

International Journal OF Engineering Sciences & Management Research

SMART PARKING SYSTEM FOR INTERNET OF THINGS

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ABSTRACT

In this paper, we propose a smart parking system detecting and finding the parked location of a consumer's vehicle. Using ultrasonic and magnetic sensor, the proposed system detects vehicles in indoor and outdoor parking fields, accurately. Wireless sensor nodes support a vehicle location service in parking lots using BLE.

In traditional method the devices are expensive and do not connect to a user's mobile and data visualization. Hence we proposed an automatic free slot status intimating system. In this proposed system the parking free slot information is sent to the IOT. Here obstacle sensors are connected to microcontroller which is used to find if the slot is free or not. The slot information is transferred via IOT. If the user is in the zone, they get the data and park the car in the free slot. The slot status is displayed in the LCD.

There is no automatic system to monitor the parking slot and allot the free slot to the vehicles in the shopping malls and other places. In this system the advanced sensors network are used to find the free slot and display the data in the LCD and also send to IOT.

INTRODUCTION

1.1 General

We propose a splendid ceasing system recognizing and finding the halted territory of a client's vehicle. Utilizing ultrasonic and alluring sensor, the proposed structure distinguishes vehicles in indoor and outside halting fields, absolutely. Remote sensor bits support a vehicle region advantage in parking structures utilizing low vitality.

1.2 Objective

The principle objective in this paper, we propose a shrewd stopping framework distinguishing and finding the stopped area of a customer's vehicle. Utilizing ultrasonic and attractive sensor, the proposed framework identifies vehicles in indoor and outside stopping fields, precisely. Remote sensor bits bolster a vehicle area benefit in parking areas utilizing BLE..

1.3 Existing system

There is no programmed framework to screen the stopping opening and designate the free space to the vehicles in the shopping centers and different spots.

1.4 Disadvantages of existing system

1. The labor is required.
2. There is no any gadget to show or send the data.
3. Collision might be happened.

1.5 Proposed system

In this system the moved sensors organize are utilized to find the free opening and show the data in the LCD and furthermore send to IOT. We propose a shrewd stopping framework recognizing and finding the stopped area of a buyer's vehicle. Utilizing ultrasonic and attractive sensor, the proposed framework distinguishes vehicles in indoor and outside stopping fields, precisely. Remote sensor bits bolster a vehicle area benefit in parking areas utilizing BLE.

1.6 Favorable circumstances of proposed system

- No work required.
- This structure will normally transmit the consistent parking space openness data to the learning of customers.

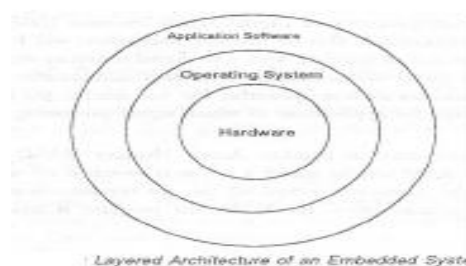
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PROJECT DESCRIPTION

2.1 General

An inserted structure can be characterized as a handling gadget that makes a particular centered showing regarding. Mechanical congregations, for example, VCD player, ventilation system, printer, DVD player, cell phone, fax machine and whatnot are occasions of installed structures. Every mechanical gatherings will be with a processor and striking apparatus to encounter particular fundamental of application near to presented programming that is implemented by processor for meeting that particular need. The presented composing PC programs is in like way called "firm thing". The desktop/adaptable workstation phone a by and large profitable PC. You can employ it for a collection of utilizations, for example, word arranging, playing preoccupations, programming change, bookkeeping, etc. Then after more, the thing in the presented structures is persistently settled recorded underneath:

Central Processing Unit (CPU):-



The Central process Unit (processor, in short) is any of the accompanying: microcontroller, semiconductor device or Digital Signal Processor (DSP). A miniaturized scale controller may be a tokenish effort processor. Its primary fascination is that on the chip itself, there'll be varied totally different components, as an example, memory, serial correspondence interface, straightforward to processed convertor so forth. on these lines, for small applications, a smaller scale controller is that the best call because the amount of outdoor segments needed are going to be less. Then again, chip area unit all the simpler, nevertheless you have got to utilize varied outside segments with them. DSP is employed primarily for applications within which flag getting ready is enclosed, as an example, sound and video.

