

A PROJECT SUBMITTED
TO



HIRAPARA JENISH

Ms. Bhumika Nimavat

March, 2021

A
PROJECT REPORT ON THE MODEL OF
“PASSWORD BASED CIRCUIT USING
IC4017”

In Partial fulfillment for the award of the degree
Of
BACHELOR OF SCIENCE
IN
PHYSICS

Submitted by

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Under the Guidance of

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Rajkot

March-2021



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Certificate

Exam No.....

THIS IS TO CERTIFY THAT **HIRAPARA JENISH** A STUDENT OF **T.Y.B.Sc. PHYSICS** HAS SATISFACTORILY PREPARED INDIVIDUAL WORKING MODEL ON "**PASSWORD BASED CIRCUIT USING IC 4017**" AS PER THE SAURASHTRA UNIVERSITY SYLLABUS DURING THE Vth & VIth SEM OF THE ACADEMIC YEAR 2020 – 2021.

PROJECT INCHARGE

DATE:-

HEAD OF THE DEPARTMENT

SHREE H.N.SHUKLA COLLEGE OF SCIENCE

RAJKOT

Name & Signature of Examiner

DECLARATION

I here by declare that the working model entitled “**PASSWORD BASED CIRCUIT USING IC4017**” submitted to **Department Of Physics, Shree H.N.Shukla College Of Science – Rajkot** during the course of B.Sc.(Physics) semester Vth& VIth, is prepared by me to demonstrate the underlying principle of **PHYSICS**. This project has not been submitted to any other examination.

Place: Rajkot

Signature of the student

Date:

Name of the student

HIRAPARA JENISH

Acknowledgement

It is a great opportunity for a B.Sc. (Physics) student to prepare working model “**PASSWORD BASED CIRCUIT USING IC4017**” to know about the fundamental as the recent technological aspects of the physics.

First of all, I am very much thankful to Saurashtra University and Department of physics to include this kind of subject in B.Sc. Physics syllabus in which students can acquire more knowledge regarding the selected topic of preparing working model by doing necessary reference work.

I am very much thankful to **Ms. Bhumika R. Nimavat** for keen interest as well as giving me her valuable time and co-operation to develop this working model report by providing valuable guidance.

At last I want to thank all those who helped me directly or indirectly during my project progress report.

HIRAPARA JENISH



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Introduction

This is a simple password circuit that can run any electric device when a true password inserted the circuit based on IC counter 4017 that used in sequentially LED flasher and application.

For in this uses a four numeric code and this code number can be changed up to one thousand numbers.

When you press S1 then S2 then S3 then S4 the relay be turn ON otherwise the relay stay turn OFF. The keys that connected to pin 15 of the IC reset the circuit so if you pressed 2 first pass code correctly by pressing any false key the circuit reset the first correct codes. You have to configuration the S1 to S4 as you want for example if you want to make the password 7689 so you have to connect S1 to number 7 in the keypad and S2 number 6 and S3 to number 8 and S4 number 9 in the keyboard.

