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RFID Based Kid Security System with SMS & Real Time Location

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Abstract–Now-a-days with the increase in the crime rate and accidents parents have to worry about their children when they are going to schools. To get rid of this fear they need some systems to know the status of their children, this system is proposed to focus on safety of children travelling through school buses. The system describes which gives real time notifications about the location of a child using GPS. RFID. It has two units BUS UNIT and SCHOOL UNIT. BUS UNIT consists of RFID Reader, different sensors and GSM module to issue the alert messages to parents when their children boards or leaves the bus. Temperature sensor, gas sensor, accelerated tilt sensor will be placed within the bus unit to detect fire, gases and tilting of the bus and issues alert messages by giving the location of the bus using GSM and GPS modules. SCHOOL UNIT consists of RFID Reader and GSM Module. The entire data in two units will be processed by using ARDUINO UNO ATMEGA 328 Processor.

INTRODUCTION

At present days all are very much aware about the safety concerns. At the same time parents can admit their children in schools which have high reputation and all facilities. Now-a-days all schools have bus facilities, even though their children are going to school through school bus parents have some worry about their child, are they reached safely or in a dangerous situation (e.g. when the bus met with accidents

then they need help). This project gives a solution for this question. This system also issues alert messages when a child boards and leaves the bus using the RFID tag which was worn by the child by placing that tag before the RFID reader . These sensors and RFID reader are interfaced with the ARDUINO UNO board which has an ATMEGA328 processor. The outputs of this ARDUINO UNO board are given to the GSM module and LCD display. This GSM modem can send the messages to authorized persons according to the received data . LCD displays the message about the accidents [4]. This total system will be presented in a bus, which is called BUS UNIT. Here a SCHOOL UNIT is also there which has an ARDUINO board, RFID Reader and GSM Modem. This unit will issue the messages to parents to con-vey them that their children have reached the school safely, and they are in the school premises.

Literature Review

Our project idea is to put an end to incidents like Innocent children are ending their lives for unworthy reasons . There are many systems which provide security to the school children. The use of RFIDs makes it easier to maintain and usage, but could not give the certain formation about the situation in the bus i.e.…this system does not provide any information when children are in dangerous situations

To track the live location of the bus for the speedy recovery when it is subjected to

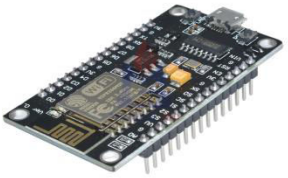
accidents.To intimate the school management and parents about the hazardous
situation in the bus.to avoid the rash driving and to be intimate when the bus is subjected to tilt Our paper devised a method to identify the students are dropped at correct locations and if they are dropped elsewhere the location is identified and an alert is sent to parents. .

Paper 1-
Anwar Ali-Lawati, Sheikh Al-Jahdhami, Asma Al-Belushi, Dalal Al-Adawi, Madhat Awadalla and Dawood Al-Abri, department of electrical and computer engineering, sultan Qu boos university "RFID BASED SYSTEM FOR SCHOOL CHILDREN TRANSPORTATION SAFETY ENHANCEMENT" proceeding of the 8th IEEE GCC conference and exhibition, Muscat, Oman 1-4 February 2015

Paper 2-
RFID-based System for School Children Transportation Safety Enhancement with Attendance System, International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
This project presents a system to monitor pickup/drop-off of school children to enhance the safety of children during the daily transportation from and to school. The system consists of two main units, a bus unit and a school unit. The bus unit the system uses to detect when a child boards or leaves the bus. This information is communicated to the school unit that identifies which of the children did not board or leave the bus and issues an alert message accordingly. The system has a developed web-based database driven application that facilities its management and provides useful information about the children to authorized personnel. A complete prototype of the proposed system was implemented and tested to validate the system functionality. The results show that the system is promising for daily transportation safety.

