



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijareeie.com

Vol. 6, Issue 3, March 2017

Design and Implementation of Visible Light Communication System in Parking Environment

P.Parthiban¹, R.Bhuvaneshwari², D.Gomathi³, K.Kokila⁴

¹Assistant Professor, Department of ECE, New Prince Shri Bhavani College of Engineering and Technology, Chennai,
India

^{2,3,4}UG Student, Department of ECE, New Prince Shri Bhavani College of Engineering and Technology, Chennai, India

ABSTRACT: In our modern life, A major issues in public places like shopping malls, It company's and hospitals is parking. parking plays a major role in this private units .providing a sufficient parking spaces in shopping malls is one of the major issue in developing shopping complexes .Shop owners concentrate on designing the interiors only .they don't concentrate on designing the parking slot. By offering the sufficient parking spaces it will increase the customer loyalty and attract the customers to visit shopping mall frequently.

KEYWORDS: Visible Light Communication, LI-FI, Light Emitting Diode, Parking Slots.

I. INTRODUCTION

Visible light communication simply refers data communication .the communication technology which uses visible light for communication is visible light communication .The visible light is what we all see in everyday life. some of the examples are lightning's in the buildings, street lights, traffic signals, electronic appliances such as LED TV'S etc .

The applications of VLC include smart lightning .LED'S are used in most of the electronic devices .Data can be transferred at high speed through LED's. So problem involved in infrared and radio communications are widely reduced using visible light communication.

Visible light communication [VLC] is considered to be a safe and free from hacking .It also increase the efficiency of the parking spaces .As the radio communication technology is replaced with VLC technology, interference can be greatly reduced.

The system consists of two modules namely parking slot enquiry module and parking slot monitoring module. Parking slot enquiry module is fixed in to the car to send the parking information to parking slot monitoring module. Parking slot monitoring module on the parking side collects information about free parking spaces and sends it to the module integrated in to the car. The main advantage of this system is to increase the efficiency of the parking spaces, saves time, and helps the drivers to get the real time parking information.

II. DESCRIPTION

This chapter deals with the block diagram of the project and details of each hardware component chosen in such a way that it suits best for the design of visible light communication based smart parking system .The block diagram consists of two modules:

- Parking slot enquiry module
- Parking slot detector module

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III. METHODOLOGY

1. PARKING SLOT ENQUIRY MODULE

Figure-1 shows the Block diagram of the parking slot enquiry module .Parking slot enquiry module which is integrated into the car, to intimate the drivers about free parking slots. The module consists of an LCD to display the parking information. Here LED act as transmitter and phototransistor act as a receiver .LED transmits the data serially to the module on the parking side; whereas the phototransistor receives the data serially.

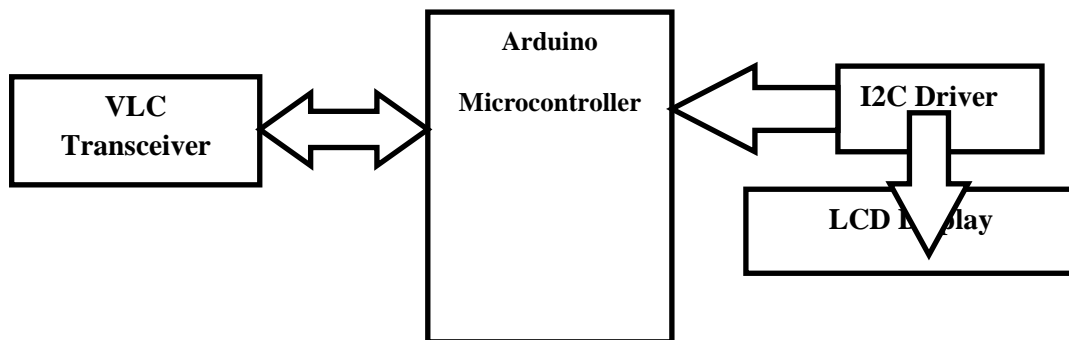


Fig.1. Block diagram of the parking slot enquiry module

2. PARKING SLOT MONITORING MODULE

The block diagram of the parking slot monitoring module is shown in figure2.Parking slots monitoring module is integrated on the parking side ,to detect the free parking slots. It consists of an LCD to display the information .here the LED'S act as a transmitter and Phototransistor act as a receiver.

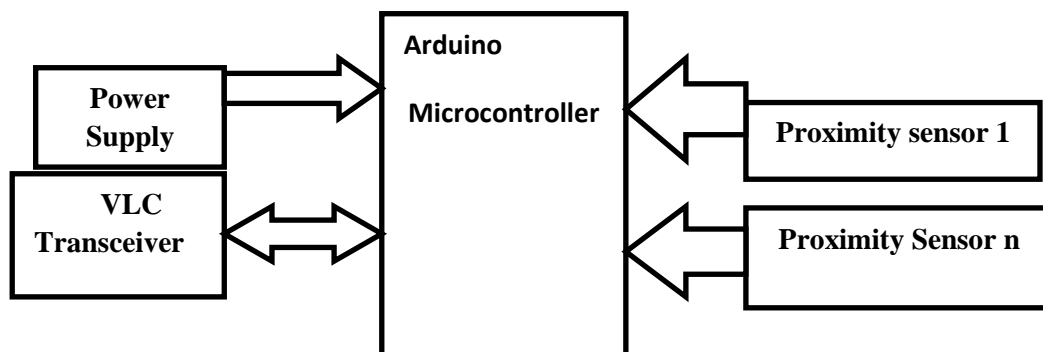


Fig.2. Parking slot monitoring module

IV. RESULTS AND DISCUSSION

The result analysis shows the various condition available in the project .There are four condition available in the experiment as both the parking slot are free ,both the parking slot are occupied and anyone of the parking slot



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empty. If the slots are free then the results as parking available. Anyone slot is free then the results is parking available. If the slots are not free, then the result is as no parking available.

V. CONCLUSION

Thus the visible light communication based smart parking systems monitors and detects the free parking slots and displays the parking slots to the people. Thus the system eliminates the time required to find out the empty parking slot and reduces fuel consumption. In future, the system can be implemented by using the LED bulbs which can be driven to transmit the data .It enhances the data transmission at faster rate to enable user to communicate any time and anywhere in safer manner.

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