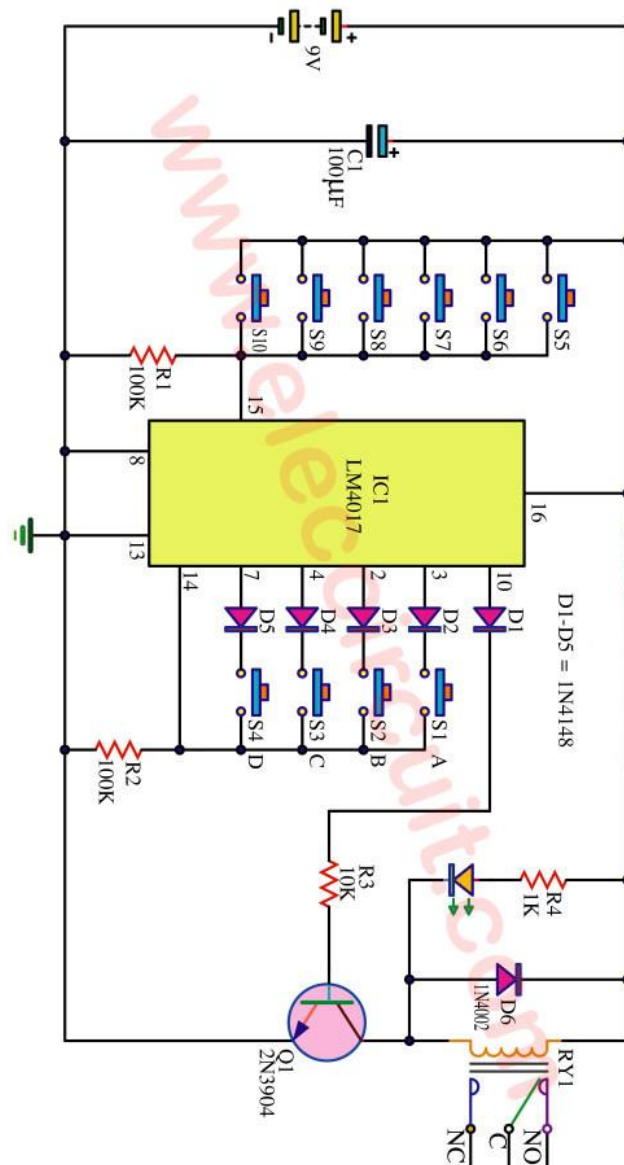
The circuit is designed to have the reset the system, immediately enter the wrong code. So can prevent pressing a random numeric code. Because in this circuit the switches are set to the ten numbers, be the code switching 4 pcs. And switches 6 pcs.



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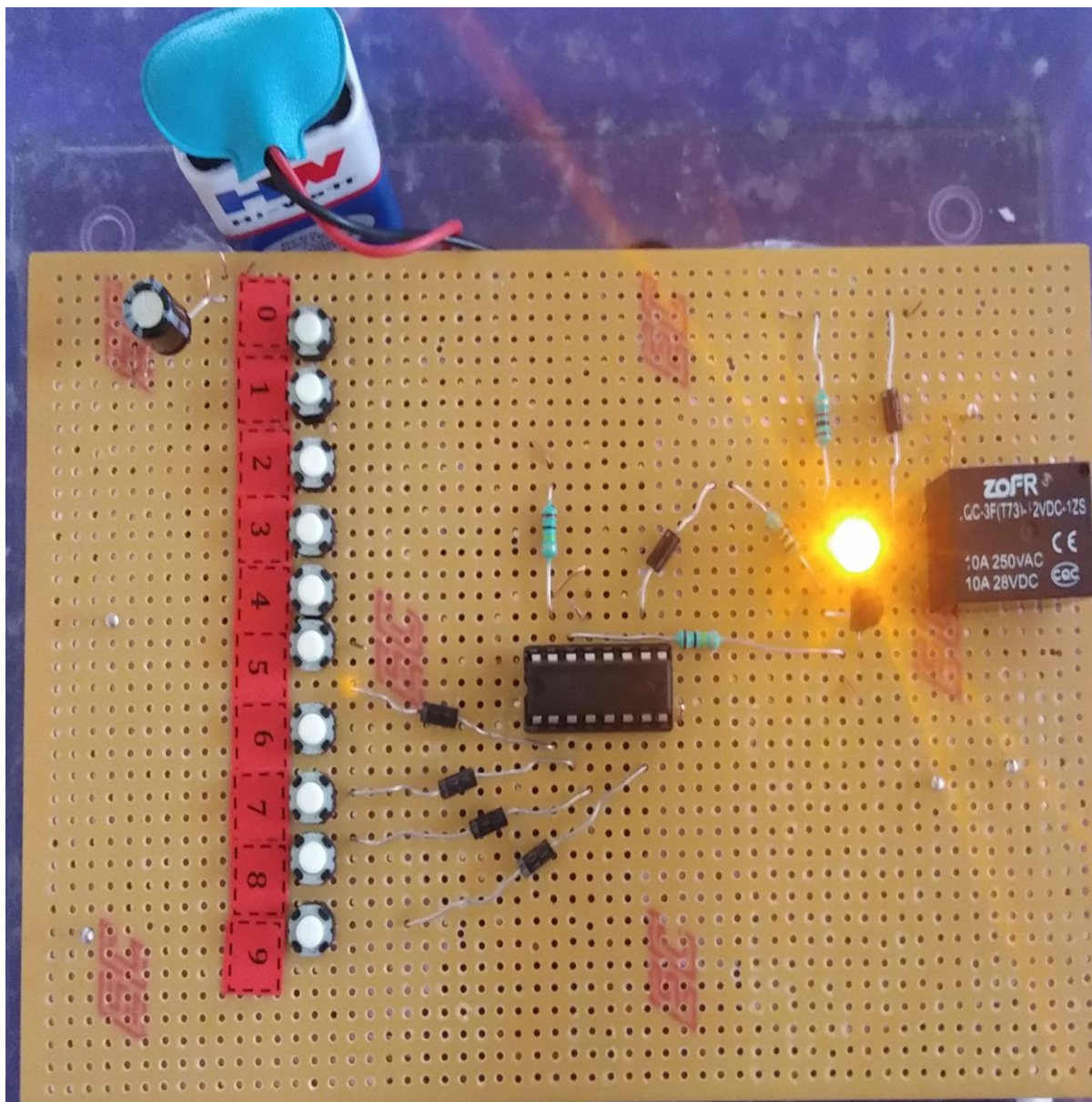


