

Design of E-City Bus Tracking System

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ABSTRACT

E-city bus tracking system will serve as a viable notification system that will effectively assist passengers in making the decision of whether to wait for the bus or not. This system is a standalone system designed to display the real-time location(s) of the buses with the use of GSM module technology. The system will consist of an IR transmitter module installed on the buses, receiver boards installed on the bus stops and GSM receiver connected with PC monitoring the whole arrangement. It will also have passenger information system software installed at the bus stops and which will provide user the relevant information regarding all the bus numbers going for his source to destination along with the route details. It will also transmit its bus numbers and route names, with the help of LED transmitter, continuously as soon as the bus comes within the range of the receiver at the bus stop.

Keywords - GSM, LED, IR, PC, standalone

I. INTRODUCTION

Government has facilitated us with enormous facilities. One of them is the public transport facility more over bus transport facility. A huge number of crowds take the benefit of public buses. But there are few of the major problems each individual deals on daily basis. A passenger often faces the problem in deciding if it would be quicker for him to wait for the bus or to hire a cab/auto to reach to the destination. Many of them are often late for their work; students arrive late for classes, as a consequence of their dependency on the arrival and departure of buses they take. The time when they realize that they should have been looked for other options, it's already too late. All this could not take place if we provide passengers with an easy access to see which bus is near to their location and approximate time the bus would take to reach their stop, in real-time. With this little help, they can make appropriate decisions, that if or if not to wait at that stop. E-City Bus Tracking System will provide passengers with such facility. Transportation has a very a vital role to play in day to-day life. Most of the people are being carried by the public transportation system. Because of the ever increasing development the requirement of this system is increasing, that too in time effective manner.

1.1 Irregularities in bus timings:

A proper time table is provided by the bus authorities, but due to number of reasons that schedule is not been followed. This has a very bad impact on individuals about the bus transport system. And irregularities lead to wastage of priceless time of the passenger.

1.2 Problem related to new passengers:

Craze of city life has led to migration of huge crowd in the urban areas each day. When these people wait for city bus, they find it confusing which bus to board on and which not to. Also, people sitting inside the bus find it difficult, where to get out from the bus. A shout from the bus conductor is hardly heard by passengers away from him.

1.3 Lack of control:

As the number of buses that run on roads is much big, it is difficult to keep eye on each of them. Sometimes, it happens that, a bus doesn't wait for one of the stops it should was supposed to stop. These results in great disappointment and anger within the passengers those were waiting at that stop. These are some major problem, which can be resolved to a greater extent after the implementation of the bus.

II. Block Diagram of the Projected system

The overall working of the project is summarized in Fig.1. It shows the intercommunications between different protocols used in this project.

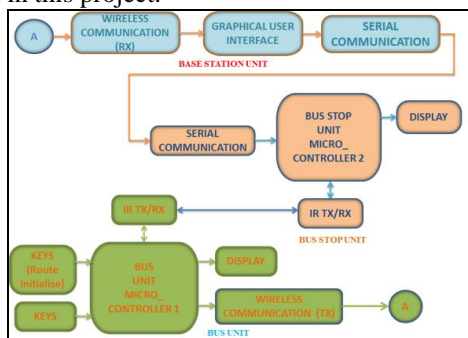


Fig. 1 block diagram of the system

III. Block Diagram Description

2.1. Device Inside The Bus

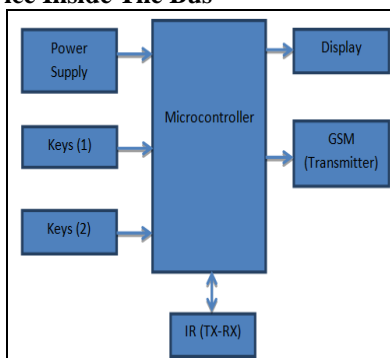


Fig. 2 block diagram of bus unit

This is a microprocessor based kit (Fig. 2) capable of sending and receiving the bus ID and other data wirelessly to and from the device at the bus stop unit simultaneously. The transmission of data takes place when this device comes in line of sight with the device at the bus stop. Also, this unit consists of GSM module used to send data to BASE STATION unit.