Input Devices:

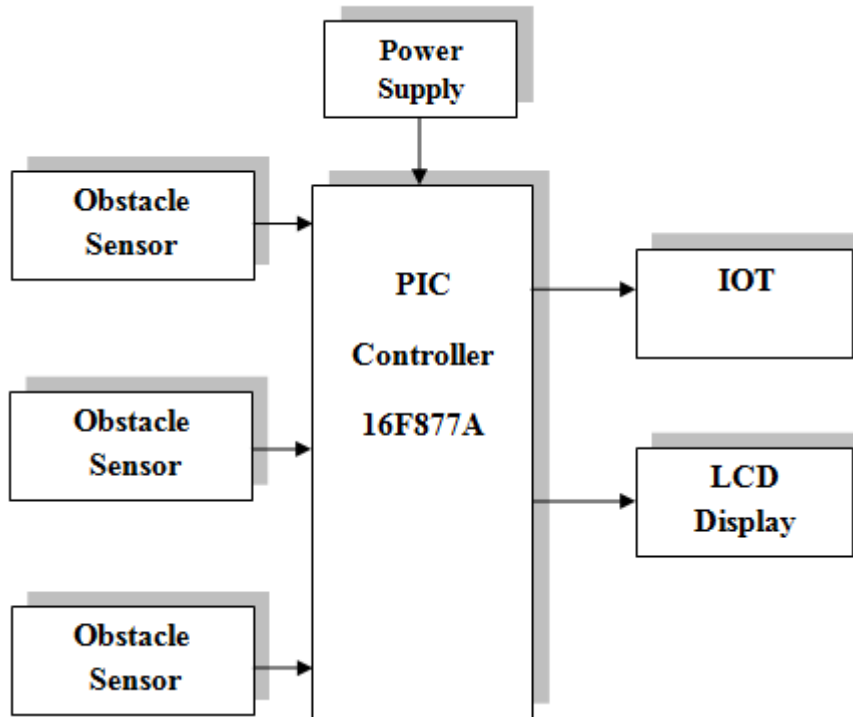
Dissimilar to the desktops, the data gadgets to associate degree put in framework have extraordinarily restricted ability. there'll be no console or a mouse, and later connecting with the put in framework isn't any straightforward assignment. several established frameworks can have a bit keypad-you squeeze one key to administer a specific charge.

Output Devices:

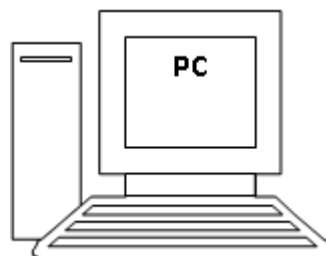
The yield gadgets of the established frameworks likewise have exceptionally strained capability. Some inserted frameworks can have a handful of sunshine Emitting Diodes (LEDs) to demonstrate the well-being standing of the framework modules, or for visual sign of alerts. a bit liquid show (LCD) could likewise be utilised to indicate some imperative parameters.

Block diagram

Parking Section:



Receiving Section:



2.3 Modules

Power supply

The power offer section is that the section that offer +5V to the segments to figure. IC LM7805 is employed for giving a gradual energy of +5V.

A controller circuit evacuates the swells and what is more holds similar dc esteem notwithstanding the likelihood that the data dc voltage shifts, or the heap related to the yield dc voltage changes. This voltage direction is usually gotten utilizing one in all the prevailing voltage controller IC units.

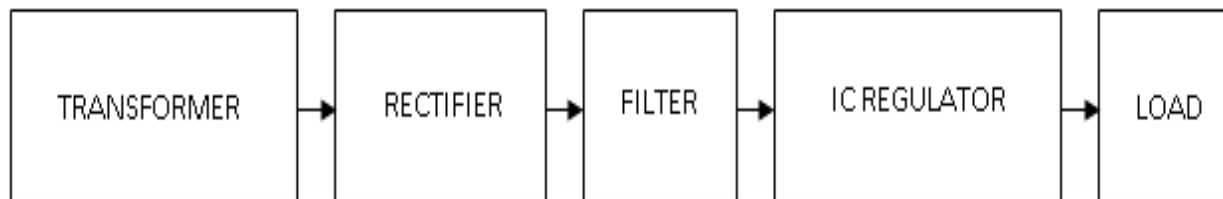


Fig: Block Diagram of Power Supply

2.3.2 Transformer

Transformers amendment over AC power beginning with one voltage then onto successive with very little loss of energy. Transformers work simply with AC and this is often one reason why mains power is AC.

Venture up transformers increment voltage, advance down transformers reduce voltage. Most power provides utilize a stage down electrical device to decrease the dangerously high mains voltage (230V in India) to a safer low voltage.

