Conductor less Bus Ticketing System Using Enhanced RFID Based Method

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ABSTRACT

The proposed method involves installing a smart bank card at the predetermined entry and exit points of the buses, and travellers are offered smart cards. Travellers can pay the full amount at any time at a predetermined location, and their card can indeed be recharged dependent on the quantity paid. A passenger is permitted to enter after inserting his card at the point of entry and having a satisfactory minimum balance on his card. The system immediately notifies the traveller number first from card and enters data. There is also an active remote sensing system to keep track of how far the bus travels. This system sends information to the exit microcontroller, which is equipped with a smart card reader. At the exit, it gets to read the data from connected card reader and deducts the amount based on the passenger's distance travelled. The system also includes a display model that alerts any authorised person to the number of people who are inside at each and every given time. Furthermore, it provides information about the travellers for information management and performs necessary calculations, reducing the conductor's workload. The scheme can be placed at the door, at the front of the driver, or with an assistant to simply check if the cards are properly inserted as well as the passengers have been following the rules.

I. INTRODUCTION

An embedded system is indeed a part of a computer that is used to perform a single task repeatedly and indefinitely, even without human interaction. A computer system which monitors, responds to, and controls an external environment is known as an embedded system. Sensors, actuators, and other input/output interfaces connect the environment to the system. The embedded system must adhere to the timing as well as other constraints imposed by the environment. In general, an embedded system consists of hardware, an operating system, peripheral devices, and communication software that allows it to perform predefined functions [30-34]. Because the embedded system is committed to a specific task, design engineers can optimise it to reduce product size and cost while increasing reliability and performance. Some embedded devices are mass-produced to take advantage of economies of scale [19-26]. Wide application systems will also have individual parts at most points along a continuous spectrum from "specific application" to "embedded," even if the system itself is "needed to execute one or a few extremely important to be able" and is therefore appropriate to call "embedded."

In general, the term "embedded system" is also not a strictly defined term because most systems have some level of expandability or programmability. Handheld computers, for example, share a few elements with embedded systems, including the operating systems as well as microprocessors that power them, but they also allow for the loading of different applications and the connection of peripherals[7-9]. Furthermore, even systems that do not expose fully programmable as a

primary feature must generally support software updates[18].

WSN uses miniaturisation enabled by innovative IC design to few certain full wireless sub - systems to advanced sensors, allowing people and businesses to measure a wide range of things in the material realm and act on this data via IT monitoring and surveillance systems. These motes seem to be completely self-contained and can typically run for many years on a single battery charge before needing to be replaced or recharged [6]. An embedded system is a technology which can be programmed either by user because it has been pre-programmed for just a specific task and is embedded inside the equipment it serves. It is made up of three major parts.

The trend in excellent power embedded processors would be to integrate greater and greater functions through into CPU chip and allow the designer to choose which features to use [17]. A microcontroller is a single-chip computer or computer-on-a-chip. The word micro implies that now the device seems to be small, and the word controller implies that the device could be used to regulate artefacts, processes, or events [5]. A microcontroller is also known as an embedded controller because it and its supporting circuits are frequently constructed into, as well as embedded in, this same devices it controls. Each and every machine that measures, retail locations, controls, computes, or displays data is a candidate for incorporating a microcontroller. The most common single application for embedded systems is in automobiles—almost every car majority of manufacturers contains at least one micro - controller for engine management, and frequently more to control other systems in the car [14-16].

II.   LITERATURE SURVEY

2.1 "RFID-based Bus Ticketing System", Dr.VinitKotak, Ms.ArchanaChaugule, International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 3, March 2016.

The movement of buses in the public transportation system is uncertain on a daily basis due to situations including such road congestion, unexpected delays, infrequent vehicle routing and scheduling times, and other incidents[10]. As a result of this uncertainty, passengers must hesitate for their destination so at bus stop. The above article presents a new RFID-based system whereby each commuter does own a smartcard with just an RFID tag with a unique ID. Commuters can also use an Android app to track the location of about there requested bus in real time and then get an occupancy estimate. The current proposal aims to improve customer convenience and, eventually, to completely remove use of paper tickets in public transportation systems [27-29].