3.2 Device At The Stop

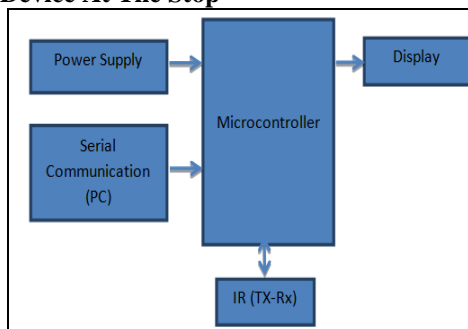


Fig. 3 block diagram of bus stop unit

This device is immovable one (Fig. 3). It works in parallel with device in the BUS unit (Fig. 2). It displays the information sent out by bus unit and simultaneously sends its identity to the BUS unit.

3.3 Device At The Base Station

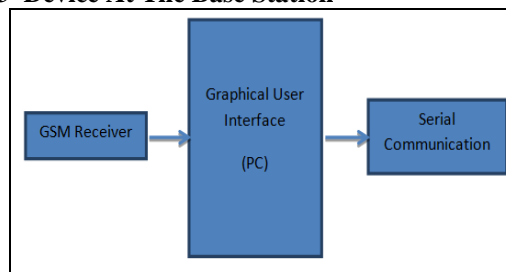


Fig. 4 diagram of base station unit

This module consists of a GSM receiver connected with a personal computer. It receives message from BUS unit informing about the status of the bus, that is, if the bus is delayed or cancelled. The total project works on the faithful communication between the IR pairs installed at the bus stops unit and above the bus unit. It is only this interface which helps the total system inter-communication.

IV. Schematic

4.1 Bus Unit

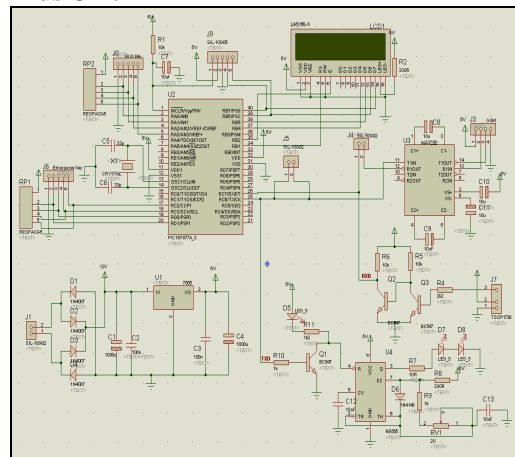


Fig. 5 schematic of bus unit

Schematic forms the back bone of the any hardware circuit design. It shows the arrangement of how all the electrical components to be mounted on circuit boards. Figure above and below (Fig. 5 and Fig. 6) shows the schematic for Bus Unit and Bus Stop Unit respectively.

4.2 Bus Stop Unit

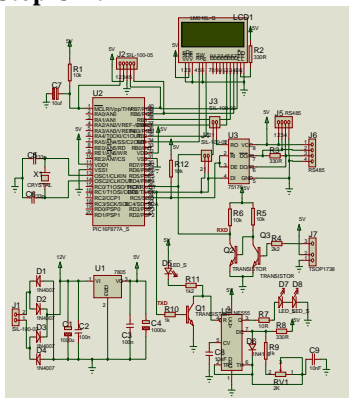


Fig. 6 schematic of bus stop unit

V. Flow charts and algorithms

Flow chat and algorithm for bus unit (Fig. 7)

- Start
- Initialize LCD, Serial parameters
- "A"
- Is serial Interrupt detected? no → go to "B"
- Yes → read Bus Stop name and display on the name on LCD
- "B"
- Is Key detected? → No→ Go to "A"
- Yes→ Is Key → Emergency→Yes→ Send SMS to Base Station
- Is Key Bus ID→Yes→ Send the BUS ID to Bus stop via IR TX
- Go to "A"
- End

