

ZONE BASED SPEED CONTROLLER OF VEHICLE USING IOT

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ABSTRACT

This project aims at automatically controlling the Speed of vehicle at speed restricted areas such as schools, hospital zones etc. These days the quantity of schools, medical clinics and shopping centers are greatly expanding in metropolitan urban areas and a large portion of these are on street.. As it is intensely packed at times of heavy traffic, controlling pace of these spots is high worry for maintaining a strategic distance from mishaps. Existing frameworks are questionable as far as controlling rate at specific zones and furthermore less speed nowadays the drivers drive vehicles at high speed even in speed limited areas without considering the safety of the public. A RFID is utilized for this reason. One RFID Reader will be placed inside the vehicle read the RFID tag set either at speed limit signboard or at traffic light. A controlling module in the vehicle at that point takes the choice and control the speed accordingly.

KEYWORDS: RFID Reader, RFID Tag, Arduino Mega, L298N driver, HC-05 Bluetooth Module.

I. INTRODUCTION

This paper aimed to plan an equipment prototype for securely monitoring and controlling of vehicle at particular zones using IoT. As Population is massively increased metropolitan cities and it is huge at special places like schools, malls and hospitals. Mostly these places are on road hence controlling vehicle speed at these places are major concern to avoid accidents. Most of accidents are happening because of over speed at domestic roads. Hence, there is scope to research on controlling vehicle speed at particular zones. An identification of obstacles is also one of the important concerns to provide safety to children and senior citizen on roads. There are huge number of research ideas are presented to stop vehicle automatically and also measure speed at particular point. However, these approaches are provided limited performance in terms of vehicle speed and providing information to authorized persons. As many of existing systems are focusing on stopping vehicle when object is identified and there is no system for reducing speed for particular zones using Internet of Things(IoT) thereby motivating to provide hardware prototype for controlling vehicle speed and stopping vehicle in case of object identified. In this paper, an advanced hardware is utilized for controlling vehicle, to avoid delay when implementing for real-time applications. With advance of technology and capacity of computer, controlling of the hardware prototype that is robot is high speed thereby obtaining high performance for realistic applications. To switch from off to on condition or on to off condition, Pulse with Modulation is popularly used in digital systems.

This Usage of wireless RFID technology to detect the areas where speed should be controlled. Speed of the vehicle is reduced while in smart zone. The designed system is equipped with speed reduction system. This system is useful for smart zones like Hospital, School, Colleges etc. One RFID transmitter will be keep in front zone. One RFID receiver connected with the microcontroller will be put inside the vehicle.

The RF beneficiary, over distinguishing the RF transmitted sign will impart sign of speed decrease to the microcontroller. The speed of the vehicle will be controlled through Microcontroller (Arduino mega).DC engines are interfaced through an engine driver.

II. RFID TECHNOLOGY

Radio Frequency Identification (RFID) is a nonexclusive term for advancements that utilization radio waves to consequently distinguish individuals or articles from a separation of a few crawls to several feet. This is an

Automatic Identification (Auto-ID) Technology by which any article can be recognized consequently. Standardized tag, Magnetic Strip, IC Card, Optic Character Recognition (OCR), Voice Recognition, Fingerprint and Optical Strip and so on are likewise recognizable proof advancements. RFID innovation utilize programmed information catch framework which helps in expanding framework proficiency. Mix of tag and peruser is utilized for recognizable proof reason. A code is put away in RFID Tag and this tag is appended to a physical article. Presently object become novel recognizable. The n object transmit code from tag. Along these lines peruser get data about article. RFID isn't really another innovation, however it is applied in new ways. RFID is quickly developing innovation. It offers a lot of bit of leeway over traditional recognizable proof gadget like scanner tag. To peruse the standardized tag, the scanner tag scanner should be inline of sight with the name. It implies that the manual development of the article or scanner is fundamental. RFID, then again can peruse information from tag without view. Likewise no arrangement is essential in RFID innovation. RFID has high understanding velocity and this can work in nearness of obstructions. This innovation is progressively viable when longer read extend, quick checking and adaptable information conveying capacity is required. RFID system can be represented as shown in Fig.1.