2.3.3 Rectifier

There ar a couple of strategies for associating diodes to form a rectifier to alter over AC to DC. The scaffold rectifier is that the most important and it creates full-wave unsteady DC. A rectifier will likewise be created victimization solely 2 diodes if an interior faucet electrical device is employed, nonetheless this strategy is once in a very whereas utilised currently that diodes ar less costly.

2.3.4 Bridge Rectifier

At the purpose once four diodes ar associated as appeared in figure, the circuit is named as extension rectifier. The contribution to the circuit is connected to the askew inverse corners of the system, and therefore the yield is taken from the staying 2 corners. provide U.S. an opportunity to expect that the electrical device is functioning fittingly and there's a positive potential,at purpose A and a negative potential at purpose B. the positive potential at purpose A can forward bias D3 and reverse bias D4.

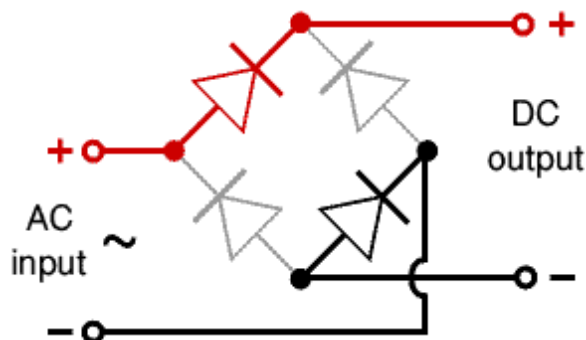


Fig: Bridge Rectifier

2.4 microcontroller

2.4.1 Overview of PIC 16F877

PIC 16F877 is a standout amongst the most progressive microcontroller from Microchip. This controller is broadly utilized for exploratory and current applications as a result of its low cost, extensive variety of utilizations, high caliber, and simplicity of accessibility. It is perfect for applications, for example, machine control applications, estimation gadgets, examine reason, et cetera. The PIC 16F877 features all the components which modern microcontrollers normally have. The figure of a PIC16F877 chip is shown below.



Fig: PIC Microcontroller

2.4.2 Features of PIC16F877

The PIC16FXX series has a lot of advanced and developed options when put next to its previous series. The necessary options of PIC16F877 series is given below.

General options

- High performance reduced instruction set computer C.P.U..
- solely thirty five straightforward word directions.
- All single cycle directions aside from program branches that ar 2 cycles.
- operative speed: clock input (200MHz), instruction cycle (200nS).
- Up to 368×8bit of RAM (data memory), 256×8 of EEPROM (data memory), 8k×14 of nonvolatile storage.
- Eight level deep hardware stack.
- Interrupt capability (up to fourteen sources).
- differing types of addressing modes (direct, Indirect, relative addressing modes).
- Power on Reset (POR).

2.4.3 PIN DIAGRAM

PIC16F877 chip is available in different types of packages. According to the type of applications and usage, these packages are differentiated. The pin diagrams of a PIC16F877 chip in different packages are shown in the figure below.