2.2 "Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM" PT.Manikandan, PG.Kalaiyarasi,IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 9, September 2015.

The goal of this project would be to count the passengers using an infrared sensor and automatically calculate the distance travelled by the passengers using a motor and a u-slot sensor, as well as the consumers reported is debited from the RFID card. Furthermore, using GSM and GPS, the proposal system automatically transmits accident information to the nearest hospital [13]. In IR transmitter and the receiver, IR transmitter nothing is more than one type of LED, which is commonly referred to as IR transmitter. Initially, the IR sender and receiver have been placed directly next to each other, allowing this same transmitted IR ray to be received by the IR receiver. However, when a passenger passes between both the IR transmission and reception, the received rays are disrupted[10].

2.3"Smart Bus Ticket Collecting System" S.G.BebishaBeaulin, S.ChristiaSherin, International Journal of Research and Engineering,2013.

The goal of this paper is to use an Android mobile phone and a smart card to issue tickets in a public transportation system. In general, each bus has a conductor who collects money and issues tickets to each passenger[1-4]. It will take a long time and will result in manual error. It contains information such as a person's name, phone number, and address. The RFID reader will read the information contained in the RFID Tag. A message will be sent to the concerned person's mobile phone. The destination must be entered by the user. The appropriate amount will be deducted from the smart card. The PIC16F877A microcontroller is used in this application. In the event of an accident or misuse, a message will be sent via GSM to the checker at a nearby station. GPS is used to pinpoint the location[11-12].
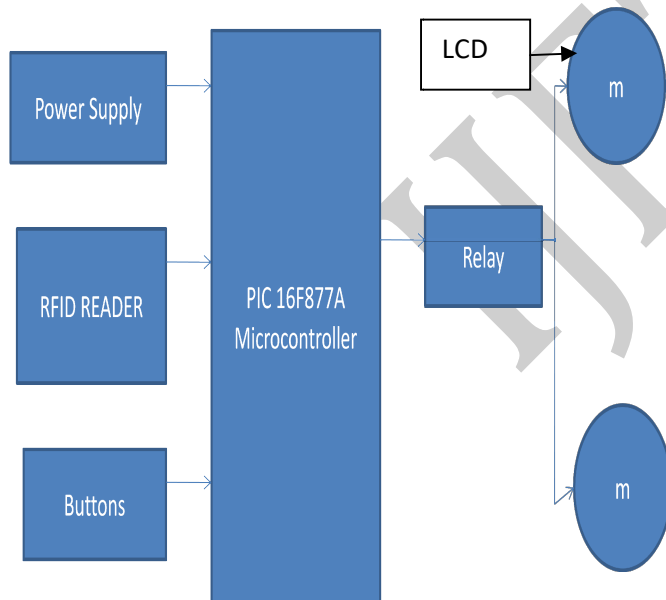
III. PROPOSED SYSTEM

Figure 1 : Proposed working model

This same PIC microcontroller is at the heart of the proposed system, and the pressure and gas sensors are critical components. Figure 1 shows the proposed block diagram.

A. PIC Micro Controller – PIC16F877A

This same PIC microcontroller PIC16F877A is among the most well-known in the industry. The above controller is very easy to use, and coding or programming it is also very simple. Because it uses FLASH memory technology, one of the major benefits is it can be write-erased quite so many times as possible. It does have a total of 40 pins, 33 of which are for source and load. PIC16F877A is being used in a variety of applications. PIC16F877A is also widely used in digital ELECTRONIC CIRCUITS.

B. BUS

The BUS protocol is used to send and receive data from one ancillary to another. It is divided into two types: data bus as well as address.

C. A/D Converters

This analogue to digital converter's main purpose is to convert analogue higher voltages to digital reference voltage. The PIC microcontroller's A/D module has 5 input signals for 28 pin gadgets and 8 input prices for 40 pin gadgets. The procedure of the analog - to - digital is controlled by the special registers ADCON0 and ADCON1. The converter's upper bits are deposited in register ADRESH, while the converter's lower bits are saved in register ADRESL. This operation necessitates the use of a 5V analogue reference voltage.

