



International Journal Of
**Recent Scientific
Research**

ISSN: 0976-3031
Volume: 7(6) June -2016

A STUDY ON DELAY OF TIME IN TRAFFIC LIGHT SIGNALS USING IC 555 TIMER, IC
4017

Madhavalatha E.S.S



THE OFFICIAL PUBLICATION OF
INTERNATIONAL JOURNAL OF RECENT SCIENTIFIC RESEARCH (IJRSR)
<http://www.recentscientific.com/> recentscientific@gmail.com



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

International Journal of Recent Scientific Research
Vol. 7, Issue, 6, pp. 11589-11591, June, 2016

**International Journal of
Recent Scientific
Research**

Research Article

A STUDY ON DELAY OF TIME IN TRAFFIC LIGHT SIGNALS USING IC 555 TIMER, IC 4017

Madhavilatha E.S.S

Electronics and Communication Engineering, Bhoj Reddy Engineering College for Women,
Hyderabad, Telangana, India

ARTICLE INFO

Article History:

Received 29th March, 2016

Received in revised form 19th April, 2016

Accepted 25th May, 2016

Published online 28th June, 2016

ABSTRACT

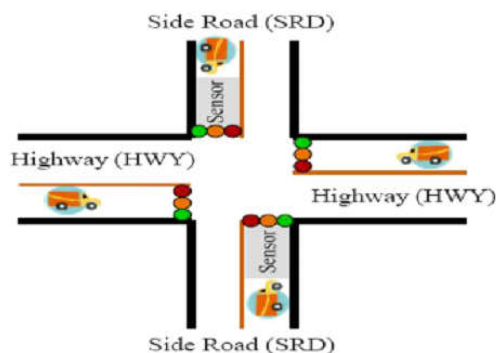
The fundamental idea of this paper is to study the delay in the time interval in traffic light signals. The traffic light is made up with the help of IC, which is used mainly for sequential circuits. We can also call it as sequential traffic lights. The working principle of the traffic light is the main IC 4017 which is used to glow the red, yellow, green LED respectively.

Copyright © Madhavilatha E.S.S., 2016, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Traffic light signals

Traffic Lights are used to control the vehicular traffic. In the modern era, everyone has different types of vehicles resulting in rise to the numbers of vehicles. That's why traffic lights are mandatory to avoid the traffic jams and accidents. There are three lights in the traffic signal, having different message for the drivers. Red light (upper one) asks the driver to yield at the intersection, green light (last one) gives the driver free license to drive through the intersection whereas the yellow light (middle one) alerts the driver to wait if the next light is red one or get ready to go / turn the engine ON if the green light is next. Traffic light has proved to be an amazing way to stop the vehicular collisions and control the traffic jams in today's modern era where everyone owns the different types of vehicles.



Basic idea of the paper

The basic idea behind this design is to avoid the collision of vehicles by providing appropriate signals to different directions

for a limited time slot, after which the next waiting drivers will be given the same treatment. In this way a cycle will be established which will control the traffic.

Technical approach

The main component used in this project is IC4017. It is a 16 pin DIP. The other components are resistors, capacitors, LED s, diodes, and battery of 9-12V.

The power supply range of 3 volts to 16 volts and Maximum power supply voltage at pin 1 must not much than 18 volts.

List of components

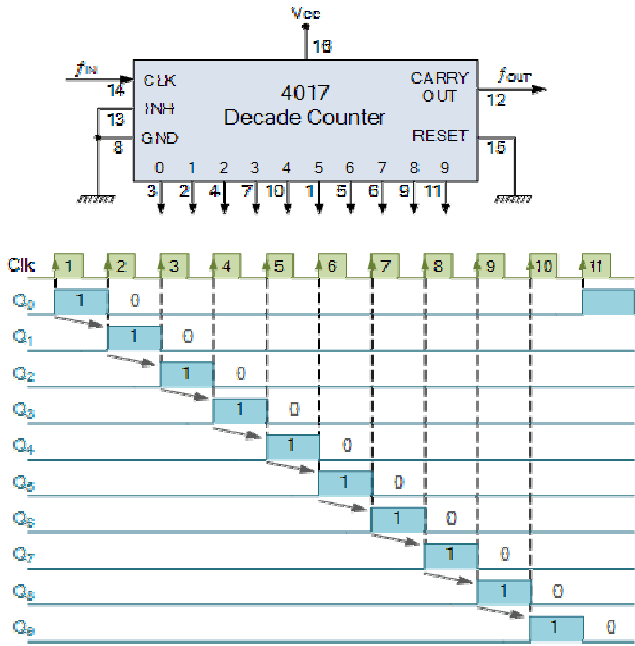
- IC 4017
- IC NE555
- DIODES IN4148
- RESISTORS-1K,10K,22K,100K
- CAPACITORS-47UF,0.01UF,6.8NF
- BATTERY 9V
- Timing diagram of 4017IC:

IC555 Timer

The 555 is a monolithic timing circuit that can produce accurate and highly stable time delays or oscillations. It is one of the most versatile linear integrated circuits. Signetics Corporation first introduced this device as the SE/NE 555 in early 1970. The 555 timer basically operates in one of the two modes either as Monostable (one-shot) multivibrator as a stable (free running) multivibrator. The device is available as an 8 pin metal can, an 8 pin mini DIP or a 14 pin DIP. The SE555 is designed for the operating temperature range from -55 to +125 degree Celsius while the NE555 operates over a temperature range of 0 to +70 degree Celsius.