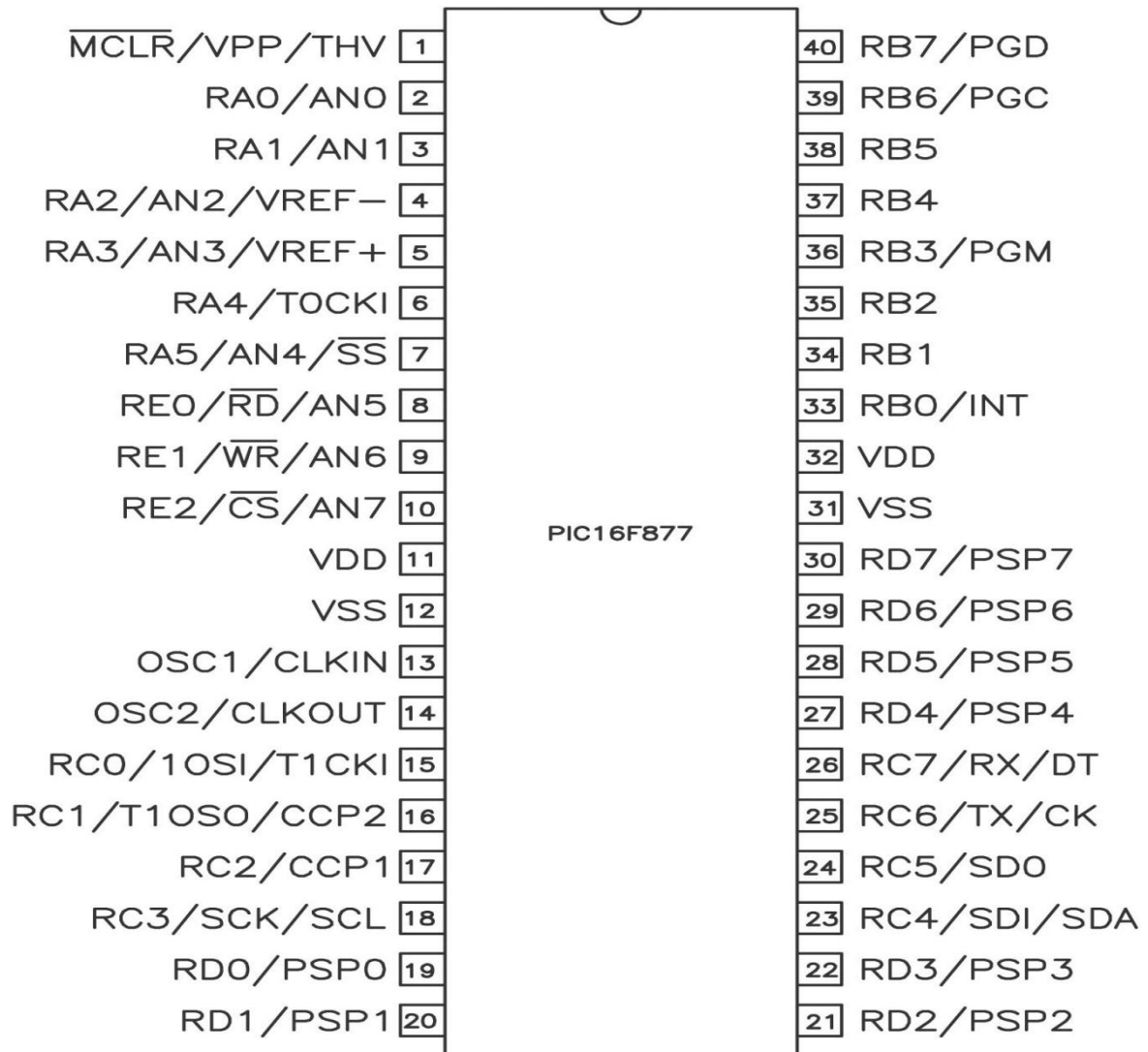
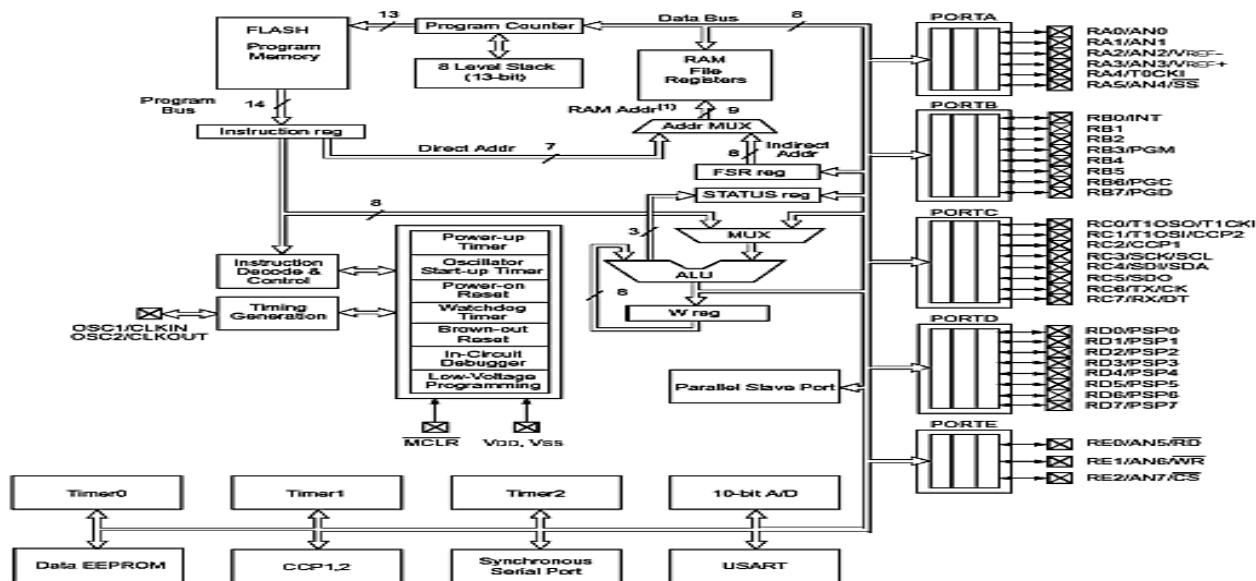


Fig: Pin diagram of PIC Microcontroller

2.4.5 Architecture of pic16f877

The basic building block of PIC 16F877 is based on Harvard architecture. This microcontroller also has many advanced features as mentioned in the previous post. Here you can see the basic internal architecture and memory organization of PIC16F877.