2.1 Hardware and Software Requirement i) Hardware:

[1]Node MCU: NodeMCU is an open-source firmware and development kit that helps you to prototype or build IoT products. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The firmware uses the Lua scripting language. It is based on the eLua project and built on the Espressif Non-OS SDK for ESP8266.



MCU stands for MicroController Unit - which really means it is a computer on a single chip. A microcontroller contains one or more CPUs (processor cores) along with memory and programmable input/output peripherals. They are used to automate automobile engine control, implantable medical devices, remote controls, office machines, appliances, power tools, toys etc

[2]. GSM SIM 800L

Mini GSM / GPRS breakout board is based on SIM800L module, supports quad-band GSM/GPRS network, available for GPRS and SMS message data remote transmission. The board features compact size and low current consumption. With power saving technique, the current consumption is as low as 1mA in sleep mode. It communicates with microcontrollers via UART port, supports commands including 3GPP TS 27.007, 27.005 and SIMCOM enhanced AT Commands. Features Quad-band 850/900/1800/1900MHz Connect onto any global GSM network with any 2G SIM (in the USA, T- Mobile is suggested) Make and receive voice calls using a headset or an external 8 speaker and electret microphone Send and receive SMS messages Send and receive GPRS data (TCP/IP, HTTP, etc.) Scan and receive FM radio broadcasts Lead out buzzer and vibrational motor control port AT command interface with "auto baud" detection.

[3] LCD display:

LCD (Liquid Crystal Display) screen is an electronic display module and finds a wide range of applications. A 16x2 LCD display is a very basic module that has 2 controllers with 16 Pins which is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi-segment LEDs as they are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations. The status of the system is displayed using LCD.

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that

[4]GSM module:

The NEO-6 module series is a family of stand-alone GPS receivers featuring the high performance u-blox 6 positioning engine. These flexible and cost effective receivers offer numerous connectivity options in a miniature 16 x 12.2 x 2.4 mm package. Their compact architecture and power and memory options make NEO-6 modules ideal for battery operated mobile devices with very strict cost and space constraints.The 50-channel u-blox 6 positioning engine boasts a Time-To-First-Fix0(TTFF) of under 1 second. The dedicated acquisition engine, with 2 million correlators, is capable of massive parallel time/frequency space searches,enabling it to find satellites instantly. Innovative design and technology suppresses jamming sources and mitigates multipath effects, giving NEO-6 GPS receivers excellent navigation performance even in the most challenging environments

5. RFID READER

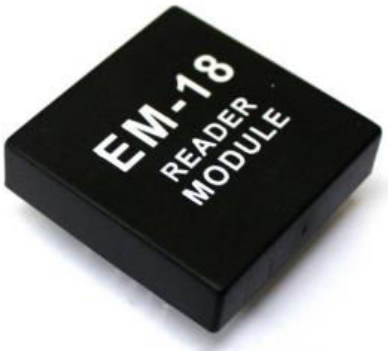


Fig 3.2 (g)

There are three types of RFID readers based on their frequency ranges, low frequency, high frequency and ultrahigh frequency. This EM-18 is a low frequency (125 KHz) RFID reader with serial output with a range of 8-12cm. It is a compact unit with built in antenna and can be directly connected to the PC using RS232

protocol [4]. It is an inexpensive solution for this RFID based application. The Reader module comes with an on-chip antenna and can be powered up with a 5V power supply

6. RFID TAG

There are two types of RFID tags. They are passive tags and active tags. Active tags have battery and continuously broadcast their own signal, they provide much longer read range than passive tags [4]. Passive tags didn't have an internal power source, they were energized by the electromagnetic energy transmitted from an RFID reader. Below figure gives the inside view of the passive tag. A passive tag has an antenna and a chip. Tag antenna receives signal from reader and powers the chip, this signal can be modified according to the unique information present in the chip and retransmitted through antenna