Block Diagram





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Component List

- ◆ IC 4017
- ◆ DIODE IR4007
- ◆ RELAY 12V
- ◆ CAPACITOR 100 μ f
- ◆ TRANSISTOR BC548
- ◆ MICRO SWITCH'S
- ◆ RESISTOR
 - 100k ohm
 - 10k ohm
 - 1k ohm



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Component Description

Capacitor:

A capacitor is a passive two-terminal electrical component that stores potential energy in an electric field. The effect of a capacitor is known as capacitance.

A capacitor can store electric energy when disconnected from its charging circuit, so it can be used like a temporary battery, or like other types of rechargeable energy storage system.

Capacitors are commonly used in electronic devices to maintain power supply while batteries are being changed. The unit of capacitance in the International system of Units (SI) is the farad (F), defined as one coulomb per volt (1 C/V).





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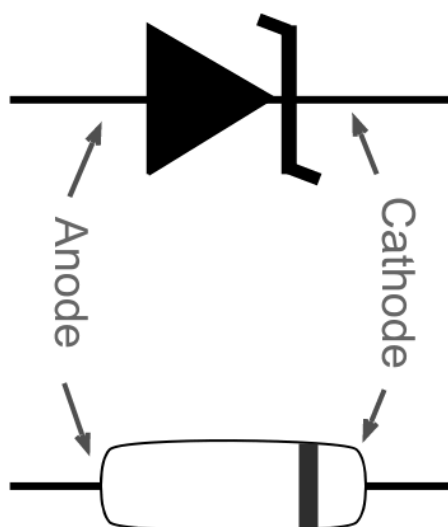
Zener Diode:

A Zener diode is a particular type of diode that unlike a normal one, allows current to flow not only from its anode to its cathode, but also in the reverse direction, when the Zener voltage is reached.

Zener diodes are widely used as voltage references and as shunt regulators to regulate the voltage across small circuits. When connected in parallel with a variable voltage source so that it is reverse biased,

A Zener diode conducts when the voltage reaches the diode's reverse breakdown voltage. From that point on, the relatively low impedance of the diode keeps the voltage across the diode at that value.