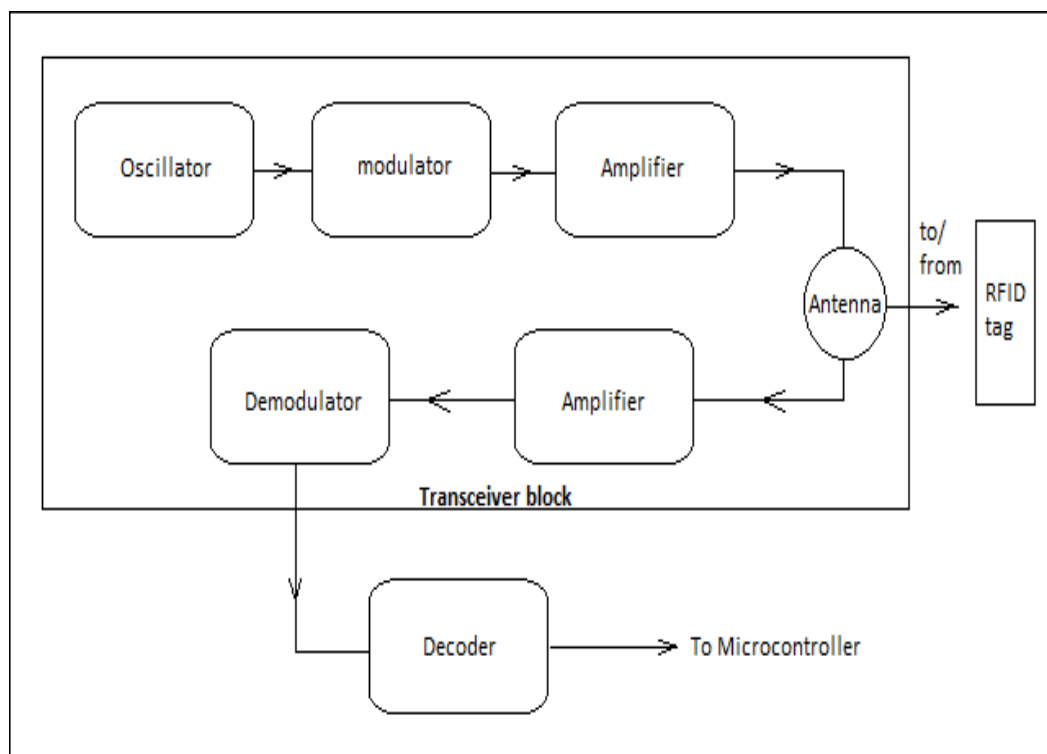


Fig-1: Block diagram of a RFID system

III. DESIGN COMPONENTS

A. RFID Reader

A RFID Reader is a system associated gadget (fixed or versatile) with a reception apparatus that sends power just as information and orders to the labels. RFID frameworks permit the exceptional recognizable proof of things [1][5] or whatever other items which permits following of individual things all through the flexibly chain. In our framework, RFID peruser is utilized to identify the RFID label connected to the vehicle. The peruser utilized in our model can peruse RFID tag inside 3.5 cm. In any case, for the constant model we will utilize all the more remarkable reader which can identify the RFID tag from a more drawn out separation. This is shown in Fig.2.

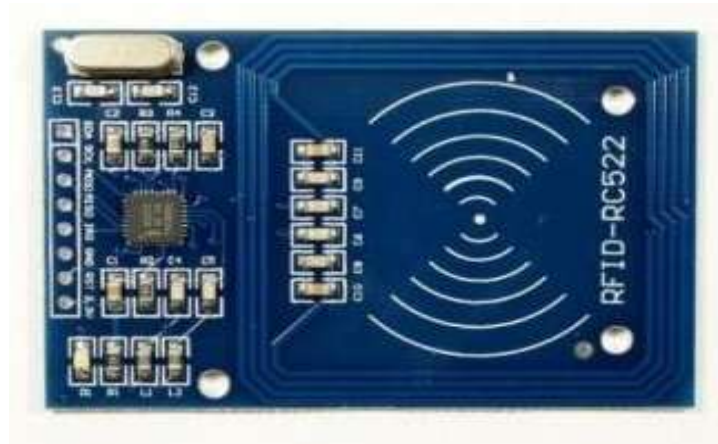


Fig-2: RFID Reader

B. RFID Tag

Radio-Frequency Identification (RFID) is the utilization of radio waves to peruse and catch data put away on a label connected to an item. In RFID framework, each individual thing is furnished with a cheap and little RFID tag. The tag contains a transponder with advanced memory chip. A receiving wire bundled with a handset and decoder produces a sign actuating the tag so it can read and compose information into it. When RFID label goes through the reader zone, it identifies the reader actuation signal. For our model five distinctive dynamic RFID labels are utilized for distinguishing five sorts of vehicle. This is shown in Fig.3.