Device	Program FLASH	Data Memory	Data EEPROM
PIC16F874	4K	192 Bytes	128 Bytes
PIC16F877	8K	368 Bytes	256 Bytes



Note 1: Higher order bits are from the STATUS register.

Fig: Internal architecture of a PIC16F877A chip.

2.5 Liquid crystal display

2.5.1 Introduction

LCD screen is associate electronic show module and find an in depth sort of uses. A 16x2 alphanumeric display show is very essential module and is generally utilised as a section of various gadgets and circuits. These modules square measure favored quite seven fragments and different multi section LEDs. the explanations being: LCDs square measure temperate; effortlessly programmable; don't have any confinement of showing extraordinary and even custom characters (not in the least like in seven fragments), activities et cetera.



2.6. Ultrasonic sensor

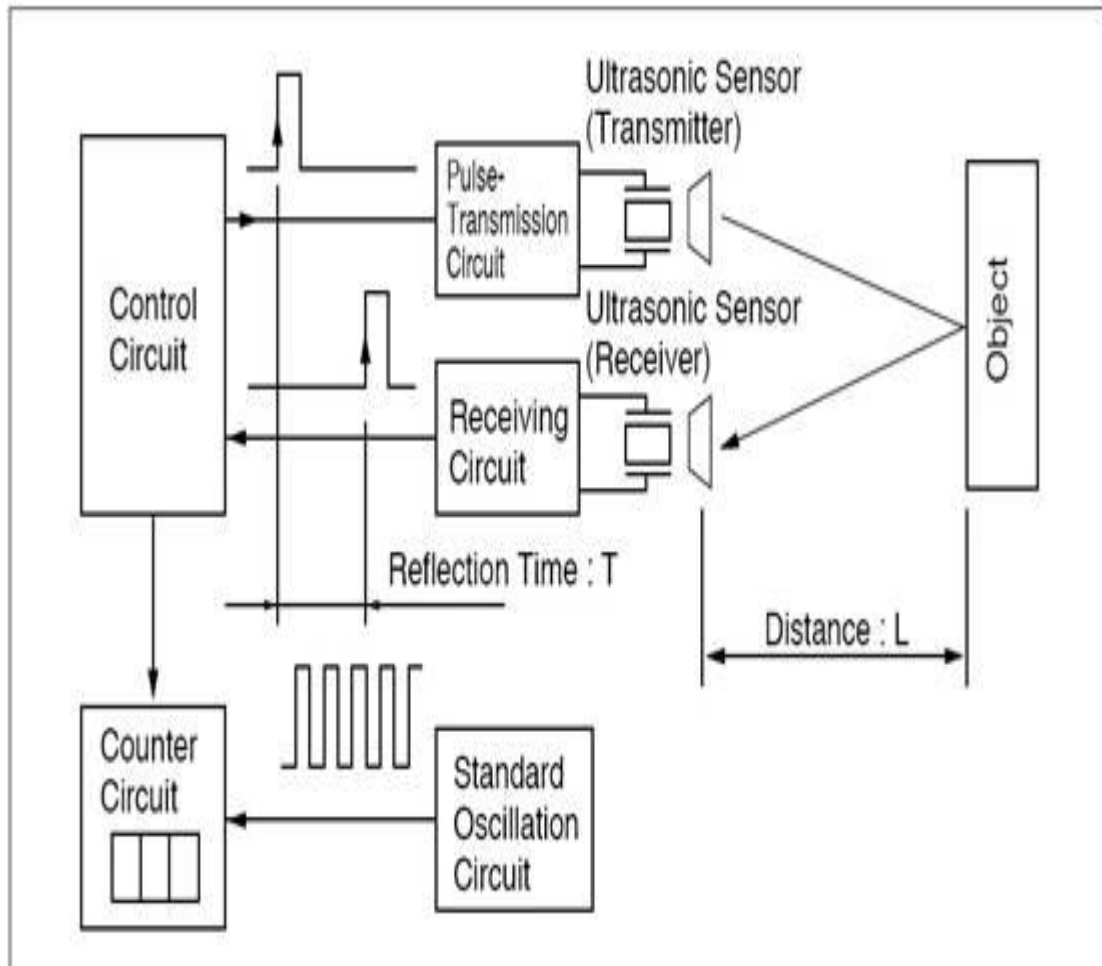
Ultrasonic sensors square measure mechanical management gadgets that utilization sound waves over twenty,000 Hz, past the scope of human hearing, to quantify and calculate cut loose the device to a predefined target question.