SYMBOL OF ZENER DIODE:





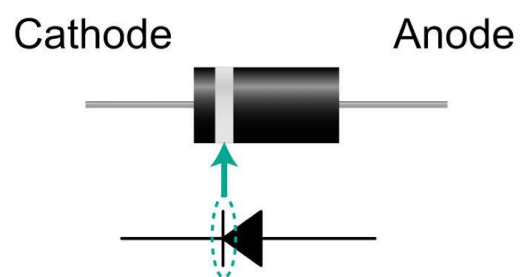
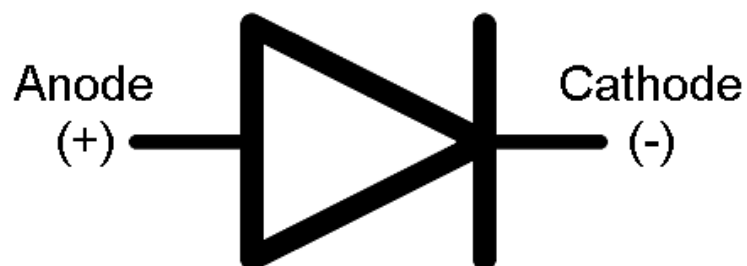
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Diode:

A diode is a two-terminal electronic component that conducts current primarily in one direction (asymmetric conductance) it has low (ideally zero) resistance in one direction and high (ideally infinite) resistance in the other.

Normal (p-n) diodes are usually made of doped silicon or rarely germanium.

SYMBOL OF DIODE:





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Relay:

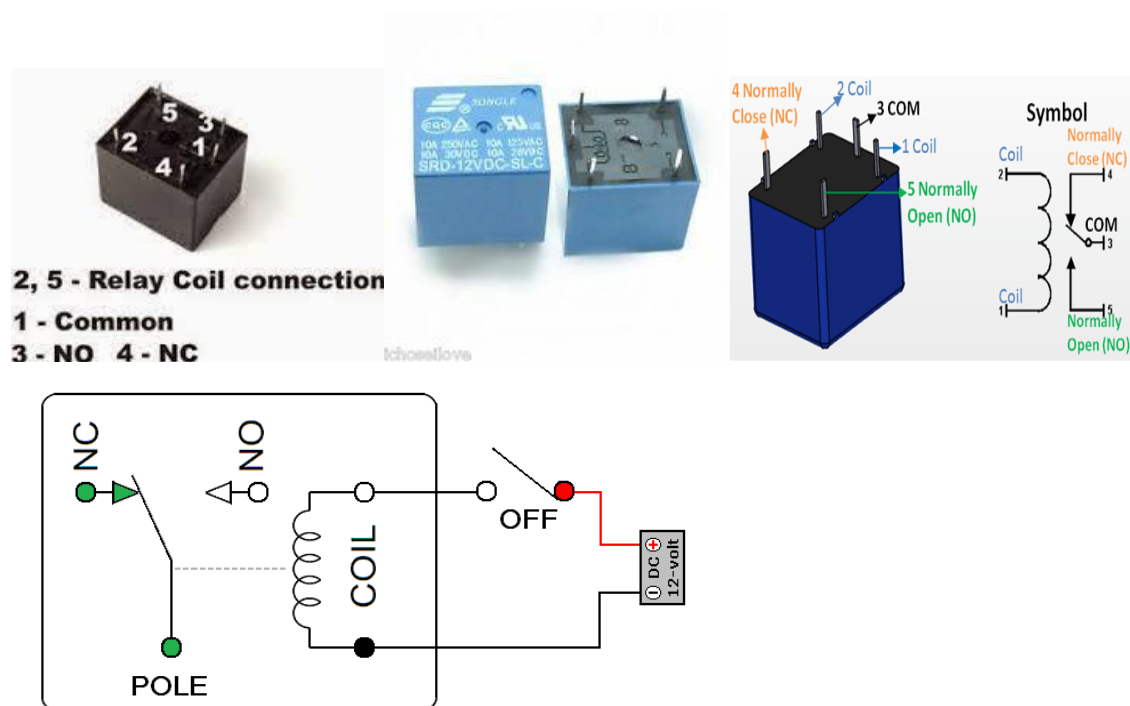
A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be ON or OFF SO RELAYS HAVE two switch positions and they are double throw (changeover) switches.

The relay's switch connections are usually labeled COM (POLE), NC and NO.

COM/POLE: common, NC and NO always connect to this, it is the moving part of the switch.

NC: normally closed, COM/POLE is connected to this when the relay coil is not magnetized.

NO: normally open, COM/POLE is connected to this when the relay coil is magnetized and vice versa.