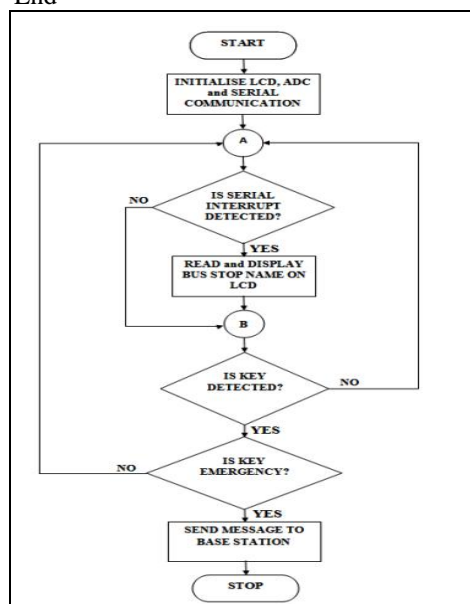


Fig. 7 flow chart of bus unit

Flow chat and algorithm for bus stop unit (Fig. 8)

- Begin
- Initialize LCD, ADC, Serial parameters
- Go to "A"
- Is serial Interrupt detected?
- If No -> go to "A"
- If yes ->is serial Interrupt from IR
- If Yes->Display Bus name
- If No->is serial Interrupt from RS 485
- If Yes-> Display name of Incoming Bus
- Go to "A"
- End

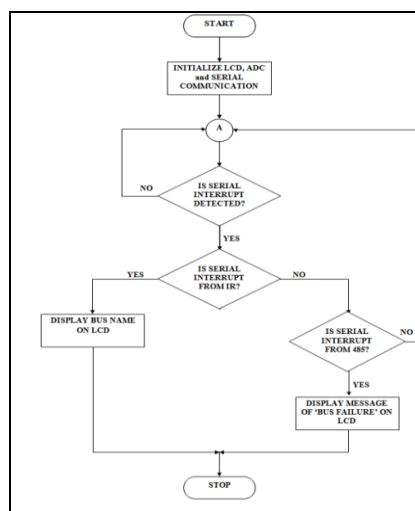


Fig. 8 flow chart of bus stop unit

Algorithm of Base Station Unit

- Begin
- Initialize LCD, ADC, Serial parameters
- Go to "A"
- Is serial Interrupt detected?
- If no-> Go to "A"
- If yes-> is serial Interrupt from IR
- If yes->Display Bus name on LCD at bus stop
- End

VI. Results

The success of the project starts when the bus unit comes in contact with the bus stop unit. There the IR communication takes place and information is transferred. The special feature of bus delay or failure message is the key feature of this project. Also, software known to be VISUAL BASIC is used for Graphical User Display is one of the essential part of this project that's helps in keeping track of various buses attached to this system.

VII. Conclusion

The project "E-City Bus Tracking System" is successfully designed implemented and tested and the following conclusions are made.

- 1) The display at bus stop saves time.
- 2) The present system reduces the work of bus conductor.
- 3) The system involves the tracking of bus at the every stop.
- 4) It also involves the sharing of information of the bus on the bus stops, the bus is going to attain, with the passengers.
- 5) The message through the GSM form Bus Unit will convey the server about the current status of the bus.

[3] www.attigps-vehicle-tracking-systemsg.htm

VIII. Future Scope

There is a wide scope for this project. This is simple GSM based project which can be further modified using GPS for live positing if the bus. GPS gives exact location of the bus which in this project the bus position is judged by the time parameter.

With the interface of GPS device and video camera to this system would take this system to the next level in the field of security. This would help in monitoring the crimes that happen which is witnessed by common people every day. This would prove a major breakthrough in reducing the crime rates.

Also, with use of motion sensors the speed of the bus can be calculated and same information can be used to accurate the measurement of time calculation which here is based on approximation. Also, this project can be made completed automated if speed sensors are used.

IX. ACKNOWLEDGEMENTS

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