D. Timers/ Counters

The PIC microcontroller does have four timer/counters, one of which is an 8-bit timer, as well as the remaining timers can operate in either 8 or 16-bit mode. Timers are used to generate accuracy actions, such as creating delay time between two operations.

E. Interrupts

The PIC microcontroller has 20 inner interrupts as well as multiple external interrupt sources that are linked to various peripherals including such ADC, USART, Timers, and etc.

F. RFID System

An RFID tag is indeed a microchip conjunction with just an antenna inside a small package; this same packaging is designed so that the RFID tag can be connected to a tracked object. Radio Frequency Identification (RFID) is an abbreviation for Radio Frequency. The tag's antenna receives signals out of an RFID reader or scanner and then transmits the signal back to the reader or scanner, usually including some extra information. A passive rfid tag is indeed an RFID tag which does not have a battery and is powered by the reader. When a passive RFID tag encounters radio waves from a reader, this same coiled antenna inside the tag creates a magnetic field.

G. RELAY

A relay is a switch that is powered by electricity. Many relays are using an electromagnet to mechanically operate a switching mechanism, but other operation modes are also used. Relays are used when a circuit must be governed by a signal level or when multiple circuit boards should be controlled by a single signal. The first relays have been used in long-distance telegraph circuits to repeat the signal from one circuit as well as re-transmit it to another. Relays were widely used to undertake logical operations in switchboards and early computers.

H. DC Motors

A direct current motor is used to power a mechanical load. The load in this lab is provided by a self - Excited dc generator. By differing the generator field current, the load on the motor can be adjusted. Increase the comprise the basic of a DC generator to increase the load just on DC motor and therefore the armature current.

I. Embedded Systems Programming

Developing applications for embedded systems differs from developing applications for desktop computers. Assembly language associates mnemonic words the with binary machine codes used by the processor to code instructions. For programming embedded devices, assembly language appears to be an obvious choice.
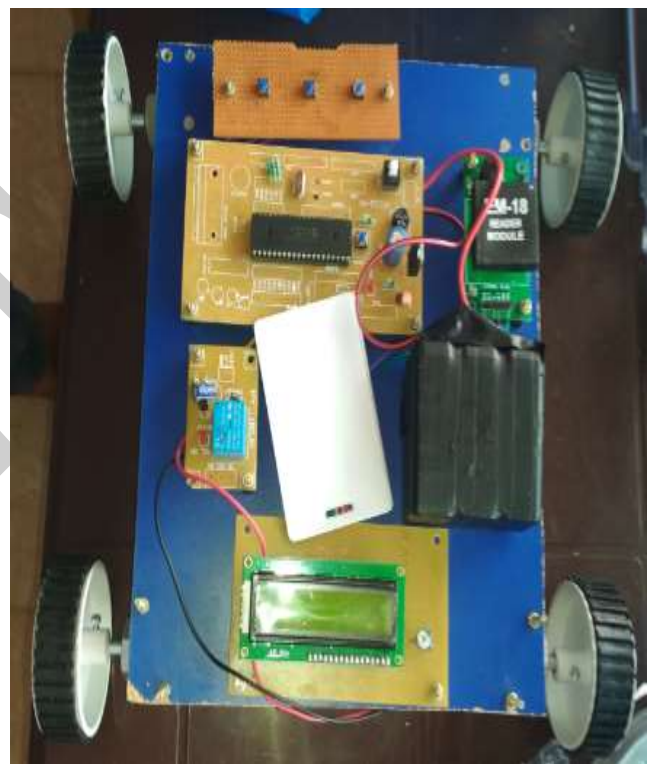

Figure 2. Kit

IV. CONCLUSION AND FUTURE ENHANCEMENT

As a result, the RFID-based Bus Ticketing System facilitates travel without the use of a conductor. The ticket price and time would be displayed on the LCD screen.

Future Enchancement

• We can send travel information using the GSM message passing system.

• RFID-enabled fully automated door lock

system

• The bus would then move only after the passenger has moved a certain distance

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