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Hidden and Narrow Road Traffic System Using IoT

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ABSTRACT: The aim of our project is to develop a Hidden and Narrow Based traffic light System using IOT. the continual growth in vehicle's number has been increased the congestion of traffic in maximum urban places within the planet . The insufficient space to further expand the road and also the budget to further construct new roads in every city, the country must believe other method to unravel this issue. instead of following the traditional way of just expanding the roads, a system should be adopted which can help reduce the traffic problems. Nowadays, the main problem in countryside's are occurrence of accidents and vehicle congestion due to rapid increase within the number of automobiles. so as to scale back this problem, we will develop a alerting device which senses big vehicles and this alerts people travelling where the roads are very narrow and hidden. during this system, we'll use IR sensors to live the vehicle height. we've to mount two IR sensors for each road; the space between these sensors will depend on nature of traffic on a selected junction. These sensors will sense the traffic thereon particular road. of these sensors are interfaced to the PIC microcontroller. supported these sensors, controller detects the vehicles and LED displays light consistent with instruction from microcontroller. we've also developed a IOT module during which all the histories of traffic data are going to be saved.

I.INTRODUCTION

The traffic signal was like two-colour, red-and-green light with a buzzer to warn pedestrians before the approaching transition. then , in 1920, this basic design was updated by William Potts to incorporate the tri-coloured red, yellow, and green lights widely used today. this easy , three-color icon has allowed for nearly a century with little change, using modern technologies like automatic timers, diode lights and motion sensors.

Traffic signals are mainly developed to form sure the proper flow of traffic, provide an opportunity for pedestrians or vehicles to cross a junction and help to reduce the quantity of collisions between vehicles .
Traffic signals should be considered once they go to alleviate more problems than they create. Unwarranted signals may end in increased crashes, delays and congestion.

The traffic jam problems are increasing day by day in country side due to the increasing number of vehicles with limited infrastructure. Under this instance , the prevailing traffic light systems which are timer based aren't able to control traffic. to unravel this problem, a true time control system is required which can control the traffic light consistent with vehicle height.For effective traffic management and signal control, all the knowledge about the road traffic system is passed to the online pages using IOT.

II.   PROPOSED SYSTEM

The traffic light issue could also be a critical problem in day to day lifetime of that peoples and governments. Traffic light controller that manages traffic lights of a junction . The system consists of a PIC microcontroller which does all the function according to code. Power supply is given to the microcontroller and thus the IR sensor on both the side of the sense the density of traffic and provides the knowledge to PIC microcontroller. The controller provides output to traffic light . Display the waiting time using LCD Display.

 IR sensors are of three types mounted on either sides of each road. the space between each IR sensors depend on the character of the traffic density. These IR transceivers are used to detect the vehicles skilled it. Traffic master controller receives the signal. When a vehicle passes the road between the IR transceivers, the IR radiation spreads and thus the thing is detected. And vehicle counter is incremented. Then it'll input to the microcontroller, it can change the time delay of signals corresponds to the density value.

The IR transmitter looks like an LED. The white and black LED indicates IR transmitter and receiver. This IR transmitter emits IR rays from it. But we'll view these IR rays through camera. While receiving IR rays resistance is extremely low. we've to place these IR pair on either sides of each road. IR receiver should be ready to receive the IR rays. once we give the power , the transmitted IR rays hit the thing and reflect back to the IR receiver. instead of traffic lights, we'll use LEDs (RED, GREEN, YELLOW). In normal traffic system, we've to glow the LEDs on time basis.

Actually, three modes of lighting transition slots are there: the normal mode, the holdup mode, and thus the soft traffic mode. The three timing slots associated to the normal , jam, and soft modes of traffic are respectively 40, 60, and 20 s. The shifting between these three modes is completed dynamically using software.

III.SOLUTION

A Solution for this problem can be met by installing a warning system in all three roads which is as identical as traffic system. On all the three roads a light system will be installed. The light system consists of three yellow lights. If all the three lights are Green then no big vehicles are coming in any direction and if yellow light appears then it means big vehicle is travelling in any one of the road among the remaining two roads, by seeing this warning people can stop or slow down thus avoiding accidents and congestions. All the information about the road traffic system is passed to the web pages using IOT.

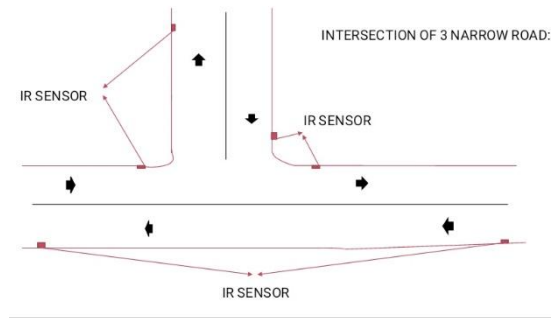**Fig 1. Real time image of the problem.**

Fig 2. Intersection of three bidirectional road.