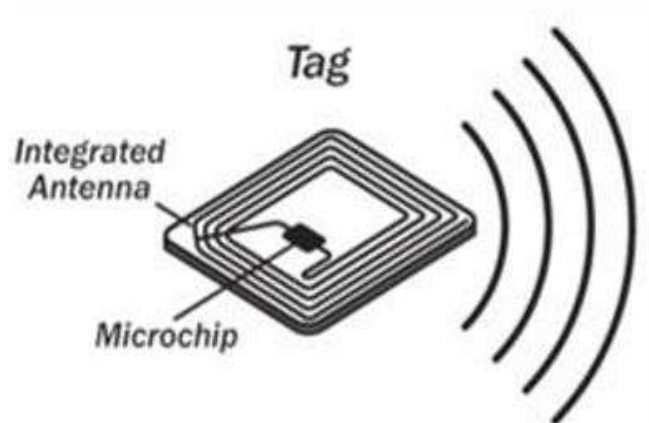


Fig-3: RFID Tag

C. Arduino Mega

Arduino Mega is a microcontroller board dependent on the ATmega2560. It has 54 advanced information/yield pins (of which 14 can be utilized as PWM yields), 16 simple data sources, 4 UARTs (equipment sequential ports), a 16 MHz precious stone oscillator, a USB association, a force jack, an ICSP header, and a reset button [3] [5]. In our model two Arduino mega has been utilized.

D. HC-05 Bluetooth Module

HC-05 Module is a simple to utilize Bluetooth SPP (Serial Port Protocol) module, designed for straightforward sequential port Bluetooth module is completely qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio handset and baseband.

E. L298N Driver

The L298N is a double H-connect engine driver which permits speed and bearing control of two DC engine simultaneously. The module can drive DC engine that have voltages somewhere in the range of 5 and 35V, with a pinnacle current up to 2A.

F. LCD Display

An LCD (Liquid Crystal Display) screen is an electronic presentation module. The 16X2 LCD shows unit's information pins D4 to D7 are interface to the port are p0.16 to p0.19 of the controller for information getting and controlling procedure. The interfacing ports are getting the information and showing on the LCD show. RS-Reset pin interfaces to the port of p1.16 and EN-Enable pin interfaces to the port of p1.17.the peruse and compose pin are associating with the ground. This reset empower pin is utilized to show the accepting information.

IV. WORKING PRINCIPLE OF RFID SYSTEM

A RFID reader remains controlled on constantly and is ordinarily fueled from an outer force source. So when it is ON, the oscillator in it creates a sign with an ideal recurrence yet as the sign quality will be exceptionally less (which may prompt blurring off the sign in the event that it is transmitted straightforwardly) it must be intensified which should be possible utilizing an enhancer circuit, in order to propagate the sign to a more drawn out separation we have to adjust the sign which is finished by a modulator. With every one of these enhancements the sign is currently fit to be transmitted which should be possible by a reception apparatus which changes over the electrical sign into an electromagnetic sign. The RFID peruse signals are wherever with it's proximity to recognize a tag. At the point when a RFID label comes in the proximity of the RFID reader the tag recognizes the peruses signal through a curl present in it which changes over the got RF signal into an electrical sign. This changed over sign alone is adequate to control up the microchip present in the tag. When the microchip gets controlled up, its capacity is to send the information (one of a kind ID) which it is put away in it. A similar way the sign came in, it is conveyed through a similar curl into the air. As talked about before the RFID peruse likewise has a handset in it. At the point when the sign returns from the tag through the radio wire of RFID reader it is taken care of to the demodulator and afterward decoded by a decoder where the first information can be acquired and afterward further handled by a microcontroller or a chip to play out a particular undertaking. Note that the above clarification is for an aloof RFID tag. If there should be an occurrence of a functioning RFID label it distinguishes the sign from the reader just to trigger the circuit and prepare the tag to send the information to the reader since dynamic labels have worked in power source.

