



Pre-Programmed Road Block Using Arduino Mega 2560

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ABSTRACT

In this project we are building an automatic road block using the Arduino Mega 2560. We are using an automatic road block to control the speed of the car. If the signal is red, then the speed breaker goes off the road automatically. After the signal turns green the speed bump automatically shuts off. In the fast-paced world, there are two perspectives, one that controls speed and the other that maintains a safety net. So speed control is very easy for a person and in a safe situation, there should be a lot of attention. For the purpose of safety, as well as to prevent accidents on the road, we can use a different method of using a speed breaker in concrete on the road. The main objective of this project is to control the speed of vehicles, to reduce the risk of near urban areas and restricted areas such as school grounds, parks, hospital areas and short turns, to provide first aid / full access to emergency vehicles such as ambulances, police van, etc. It even creates traffic flow and avoids traffic congestion. It also enables the public to cross the road without the risk of speeding traffic. It can be conveniently installed at airports and in factories wherever pedestrians and cyclists share space with high-speed vehicles.

KEYWORDS: Traffic, Roadblock, Traffic Signal, DC Motor, Road Safety

INTRODUCTION

Accidents are a major problem for the community as they can lead to the loss of lives, infrastructure and pose a risk to road safety. These are unexpected or unplanned events that occur in a variety of forms of transportation including air, land, sea and rail. Your main reason is negligence, driver fatigue, uneven road conditions etc. these factors cannot be completely avoided but can be minimized. Currently the vehicles are fully equipped with active and passive safety systems such as auto braking, adaptive cruise control, traction control systems, ABS, collision avoidance systems etc. These systems provide security at that level not only but because of its own shortcomings or the need for specific operating conditions to operate effectively. Measures taken by traffic authorities around the world to reduce reckless driving and to improve public safety and reduce accidents significantly. But no matter what happens, the accidents still occur and cause great losses to infrastructure as well as to human life. A major problem related to these accidents is the establishment of emergency services and the immediate rescue of injured passengers.

In places as remote as the highway, there are no facilities for improved road safety systems or hospitals. In the event of a car accident, injured passengers are not in a position to receive emergency medical attention. Therefore, these unarmed passengers are not in a position to request transportation and medical care. It also creates roadblocks as accidents do not deviate quickly and lead to traffic congestion.

To address this problem, a new road safety concept was developed and developed that will transform the rescue mission during accidents and avoid further roadblocks. In this project we are building an automatic Road block using the Arduino Mega 2560. The Arduino Mega 2560 is a microcontroller board based on ATmega2560. It has 54 digital input / output pins (15 of which can be used as PWM output), 16 analog input, 4 UART (hardware serial ports), 16 MHz crystal oscillator, USB connection, power jack, ICSP header, and reset button. And to add extra functionality to it we use the IC L239D which is specially used as a DC Motor driver with this IC we can adjust the Motor speed and rotation as well.

EXISTING SYSTEM

We have referred our base paper ‘SMART SELF AUTOMATED SPEED BREAKER SYSTEM TO CONTROL VEHICLE SPEED USING IOT’ as our Existing System So in that system the automatic road block is installed in front of school zone and will be only activated during school hour For,e.g. if school timing is from 8:00 to 17:00 so speed breaker will be only visible for that time period After that it will be flat road surface through which vehicle can pass easily. For rotation of roadblock they have used Servo Motor which generates the low power as compared to DC motor and also servo motor becomes unpredictable when something breaks so it is not feasible to use for speed breaker rotation. So as its usage is very restricted. And it is not connected with traffic signals so it is not ensuring every vehicle on road is following the traffic rules this result in road accidents which are causing during crossing of roads.

PROPOSED SYSTEM

First, when we turn on the supply, the system starts a green signal, Arduino does not provide any input to the DC motor. The system is then operational and at this point the set block will match the high level of the road. Then start the yellow signal. When yellow the DC motor will start rotating straight to the clock as it rotates. If the given command goes from green to yellow, the road block then goes up at a lower speed. Lastly if the signal is red, and the block raised a certain distance from the road the DC engine will stop for about 45 seconds. And it will also rotate in the opposite direction of the clock. And after the red signal, Arduino will launch into the green, yellow, red loop cycle continues. As we said earlier our system will work continuously.

