor is use as current amplifier and Relay does two things one is isolate the flow of current and other one is act as electro magnet switch It is a type of mechanical Switch which is pulled by an electro-magnet.

MATRIX KEYPAD

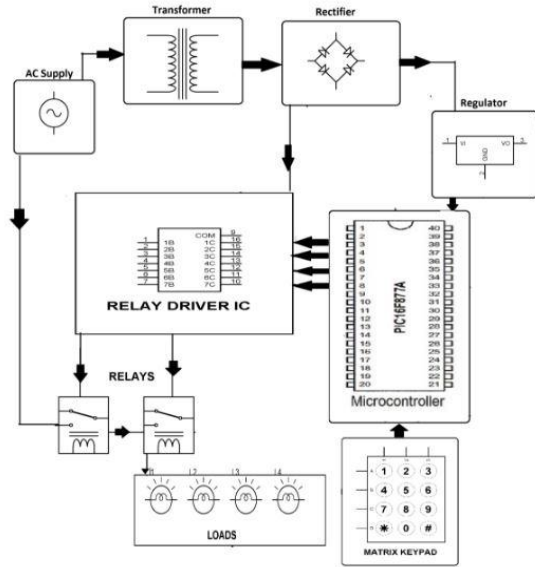
A keypad is the most widely used devices of digital circuits, microcontrollers or telephone circuits. Many applications require large number of keys connected to a computing system. Provided that it for the most part holds numbers then it can additionally be known as a numeric keypad

MATRIX INTERFACING KEYPAD

Pin 1.0 to pin 1.3 of port 1 of microcontroller are connected to rows of keypad and pin 1.4 to pin 1.6 of port 1 of 8051 micro controllers are connected to columns of keypad. When the numbers pressed in the matrix keypad load corresponding logical state at the input of the microcontroller i.e., port 1. The program is so written that when say 1111 is pressed then microcontroller delivers a logic high command at the controller output. This output high logic from the microcontroller is then fed to the relay driver IC input for ULN2003 output to go low to switch ON the corresponding relay that in turn switches on the load as per the password sent from the keypad. For example, if 1111 is pressed the corresponding load 1 is switched ON and while it is pressed again 1111 it switches OFF. Accordingly, all other loads are operated as per the passwords.

LCD DISPLAY

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.



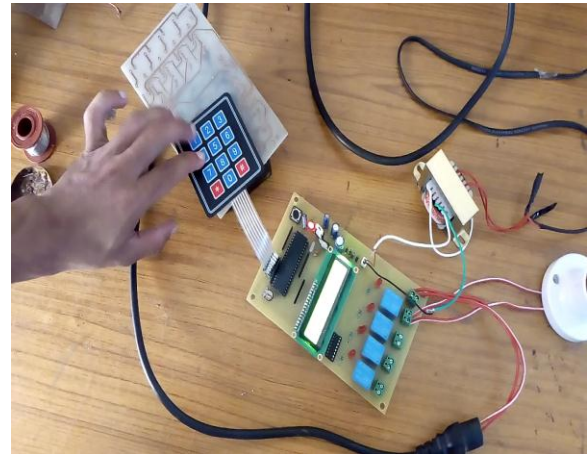
PRINCIPLE

In this circuit we are using 3x4 relay keypad for operating the system. The main component is 8051 microcontrollers. We can provide different password for different transmission lines in the circuit. The password is entered with keypad and it will check the predefined passwords of all transmission lines. If entered password is matching with transmission lines then switching on/off of the transmission line takes place. We can observe operation by the load output.

WORKING

In this system we provide standard 230V power supply to the step down transformer and transfer power supply to the load. A Step down transformer is placed to regulate the supply from 230V to 12V. After that a bridge rectifier is used to convert this 12V ac supply to 12V dc supply and this output is not regulated so voltage regulator used to convert the 12V dc supply in to 5V DC supply. It used led indication of power availability. To implement this program is written in embedded c and it was burnt in to microcontroller by using KEIL software. This microcontroller is interfaced with matrix keypad and LCD display and voltage regulator. The matrix keypad is connected to port1 and LCD display is connected to the port1 and LCD display is connected to port 0 and port2. when supply is switched on LCD shows enter the password we enter the password of

the required transmission lines by using relay keypad. If enter password is correct then the state of the output changes otherwise if enter password is wrong, then it shows wrong password.



RESULT

In this system safety purpose of the line man is achieved a password. The total transmission line can be controlled by using a password. To turn on/off of the load the lineman is required to enter the password. As password within the lineman it gives more security to lineman's life. It has an option of changing the password with the help of micro controller.

CONCLUSION

In this system it is operated only by using password. In this system we used microcontroller, relay drivers, LCD display, LED indicators and bulbs are act as load. This is easy method for solving life of the line man as it operation is very simple as it requires entering of the password for switching on/off the load. This process is better and accurate to safety purpose of the line man.

REFERENCES

[1] Imperial journal of interdisciplinary Research(IJIR) Vol-3, Issue-4,2017 ISSN:2454-1362,http://www.onlinejournal.in
 [2] International journal for Research in Applied Science and engineering technology(IJRASET) ISSN:2321-9653;IC Value :45.98;SJ Impact Factor:6.887 Volume 6 Issue IV, April 2018- Available at www.ijraset.com

- [3] “Electrical line man safety system with OTP based circuit breaker”, SR Engineering college, Volume: 2, May 2015
- [4] VINCENTB DEL TORO: “Electrical Engineering Fundamental”, Issue : 1-jan 1986
- [5] www.atmel.com
- [6] www.wikipedia.com
- [7] www.alldatasheets.com