7. Alcohol Sensor

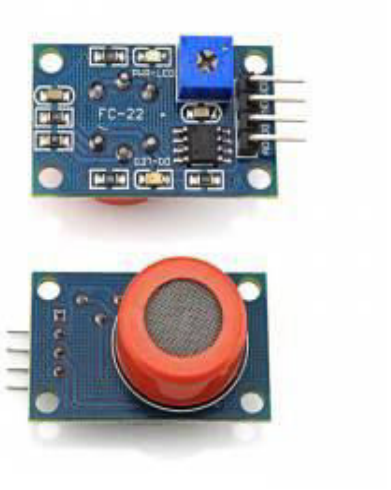


fig3.2(i)

Alcohol Gas Sensor works similar to the common breath analyzer and is used for detecting the concentration of alcohol in breath. These sensors provide analog resistive output on the basis of alcohol concentration and are highly reckoned for their fast response time and high sensitivity. Owing to the simple design, these alcohol gas sensors requires just one resistor for detecting and processing

ii)Software:

The arduino code is actually just plain old c without all the header part (the includes and all). when you press the 'compile' button, the IDE saves the current file as arduino.c in the 'lib/build' directory then it calls a makefile contained in the 'lib' directory. This makefile copies arduino.c as prog.c into 'lib/tmp' adding 'wiringlite.inc' as the beginning of it. This operation makes the arduino/wiring code into a proper c file (called prog.c). After this, it copies all the files in the 'core' directory into 'lib/tmp'. these files are the implementation of the various arduino/wiring commands adding to these files adds commands to the language

The core files are supported by pascal stang's procyon avr-lib that is contained in the 'lib/avrlib' directory

At this point the code contained in lib/tmp is ready to be compiled with the c compiler contained in 'tools'. If the make operation is

successful then you'll have prog.hex ready to be downloaded into the processor.
NOTE:the next release will see each architecture (avr/pic/8051) treated as a 'plug-in' to the IDE so that the user can just select from a menu the microcontroller board to use and the IDE will pick the right compilation sequence.
A program for Arduino hardware may be written in any programming language with compilers that produce binary machine code for the target processor. Atmel provides a development environment for their 8-bit AVR and 32-bit ARM Cortex-M based microcontrollers: AVR Studio (older) and Atmel Studio (newer)

The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in the programming language Java. It originated from the IDE for the languages Processing and Wiring. It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic indenting, brace matching, and syntax highlighting, and provides simple one-click mechanisms to compile and upload programs to an Arduino board. It also contains a message area, a text console, a toolbar with buttons for common functions and a hierarchy of operation menus. The source code for the IDE is released under the GNU General Public License, version

The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE employs the program avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.

APPLICATION:

There are many Applications for GPS tracker for school bus, few of them are Listed below:
This project has the main application in the School bus.It can also be used for kids tracking, or we can say haman tracking.
Advantages of GSM based school bus tracker using GPS:
As mentioned above, it mainly targets child safety.

1) It will save lots of money. By using the bus routing and traffic analysis route can be found.

2) This project offers navigation, time, attendance, and real-time school bus tracking. By using this, you can stay stress free and your children are also safe.

- FUTURE SCOPE

1) Accuracy increases, finding the most efficient route.

2) GPS + GLONASS module can be used instead of GPS module, which will improve the accuracy of the position for<Im.

3) Glonass module filers unwanted noise signals and it improves the quality of the relevant signal.

4) Wireless Security cameras can be added to projects. By using a security camera,

5) Parents or users can monitor their children inside the bus.

CONCLUSIONS

In this system the work is done for the children's safety through a module kit consisting of RFID GPS and GSM to get the exact location and time of the individual shilurer. This system is implemented over speed detection of school bus For installing this system initial cost is high, but maintenance of this system is not of Much cost This system is going to be helpful for the parents as well as the school system. Students are kept on tracking and current location of a child can be detected using this system in any case of the mishap or kidnapping case of a child.

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