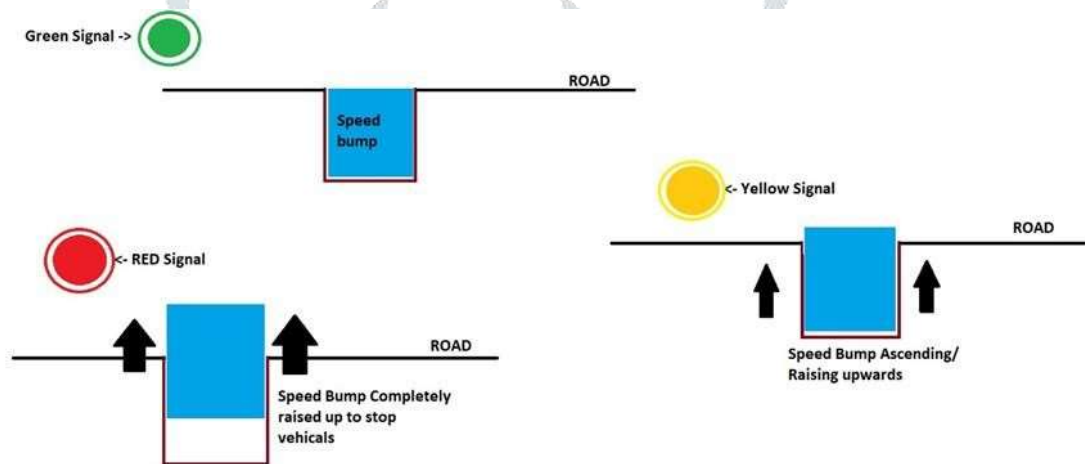


Figure 1: Pictorial Representation of the Road Block

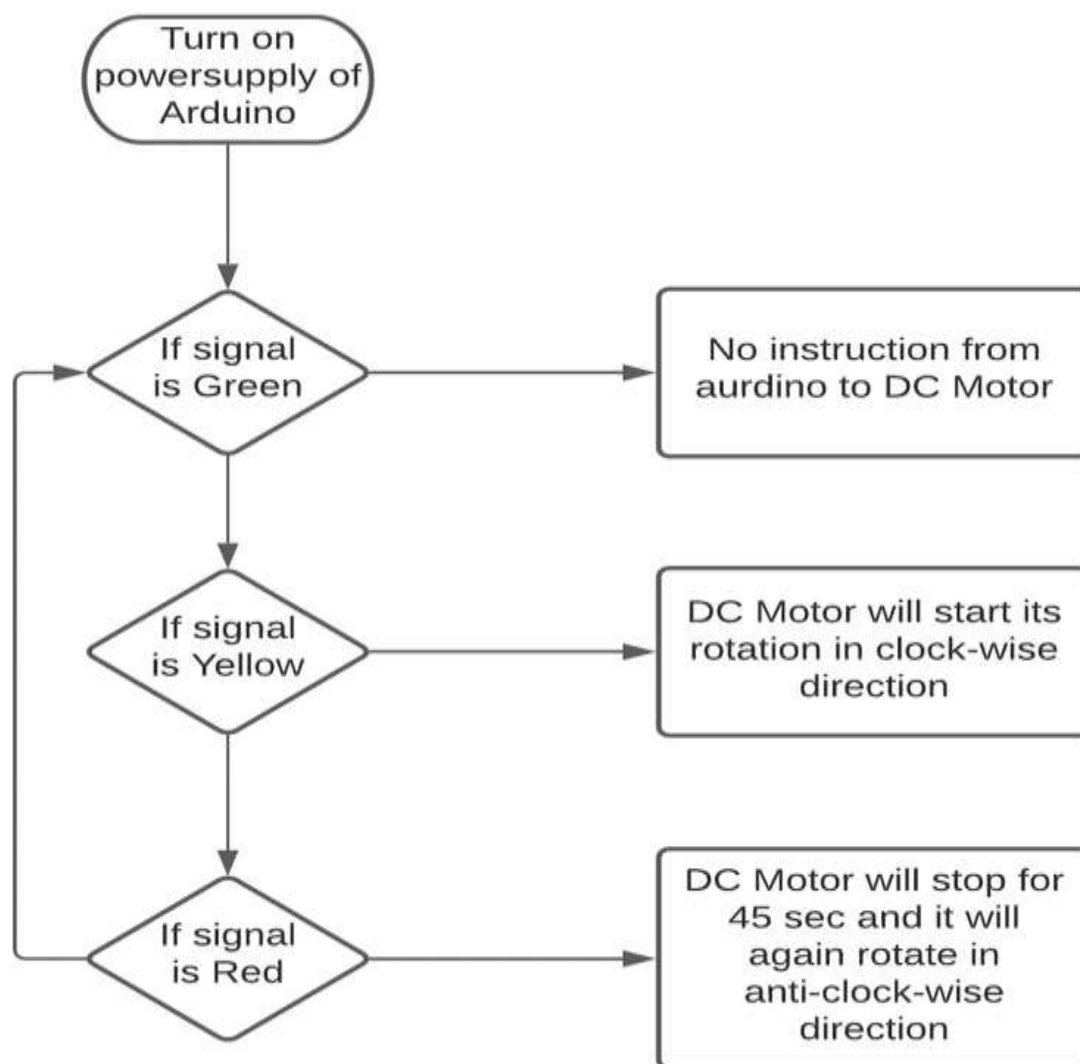


Figure 2: Flow diagram

ADVANTAGES

- Our road block is completely automatic which reduces the need for manual input. Not only is this more cost efficient in the long term but it also ensures that our access control security systems are more dependable.
- Traffic rules will be followed sincerely as the road block will control the flow of traffic in a given route or road.
- There will be a drastic decrease in accidents which occur due to irrational driving on or near the intersections.
- The crossing of the roads will be much more easy and safe as the road block is placed behind the zebra crossings.
- This road block can also be used for security, for example near a parking lot or on the gate of a building so as to keep track or stop the incoming vehicle approaching the gate.
- Maintenance cost is minimal as compared to road safety equipment.

FUTURE SCOPE

Currently our roadblock is automatically moving accordingly to the colour of traffic signal, however if some emergency vehicles like ambulance, fire brigade, etc. arrives while signal is red there is no movement in roadblock. So in order to overcome this issue we need some advance sensors and automation technique. Our current project is working on electric power supply, so in future we will migrate it on solar.

CONCLUSION

In order to make road travelling more safe and to reduce number of road accidents which occur because of violation of basic traffic safety rules, we are trying to implement automated road block which forces people to stop at the traffic signal as it doesn't allow the vehicles to jump the signal beyond the bump line. There is a major advantage that no manual labour is required for the working of the mechanism as it is fully automated. We can also use it in private area such as hotels, buildings, etc.

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