Smart Letter Box System Using Obstacle Sensor For Notifies The User By Android Application

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Abstract - This system presents a low cost, less time consuming, safe and effective implementation of Smart Letter Box System through the wireless sensor networks which makes the use obstacle sensor. A special device, called hardware kit is realized and design for this purpose. Obstacle sensors has IR transmitter and IR receiver.IR transmitter transmit the rays. When the rays fall on to the object then it gets reflected to IR receiver, it results that the object is detected. In existing system user is notified by sending a text message through a SIM card, but here we introduce Android Application which gives the notification through the internet. The paper illustrates the description of this device, the android application which receives the notification .This system reduces the Human efforts. The additional component of the current system is a battery backup which is used to avoid power failure of the system. The final aim is to minimize the human efforts, reduce cost as well as power failure.

Key Words: Smart Sensor Box, Sensor , Hardware Kit, Android, MySQL

1.INTRODUCTION

Smart letter box is the new and the latest technology that have been involved from recent times. The use of letter box are largely find in government post box, courier system, and home letter box system in societies. Such letter box are use to post the letter.

In this smart letter box system it involves five parties: the admin who has the highest authority. The area manager, pick-upper, operator and user. The area manager is given different areas. Pick-upper and operator are under area manager. Pick-upper is suppose to pick up the letters from the letter box and operator installs the letter box on the hardware kit. The hardware kit include obstacle sensor. Obstacle sensors has IR transmitter and IR receiver.IR transmitter transmit the rays. When the rays fall on to the object then it gets reflected to IR receiver, it results that the object is detected. Then the notification is send to user using internet connection on android application.

The android application is used to receive the notification from the kit. The hardware kit also include

SIM card which is used for internet connection. Battery backup is provided to the kit so the power failure problem will not occur. Here MySQL database is used to store the data. Data in sense it stores the count of the letters that has been dropped in letter box. The address from where the letter has been received.

The existing system reduces the human efforts as well as cost. This system is the best approach in IoT.
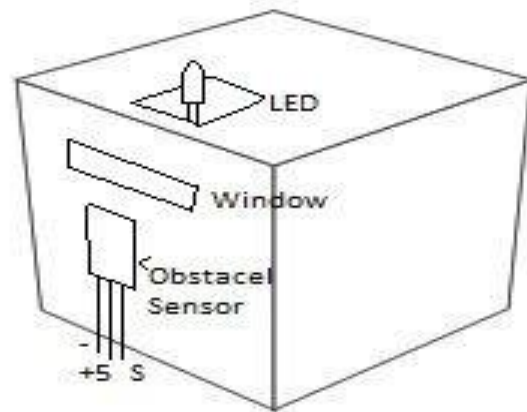

Fig:-Basic diagram of letter box

II. Related Work

A. Hardware Circuit Description

The hardware circuit of smart letter box system is very easy and common. There are four major parts in this system.

1. Sensing circuit: Sensing circuit is a comparator which is build using Im 358 ic. Output of this comparator is directly connected to the digital pin number 3. In this circuit IR transmitter and IR receiver are placed in letter box in the same direction when any obstacle or inserted into the letter box comparator detects the obstacle then it send signal to Arduino.

2. Controller circuit:- After getting signal from comparator, Arduino sends command to GSM module for sending a notification message to a specified number.

3. GSM Module:- Rx and Tx pins of GSM are directly connected with Tx and Rx pins of Arduino respectively. And ground pins of both modules should be connected to each other.

4. Real time clock:- This RTC clock is used here for running the time and when delivery , if letter occurred, letter delivery time of RTC is saved in EEPROM of Arduino.

Fig:- Block diagram of Intelligent letter box

B. Android Application

Android application system: Android is an open handset Alliance. It is a mobile operating system and is developed by Google which is based upon linux kernel. Software stack in android operating system consist of java application which is based on object oriented-application.

A smart letter box system is access anywhere and at any time .The record can be accessed using android mobile operating system .The report generated message is stored in server database. Mobile application is developed and installed in the mobile and the message generated with the hardware kit which has GSM in build in it.