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Resistor:

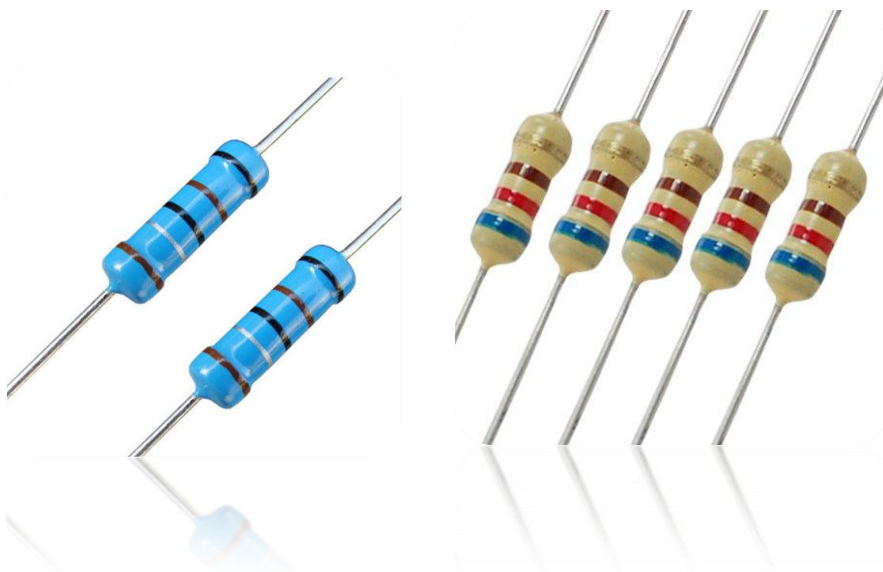
A resistor is a passive two terminal electrical component that implements electrical resistance as a circuit element.

In electronic circuits resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

Ohm's law:

Ohm's law states that the voltage (V) across a resistor is proportional to the current (I), where the constant of proportionality is the resistance (R).

Unit of resistor is Ω (ohm)





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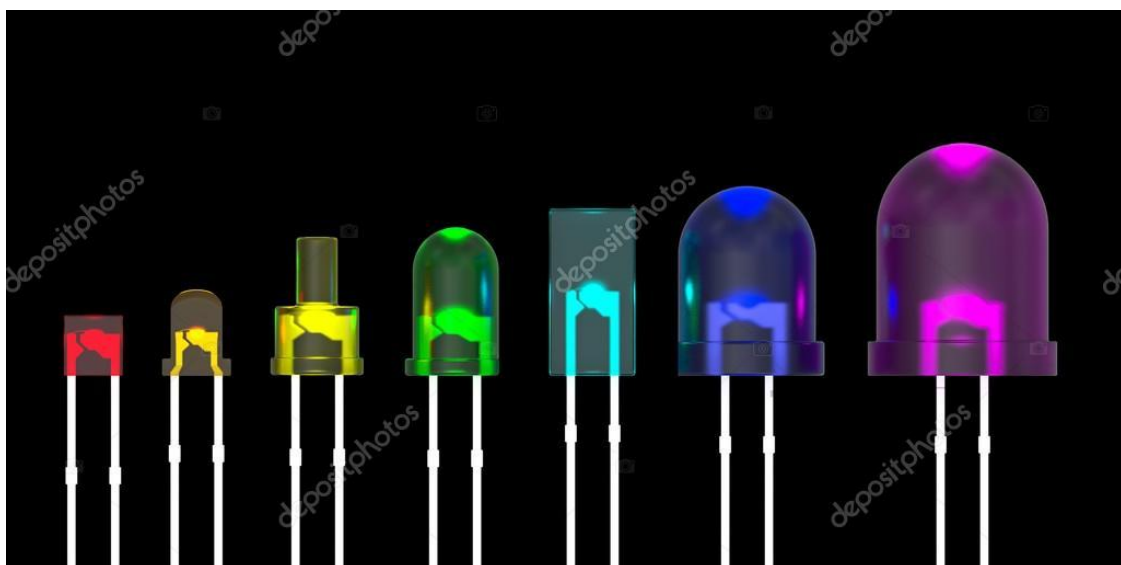
LEDs:

Light emitting diodes, commonly called LEDs are real unsung heroes in the electronic world. They do dozens of different jobs, and are found in all kind of device. Among other things, they form number on digital clocks, light up watches and tell you when device are ON.