Highlights of unhearable sensors:

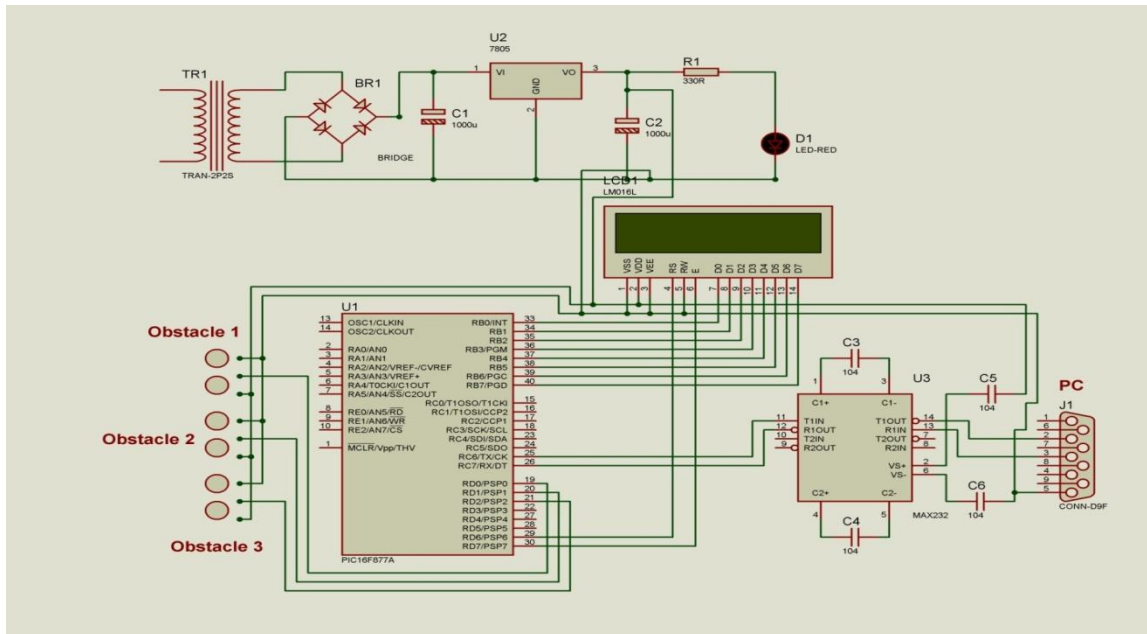
- Devices with conference quality for fast and basic institution
- ULTRA 3000 programming for increased adjustment of sensors to applications

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- Adjustable affectability to the sound shaft breadth for efficient modification of the device attributes as per the appliance
- Temperature pay - makes up for sound speed due to unsteady air temperatures
- Synchronization contribution to forestall cross-talk electrical phenomenon once sensors square measure mounted within closeness of every alternative
- Sensors with advanced in addition as straightforward yields



4.1 Schematic diagram



4.2 Working principle

In customary technique the gadgets are costly and don't interface with a clients portable and information perception. Henceforth we proposed a programmed free opening status hinting system. In this proposed framework the stopping free space data is send to the IOT. Here impediment sensors are associated with microcontroller which used to discover if the opening is free or not. The spaces data is exchanged by means of IOT. On the off chance that the client is in the zone, they got the information and stop the auto in the free space. The opening status is shown in the LCD.

CONCLUSION

In this paper, the savvy stopping framework was proposed on the Bluetooth correspondence between the cell phone and remote sensor bits. It bolstered the recognizable proof of entering and leaving vehicles in stopping opening and remembered the vehicle stopping area. Since the cell phone is utilized, the client has the helpful administration for vehicle stopping area. In our investigations, the proposed framework had shown the exact stopping area benefit in stopping lots. Compared to the past strategy, the proposed framework bolstered the low execution cost. For the future work, the more precise RSSI measurement method will be contemplated.