C.DATABASE

MySQL database is used at server side and is connected through GPS to Mobile Android Application .

Literature Survey

Letter box system is actually an indication system, it shows indications whenever there arrives letter in the letter box .Ref 2. It works using on the concept of Obstacle detection. In this arrangement IR Transmitter and IR Receiver are placed near to each other, whenever any obstacle (i.e Letter) comes in front of the obstacle sensor the rays gets reflected and thus we get the output as HIGH

Thus the letter have been detected in the Letter the Box. Thus the letter have been detected in the Letter the Box

In the days of technology postman still comes to our house to deliver the letters, courier and parcels. Because the things courier and parcels can not be sent via email and by any other electronic media. So to get notification of letter delivery in our mail box here we design an intelligent letter box, that provides notification of delivery of letters in our mail box through the message to our smart phone our GSM mobiles.
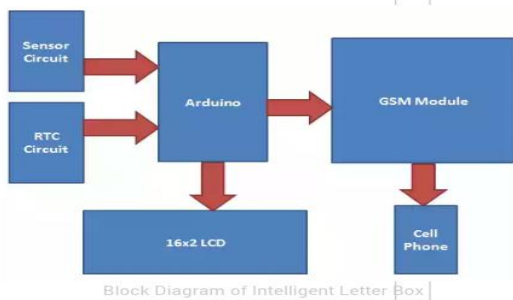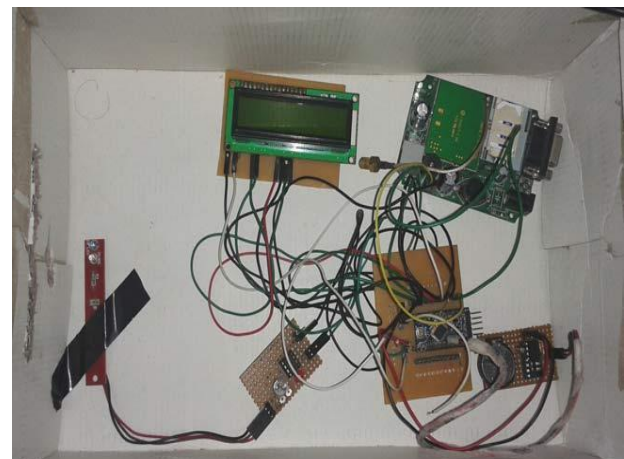

This system uses IR pair that is used to sense the incoming letter in the letter box and a GSM module is used to send message to our phone. And a 16x2 LCD display displays time and letter box status (empty or not), delivery time, date and a real time clock circuit is also used in this system. LED is configured to indicate that letter box is empty or not. When any person insert letter in the letter box, IR sensor sense the obstacle that is letter and then Arduino send the command to GSM module to send notification message to the certain phone number. Than we can collect the letter if possible otherwise after some time. When we collect letters we have to press the reset button that clears the entries of letters,we add an additional feature in which data will not be lost after power failure. Because in this system Arduinos EEPROM is used to store the delivery time of letter and date. This system is designed to save only 6 delivery reports of letters. But it may be further extended. You can try it yourself.

Proposed System

In the system we implemented a smart system letter box ,in which the hardware kit is used to notify user that letter is arrived. The mobile application is used to receive the notification. Here the obstacle sensor is used to detect the object(letter). The RTC clock is used to store the time the delivery of the letter. GSM module is used to send the notification through message and the GPS detects the location at which address the letter has been received. We have used Android operating system in this system which has lot of features integrated in it.MySQL database is used to store the records. This database is easy to maintained records.

CONCLUSIONS

Nowdays, the technology and science is in progress day by day new technologies are invented and new things are created by human. In this system we have studied a smart letter box system that notify the letter is received in the letter box. In our daily life it is not possible for us to check the letter box we proposed this system that the system notifies the user by sending message that letter is arrived. In this paper we conclude that science is non stoppable, new things arrive and growth of smart system.

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