Collected together they can form images on jumbo TV screens or illuminate a traffic light. Basically, LEDs are just tiny light bulbs that easily fit into an electrical circuit. But unlike ordinary incandescent bulbs, they don't have filament that will burn out, and they don't get especially hot.

They are illuminated solely by the movement of electrons in a semiconductor material, and they last just as long as a standard transistor.

The life span of an LED surpasses the short life of an incandescent bulb by thousands of hours. Tiny LEDs are already replacing the tubes that light up LCD, HD TVs, to make dramatically thinner televisions.





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IC 4017:

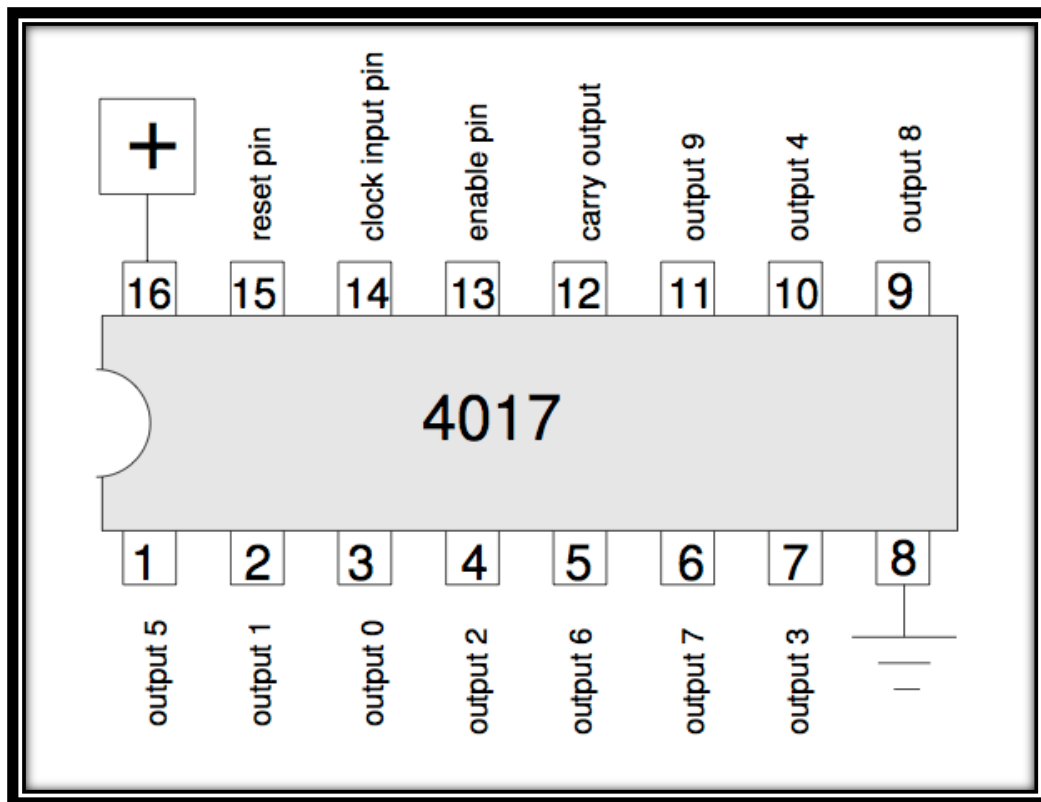


Fig 1

(Block diagram inside CD4017-IC)



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1. Here Pin 16 is positive power supply and 8 is a ground. The power supply range of 3 volts to 16 volts and maximum power supply voltage at pin 1 must not much than 18 volts.
2. Pin 13 is clock enabled pins to controls the clock.
3. Pin 14 is the clock triggers one count.
4. Pin 15 is the reset pin.
5. Pins 1-7 and 9-11 are the decoded output pins.