V. WORKING OF MODEL

In this model all the vehicles ought to be outfitted with the programmed control framework unit as appeared in Fig 4. This incorporates a RFID peruser, a microcontroller, a LCD screen. Labels are introduced toward the start of speed limit zone and toward the finish of zone. At the point when a vehicle enters as far as possible zone RFID peruser introduced in the vehicle distinguishes the label code. This code demonstrates the speed which is to be kept up at that zone. peruser moves label code to microcontroller. At the point when codes microcontroller gets the code it contrasts this code ID and the which are as of now spared in database of microcontroller.

In the event that match is discovered, the code ID is substantial. Microcontroller realizes as far as possible which is to be kept up in the zone. By then the speed to be kept up at that particular zone will be shown on LCD screen. Microcontroller contrasts the speed of the vehicle and the predetermined speed limit. In the event that vehicle speed is lower or equivalent to the predetermined speed limit, microcontroller shows a message to stay beneath the predefined speed limit on LCD screen. In any case, if vehicle speed is more , speed naturally down to the predetermined speed limit.

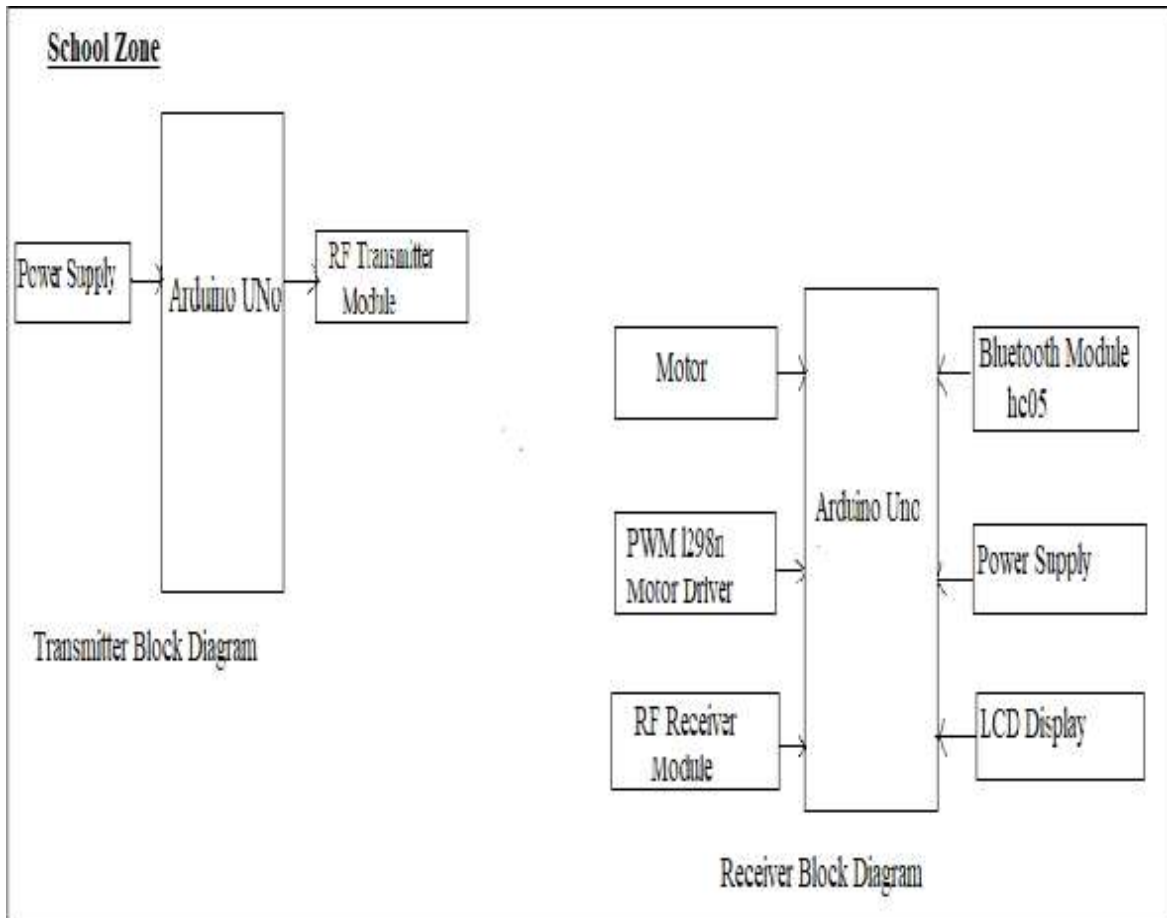


Fig-4: System Architecture

As the resistance of the accelerator unit varies the DC reference voltage given to the pulse width modulator also varies thereby changing the width of the output pulses.