IV.COMPONENTS REQUIRED

A. HARDWARE COMPONENTS

1. PIC Microcontroller

2. IR Sensors

3. LEDs

4. ESP 8266 Module

5. Menu Keypad

6. LCD

7.Power Supply Module

B. SOFTWARE COMPONENTS

1.MPLAB IDE

2.Proteus Simulation Software

V.WORKING

The system is created of victimization PIC microcontroller, IR sensors, LEDs and liquid crystal {display|LCD|digital display|alphanumeric display} display. In traditional conditions, i.e. once there's no vehicle on the road, the IR transmitter or the IR crystal rectifier transmits IR lightweight that is received by the photodiode, that starts conducting. because the photodiode conducts, the corresponding semiconductor unit conjointly conducts giving associate output of low logic signal (0V) to the microcontroller. a similar principle works for all alternative IR sensor- semiconductor unit arrangement.

The microcontroller makes every crystal rectifier glow for a set quantity of your time. currently if there's presence of vehicles, the communication between the IR transmitter and also the receiver is interrupted, i.e. the photodiode receives less or no quantity of sunshine from the IR diode and consequently the bottom current to the semiconductor unit reduces, eventually creating the conductor visit off condition. This causes associate output of high logic signal from the semiconductor unit, to the PIC microcontroller. The microcontroller consequently changes the glow time of the inexperienced crystal rectifier of the corresponding junction to a better worth. so as range of vehicles will increase, the inexperienced lightweight glows for longer, permitting a fast flow of traffic from the junction facet.
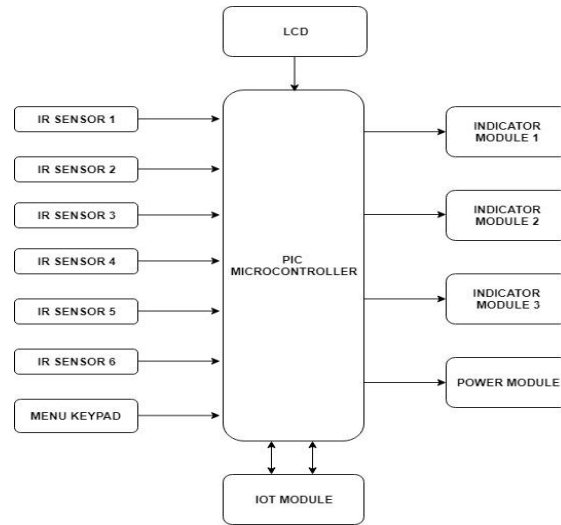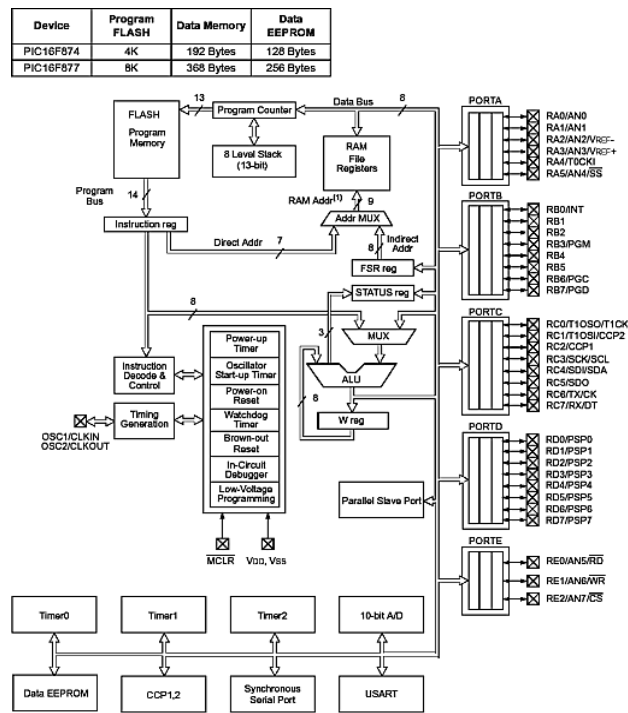
Fig 3. Block diagram of the proposed system.

A. MICROCONTROLLER PIC 16F877A

The PIC16F887 device are covered by this data sheet. The PIC16F887 device are available in 28-pin PDIP, SOIC, SSOP and QFN packages.The PIC16F884/887 are available in 40-pin PDIP and 44-pin QFN and TQFP packages

Fig 4. Block diagram of PIC 16F877A.

B. IR SENSOR

IR device is Associate in Nursing device, that emits the sunshine so as to sense some object of the environment. Associate in Nursing IR device will live the warmth of Associate in Nursing object further as detects the motion. Usually, within the spectrum, all the objects radiate some sort of thermal radiation. These kinds of radiations square measure invisible to our eyes, but

infrared device will sight these radiations.

