ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

Design and Development of School Children Transportation Safety Environment System Using ARM

Thirupathi Mahesh
M.Tech (Embedded Systems)
Department of ECE
St.Mary's Group of Institutions,
Guntur, A.P.

N.V.N.K.Suresh Kumar, M.Tech, (Ph.D)
Assistant Professor
Department of ECE
St.Mary's Group of Institutions,
Guntur, A.P.

Abstract

This project presents a system to monitor pick-up/drop-off of school children to enhance the safety of children during the daily transportation from and to school. The bus unit the system is used to detect when a child boards or leaves the bus. This information is communicated to the parent that identifies which of the children did not board or leave the bus and issues an alert message accordingly.

Introduction

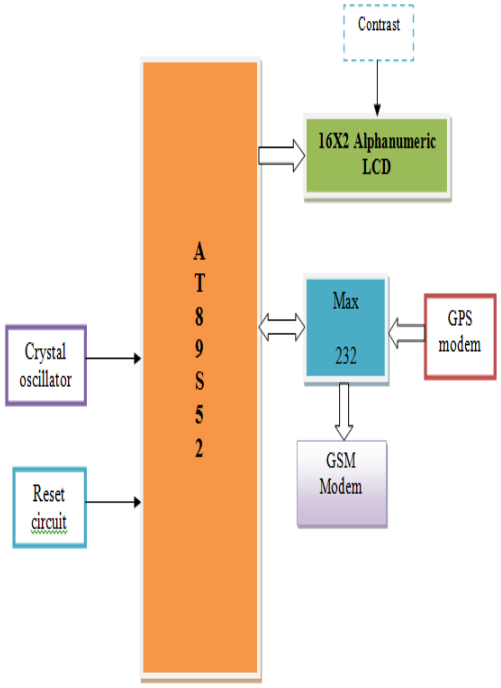
School buses transfer millions of children daily in various countries around the world. While there many issues that might disturb the parents regarding the travel safety of school going children, the paper intends to look into introducing access safety in respect of school buses through bus tracking system that will help the school children's transportation in a secure and safer way. The supervision of the regularity of students during their entry and exit from the bus is difficult to be controlled by drivers, which led to endangering child safety. The phenomenon of forgetting kids on the bus is one of the problems suffered by the children, which has increased significantly in recent years. This has often led to the death of many students on account of suffocation due to the lack of attention of derivers. This project, through entry and exit recordings, aims to create a suitable environment by following certain set of criteria of security and safety for school bus that will have a positive impact on the student and their family.

Existing system

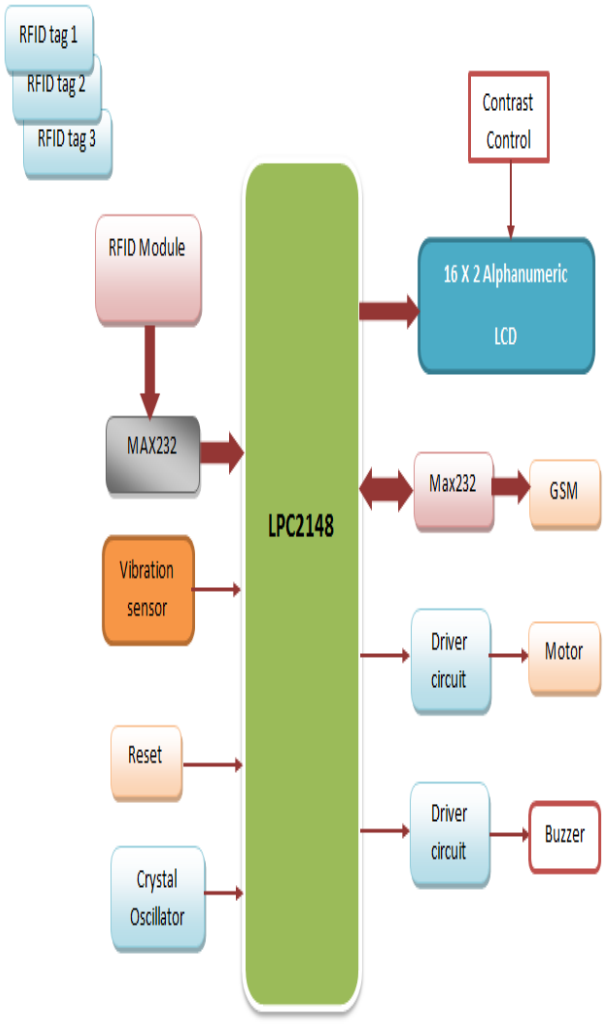
This Project presents an automotive localization system using GPS and GSM-SMS services. The system permits localization of the automobile and transmitting the position to the owner on his mobile phone as a short message (SMS) at his request. The system can be interconnected with the car alarm system and alert the owner on his mobile phone.

