**MICROCONTROLLERS SOFTWARE PROJECT REPORT ON:**

**FOUR WAY TRAFFIC LIGHT SYSTEM USING**

**8051 MICRONTROLLER**

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**FOUR WAY TRAFFIC LIGHT SYSTEM USING**

**8051 MICRONTROLLER**

**1,INTRODUCTION:**

Traffic lights, also known as traffic lamps, traffic signals, stoplight, stop-and-go lights semaphore or robots, are signalling devices positioned at pedestrian crossings, road intersections, and other locations to control competing flows of traffic. Traffic lights have installed in most cities around the world to control the flow of traffic. It assigns the right of way to road users by the use of lights in standard colours (Red - Yellow - Green), using a universal colour code (and a precise sequence, for colour blind). Traffic lights are used at busy intersections to more evenly apportion delay to the various users. The increasing amount of traffic in the cities has a large impact on the congestion and the time it takes to reach a certain destination.

**1.1.OBJECTIVE:**

* The main objective of this traffic light controller is to provide sophisticated control and coordination to confirm that traffic moves as smoothly and safely as possible
* This project makes use of LED lights for indication purpose and a microcontroller is used for auto changing of signal at specified range of time interval. LED lights gets automatically turns on and off by making corresponding port pin of the microcontroller “HIGH”.

**1.2.PROPOSED ARCHITECTURE:**

**BLOCK DIAGRAM**

**TRAFFIC SIGNAL 1**

**8051**

**MICRO-**

**CONTROLLER**

**TRAFFIC SIGNAL 2**

**+5V POWER SUPPLY**

**TRAFFIC SIGNAL 3**

**TRAFFIC SIGNAL 4**

**WORKING:**

In this Four way traffic light system 4 LED’s (Traffic signals) are used for the purpose of traffic light control. An 8051 Microcontroller is the brain of this whole project and is used to initiate the traffic signal at the intersections on road. The 8051 microcontroller makes use of a crystal oscillator for generating frequency clock pulses. The LEDs are interfaced to the Port two and Port Three of the microcontroller and are powered with 5v power supply. The 8051 microcontroller is programmed in such a way that the respective LED’s glow by setting the required bit using Assembly language and a certain amount of delay is provided.

**1.3.SOFTWARE TOOLS USED:**

1. **Keil software:**

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 (currently RTX5) and evaluation boards for over 8,500 devices.

# Proteus software:

# The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation.

# 1.4.DESCRIPTION OF COMPONENTS:

* **8051 MICRONTROLLER:** The 8051 is an 8-bit microcontroller with 8bit data bus and 16-bit address bus. The 16bit address bus can address a 64K (216) byte code memory space and a separate 64K byte of data memory space. The 8051 has 4K on-chip read only code memory and 128 bytes of internal RAM.
* **CRYSTAL OSCILLATOR:** These oscillator circuit makes use of the mechanical resonance of a piezoelectric material, most commonly a quartz crystal,  to create an electrical signal with a precise, stable frequency. The signal thus created is usually referred to as a clock signal and is used to synchronize the operation of the 8051 Microcontroller. The typical operating range of the crystal oscillators is from 40 KHz to 100 MHz.
* **DISPLAY UNIT:** It consists of 3 LEDs: Green, Red and Orange on each side of the junction– a total of 12 LEDs of three colors are placed at the junction.These LED lights are more efficient and consumes less energy.

**2. IMPLEMENTATION AND RESULTS:**

**2.1.ALGORITHM:**

1. Configure the Traffic light LEDs and crystal oscillator control lines.
2. Then initialize the ports of 8051 microntroller to zero.
3. Initially all the Traffic lights will be low.
4. Then the port pins are triggered accordingly to the sequence.
5. And the output is shown in Traffic light LEDs.
6. End.

# 2.2.IMPLEMENTED PROJECT:

# WhatsApp Image 2021-08-18 at 9.53.36 PM.jpeg

* The Above circuit illustrates the traffic flow layout of the four way road.
* The traffic flow can be classified in to four phases in the above circuit and I have considered the North as starting point of this traffic flow.
* In the above scheme,vehicles are allowed to make a free Left turn,so when the green signal is high,the vehicles can move in only two directions.i.e.straight and right.

**3.CONCLUSION:**

Designing of a system to control automatically the traffic lights on a four-way signal was the

main concern.Four way Traffic light control system using 8051 Microcontroller designed to

reduce Severe traffic Problems. Based on my analysis of the present traffic control system, the

following assumptions became necessary in order to develop a feasible system: Traffic only

moves from the North to South and vice versa at the same time and at this time the traffic from

the east and west is stopped. The use of Interfacing traffic lights to a 8051 microcontroller has

proved to be very beneficial in present Traffic Light Control System and that will minimize

waiting time of vehicle.

**4.LIST OF REFERENCES:**

[1]URL: <https://youtu.be/DjuURyd5Tao>

**5.APPENDIX:**

ORG 00H

MOV P2,#00H

MOV P3,#00H

MAIN:

SETB P2.2

SETB P3.2

SETB P2.3

SETB P3.3

ACALL DELAY1

SETB P2.4

SETB P3.4

CLR P2.3

CLR P3.3

ACALL DELAY2

MOV P2,#00H

MOV P3,#00H

SETB P2.5

SETB P3.5

SETB P2.0

SETB P3.0

ACALL DELAY1

SETB P2.1

SETB P3.1

CLR P2.0

CLR P3.0

ACALL DELAY2

MOV P2,#00H

MOV P3,#00H

SJMP MAIN

DELAY1: MOV R0,#200D

H1: MOV R1,#200D

H2: MOV R2,#71D

H3: DJNZ R2,H3

DJNZ R1,H2

DJNZ R0,H1

RET

DELAY2: MOV R0,#200D

H4: MOV R1,#200D

H5: MOV R2,#51D

H6: DJNZ R2,H6

DJNZ R1, H5

DJNZ R0, H4

RET

END