The electrode is just Associate in Nursing IR diode (Light Emitting Diode) and also the detector is just Associate in Nursing IR pic diode . Photodiode is sensitive to IR light-weight of identical wavelength that is emitted by the IR diode. once IR light-weight falls on the photodiode, the resistances and also the output voltages can modification in proportion to the magnitude of the IR light-weight received.

There square measure 5 basic parts utilized in a typical infrared detection system: Associate in Nursing infrared supply, a transmission medium, optical part, infrared detectors or receivers and signal process. Infrared lasers and Infrared LED's of specific wavelength used as infrared sources.

The 3 main kinds of media used for atmosphere and optical infrared transmission square measure vacuum, fibers. Optical parts square measure wont to focus the actinic radiation or to limit the spectral response.

Fig 6. IR Sensor.
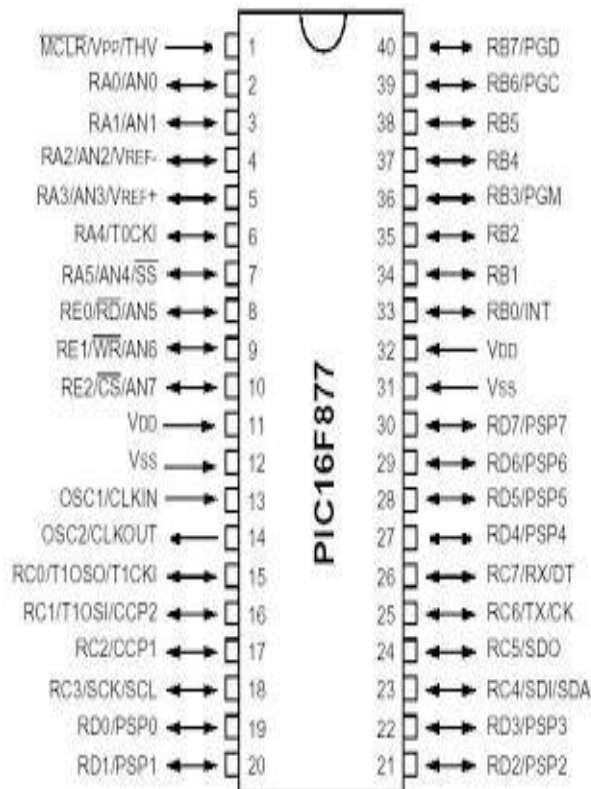
C.WORKING PRINCIPLE OF IR SENSOR

There are differing kinds of infrared transmitters looking on their wavelengths, output power and reaction time. associate IR sensing element consists of associate IR semiconductor diode associated an IR Photodiode, along they're referred to as as photo coupler or Opto coupler.
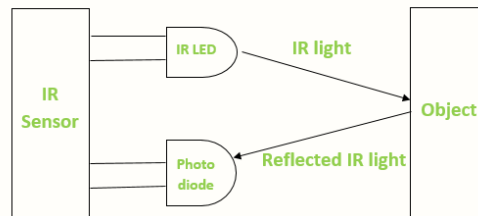

Fig 7. Block diagram of IR Sensor.

VI.CONCLUSION

The implementation in embedded system victimisation web of Things (IOT) and therefore the results showed that this technique is nice during a real situation for enumeration objects in car traffic. this may be a convenient and an easy approach for individuals to achieve to their workplaces and to fulfill their wants on time. Road sensors are wide enforced and have high accuracy in detecting vehicles is their technology maturity.

Though the image model worked terribly expeditiously with exceptional outputs, the real-life scenario goes to be approach morechallenging and exigent. Few of the challenges that ought to be taken into consideration ar listed as follows. Low vary IR sensors might not be a solution for long vary sign system. we have a tendency to might resort to ultrasound or radio detection and ranging techniques for large scale set-ups.

Next is that the influence of stray signals that will alter the reading of device receptors and result in conveyance of title false data to the microcontroller. Periodic checking of the accuracy and exactitude may be a should for efficacious operation of this model image.

Safety first: it's to be fully created positive that no compromise is being created on questions of safety, i.e. a secondary stand-by set-up that may reverse from machine-driven to manual mode, ought to be provided just in case of device OR gate malfunctions so conveyance crowd doesn't transcend management. As a part of future advancements, the traffic check post could also be connected by wireless transmitters by that the crossings ahead could also be Associate in Nursing anticipation of the traffic that's approaching.

This may be achieved the connecting the device network with GPS property and short-wave radio transmission signals. this may act as a feed forward system creating the sign system even a lot of swish and congestion free. we'll conjointly update this method with trendy technology so once a vehicle move even throughout red signal it'll activate an alarm to warn the driving force of the vehicle and can send the tuned in to the traffic law officer withtheimage.

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