Working

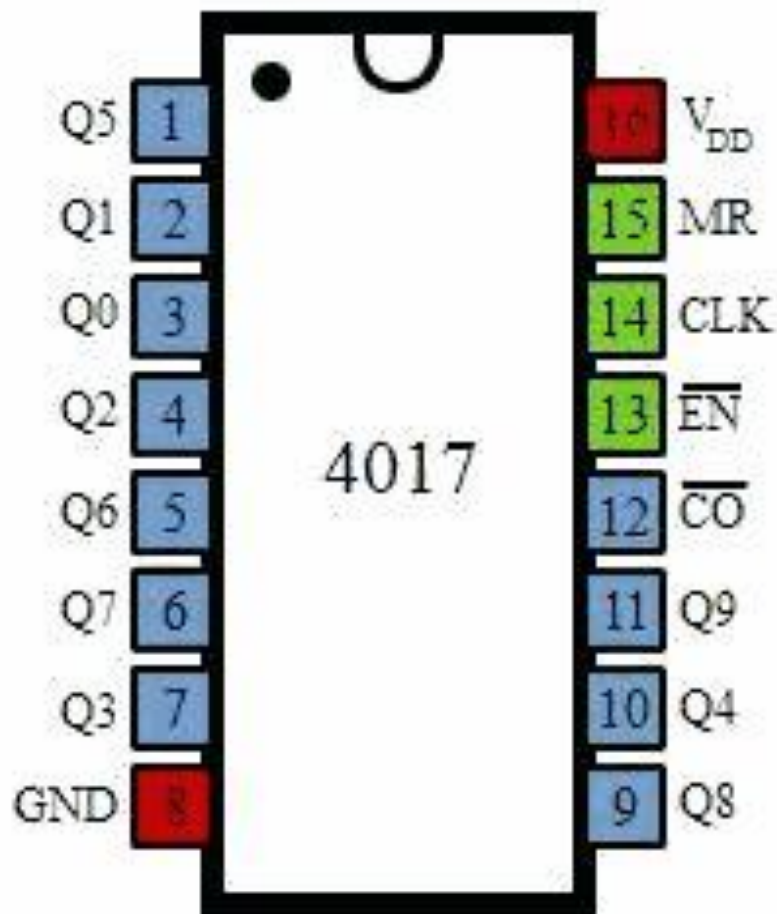


Fig 2

Here in this circuit we are going to use Q0, Q1, Q2, Q3, Q4 and MR Pins of pins for our code locker application. Switches S1, S2 to S7 will be used to feed the password input whereas close switch is meant to deactivate the locker after usage. As stated already that will successive clock pulses fed to the CLK pin the IC starts counting from 0 to 9 here



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the switches S5, S8, S3 and S1 is the correct password sequence for this locker. These switches are wired in such a way to provide successive clock pulses to the CLK pin of the IC.

When a user presses S5 first it feeds a clock pulse to 14th pin which makes the IC to increment the count. This in turn gives high output at Q1 (2nd pin). At this instant when S8 is pressed it feeds the next pulse to CLK pin and then the output goes high in Q2 (4th pin). Thus pressing the correct sequence S5, S8, S3, S1 will move the output from Q0, Q1, Q2, and Q3 and finally reaches Q4 where the transistor switch is connected. High in Q4 will activate the transistor which in turn the relay and locker ON.

Pressing switches other then the correct sequence that S2, S4, S6, and S7 will trigger a reset to CD4017. Also wrong sequence of S5, S8, S3 and S1 will not create any response from the circuit. A close switch which also triggers a reset was used to close the locker after usage an LED was added to indicate activation/deactivation of the locker.



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Application

Code lockers are used for security purposes and it is of many types based on their complexity and level of security they provide.

Here we are going to see building of simple code locker circuit using decade counter IC CD4017. It only requires minimum components and easy build. It is capable of providing good level of security for the users.



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Reference

- www.fairchildsemi.com
- <http://www.elprocus.com>
- <http://facebook.com/jhaelecronic>