Pulse width modulation is the strategy where the width of the yield beat is fluctuated by differing a dc voltage reference which is given as one of the contributions to a comparator. The other information is a saw-tooth voltage waveform. The width of the yield beats diminishes or increments as the dc reference voltage level increments or diminishes individually. This pulse with modulation will be delivered by the PWM is given to the engine driver unit for controlling the speed of the engine. At the point when the beat width is huge, the speed of the engine increments and when the beat width is little, the speed of the engine diminishes. At the point when vehicle comes to outside the label run, microcontroller expels the command over the vehicle and whole control is moved back to the driver. Here we can utilize dynamic or uninvolved labels relying upon the power of traffic. These labels contain a specific novel code relating to the speed on as far as possible sign sheets. This specific code ID alluding to the speed to which the vehicle's speed must be decreased is transmitted by the tag to the RFID peruser. A theoretical of model has been appeared in fig.5.

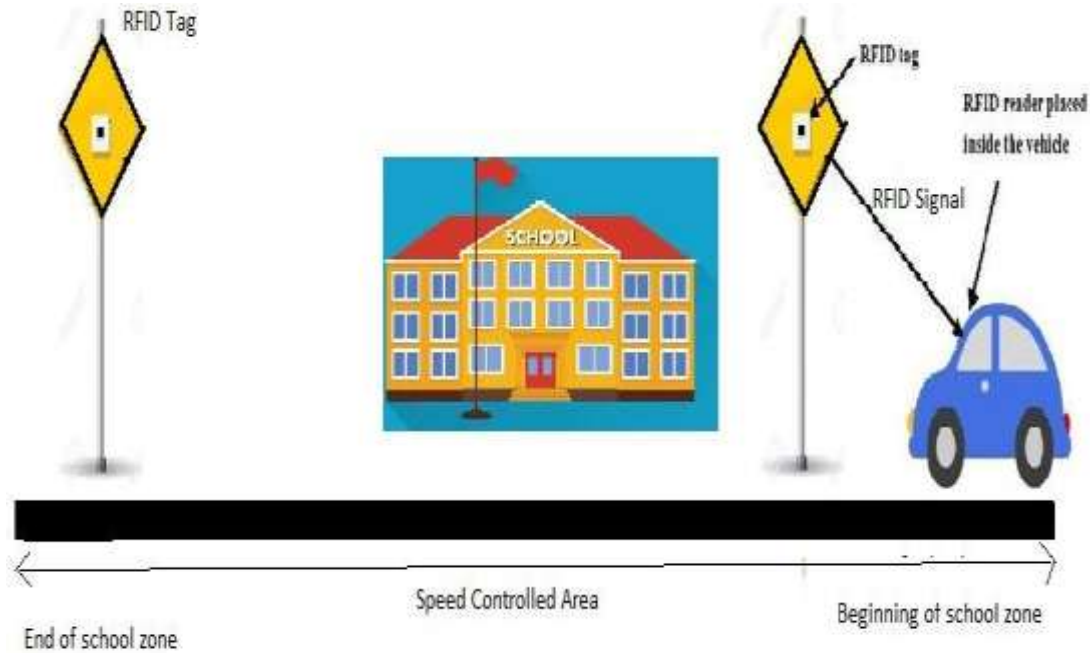


Fig-5: Abstract view of model

VI. CONCLUSION

This paper is proposed a propelled zone based speed control of vehicle in this manner accomplishing less rush hour gridlock and maintaining a strategic distance from mishaps. The IoT based zone based speed controller for mishap counteraction is delivered an equipment model subsequently recreating the outcomes at specific days. The model is given elite than existing strategies. Henceforth, this paper is introduced a practical and dependable framework for staying away from accidents.

FUTURE ENHANCEMENT

In this undertaking we can actualize utilizing GSM and GPS to know the speed and area of vehicle to shrewd mobiles at home or vehicle proprietor and traffic police too.

VII. REFERENCES

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