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Design and Development of Automatic Traffic Light control system

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Abstract: In this paper, Traffic Light Controller using Arduino is designed and experimentally tested. The proposed Arduino Traffic Light Controller Project is simple and can be easily understood. Here we have demonstrated Traffic lights for the 3 ways road and the code glows LED's on all the three sides in a particular sequence, in which the actual Traffic Lights works.

Keywords: Traffic Light Controller; Arduino; Traffic Signals; LEDs

I. INTRODUCTION

The use of personal vehicles is very common now a days and a result, the number of vehicles on the roads are exponentially increasing. Roads without any supervision or guidance can lead in to traffic congestions and accidents. Traffic Lights or Traffic Signals are signalling devices that are used to control the flow of traffic. Generally, they are positioned at junctions, intersections, 'X' roads, pedestrian crossings etc. and alternate the priority of who has to wait and who has to go[1-5]. The traffic lights will provide instructions to the users (drivers and pedestrians) by displaying lights of standard color. The three colors used in traffic lights are Red, Yellow and Green. The system must be used to control the traffic lights for smooth and safe movement of traffic. These control systems consists of electro mechanical controllers with clockwork mechanisms or modern solid state computerised systems with easy setup and maintenance [6-10].

II. PROPOSED ARCHITECTURE

The proposed Arduino Traffic Light Controller Project is simple and can be easily understood. Here we have demonstrated Traffic lights for the 3 ways road and the code glows LED's on all the three sides in a particular sequence, in which the actual Traffic Lights works. Like, at a time, there will be two Red signals on any of the two sides and one Green light on the remaining side. And yellow light will also glow, for 1 second each time, in between transition from Red to Green, means first red light glows for 5 second then yellow light glows for 1 second and then finally green light will be turned on.

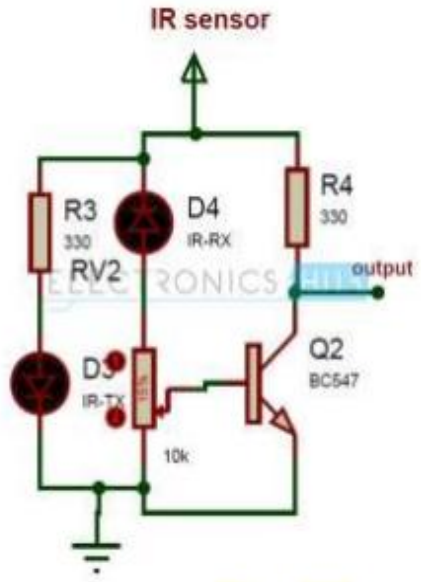

Fig 1: .IR sensor equivalent circuit

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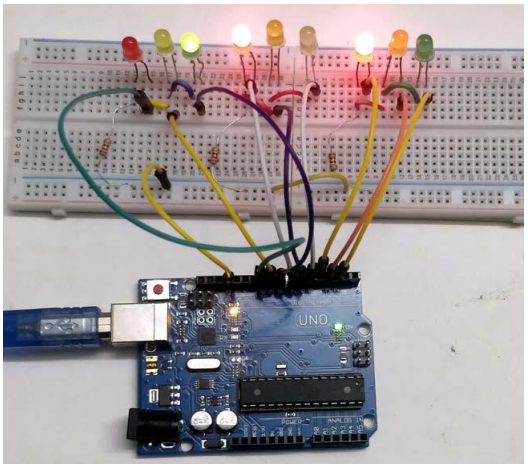

Fig 2: I- Traffic Light Controller using Arduino

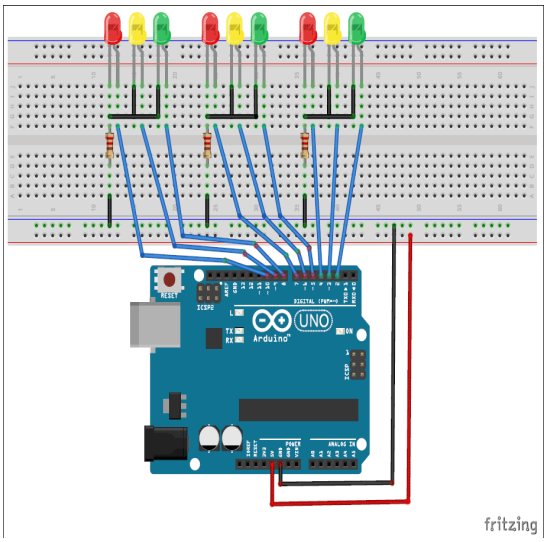

Fig 3: II-Traffic Light Controller using Arduino

Table :- Specifications of Arduino Used

Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 Ma
DC Current for 3.3V Pin	50mA
Flash Memory	32 KB of which 0.5KB
SRAM	2 KB
EEPROM	1 KB
Clock Speed	16 MHz
Length	68.6 mm
Weight	25g

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III. CONCLUSION

In this paper, Traffic Light Controller using Arduino is designed and tested. The proposed Arduino Traffic Light Controller Project is simple and can be easily understood. Traffic lights for the 3 ways road and the code glows LED's on all the three sides in a particular sequence, in which the actual Traffic Lights works is demonstrated. It is simple, easy to use and application in dense areas.

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