*Corresponding author: **Madhavilatha E.S.S**

Electronics and Communication Engineering, Bhoj Reddy Engineering College for Women, Hyderabad, Telangana, India



Working Principle

This traffic light is made with the help of counter IC, which is mainly used for Sequential Circuits. We can also call it as Sequential Traffic Lights. Sequential Circuits are used to count the numbers in the series.

Coming to the working principle of Traffic Lights, the main IC is 4017 counter IC which is used to glow the Red, yellow and green LED respectively. 555 timer acts as a pulse generator providing an input to the 4017 counter IC. Timing of glow of certain lights totally depends upon the 555 timer's pulse, which we can control via the Potentiometer so if you want to change the time of glow, you can do so by varying the potentiometer, having the responsibility for the timing. LEDs are not connected directly with 4017 counter, as the lights won't be stable. We have used the combination of 1N4148 diodes and the LEDs in order to get the appropriate output. Main drawback of this circuit is that we can never have an exact timing with this, however we will have best estimated.

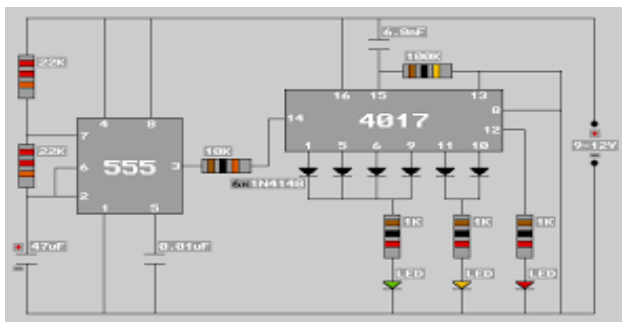


Table Sequence of lights (Truth table)

The delay of sequence of lights is

The ten stage decade counter have a memory of TEN. It can count up to ten pulses. So for every peak at clock, the counter admits it as an event and remembers it.

1. The time that the green light is on is 4 clock cycles
2. The time that the red light is on is 5 clock cycles and
3. The time that the yellow light is on is 1 cycle

Table Sequence of lights (Truth table)

sequence step	input A(Red)	input B(yellow)	Output (Green)
0	0	0	1
1	0	0	1
2	0	0	1
3	0	0	1
4	0	1	0
5	1	0	0
6	1	0	0
7	1	0	0
8	1	0	0
9	1	1	0

There are 3 types of leds

- RED light – instructs the driver to STOP at the intersection.
- YELLOW light – instructs the driver to WAIT (If red light is next) or GET READY (if green light is next)
- GREEN light – instructs the driver to GO through the intersection.

Output of traffic signals using 555 timer and 4017IC

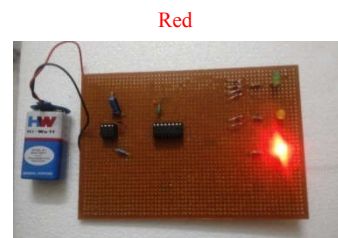


Fig 1 Output of red LED light

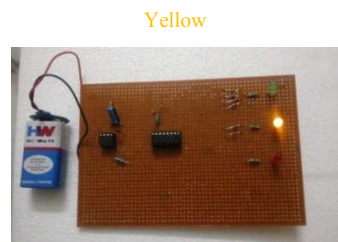


Fig 2 Output of yellow LED light
Green

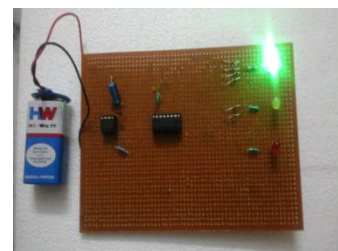


Fig 3 Output of Green LED light

By using this circuit we have generated three signals. They are red, yellow, and green

Scope of the Study

This system can be used in Ramp metering. We can use the circuit in timers. We can use in the fire station or medical emergency entrance and it can also be used at the landing-stage of a ferry and aboard the ferry.

In future scope, we can use this as remote traffic controller and can increase the efficiency by using microprocessors.

References

1. www.electricaltechnology.org
2. Textbook of Advanced Microprocessors by A.K.RAY, K.M.BHURCHANDI

How to cite this article:

Madhavalatha E.S.S.2016, A Study on Delay of Time in Traffic Light Signals Using Ic 555 Timer, Ic 4017. *Int J Recent Sci Res.* 7(6), pp. 11589-11591.

T.SSN 0976-3031



9 770976 303009 >