This tracking system is composed of a GPS receiver, Microcontroller and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The Microcontroller processes this information and this processed information is sent to the user/owner using GSM modem. This application is a low cost solution for automobile position and status, very useful in case of car theft situations, for monitoring adolescent drivers by their parents as well as in car tracking system applications. The proposed solution can be used in other types of application, where the information needed is requested rarely and at irregular period of time (when requested).

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal



BLOCK DIAGRAM:



Drawback:

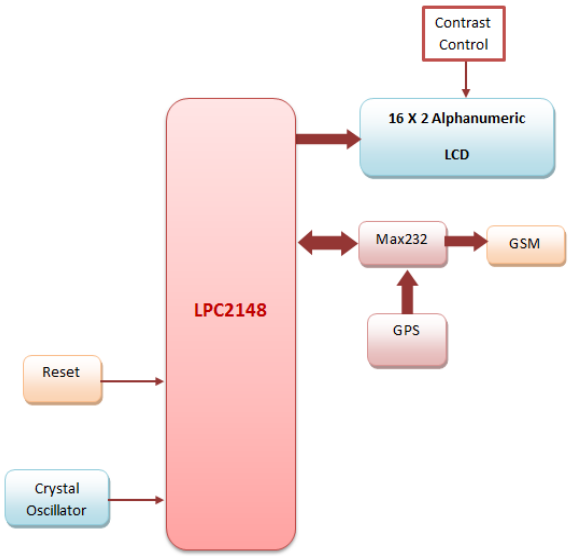
Only tracking is implemented in the above project.

Proposed system

The system has a developed application that facilities its management and provides useful information about the children to authorized personal. 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.This project is mastered with LPC2148 for which RFID module is interfaced to identify a child with unique ID card. Immediately an SMS will be sent to the parent while entering and leaving the bus when card was shown.

So that parent can know the details of children's presence / absence with ease. Parent can also know about the bus location. Upon request an SMS will be sent to the parent about the bus location.Any accident occurred to the vehicle will also be identified using vibration sensor. In that case vehicle stops with a buzzer alert and SMS will be sent in this situation. Here the vehicle is represented with DC motor.

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

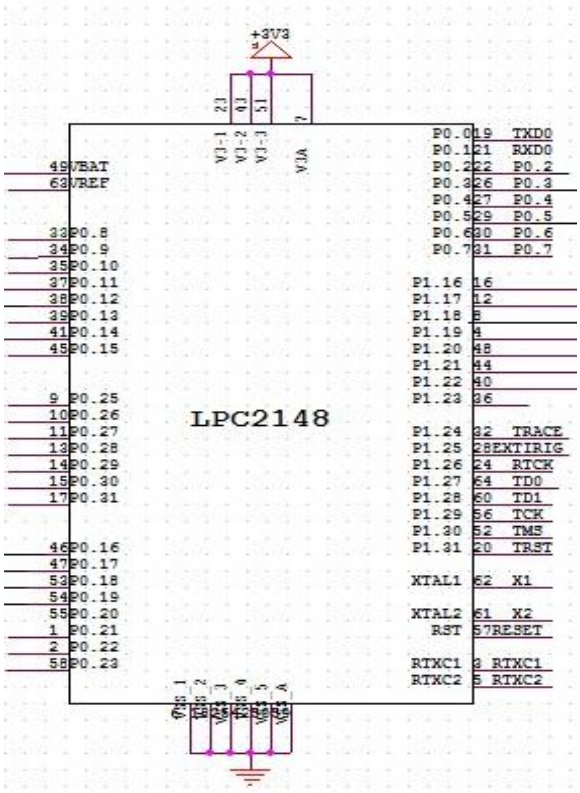


Hardware module used in this project

LPC2148

Key features

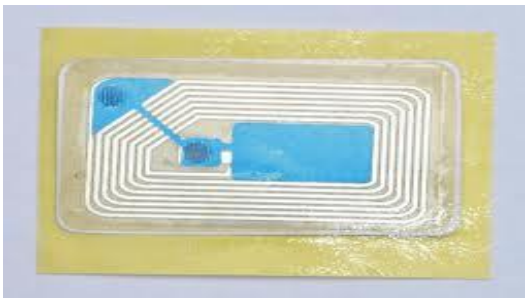
- 16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
- 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory.



- 128-bit wide interface/accelerator enables high-speed 60 MHz operation.
- In-System Programming/In-Application Programming (ISP/IAP) via on-chip boot loader Software. Single flash sector or full chip erase in 400 ms and programming of 256 bytes in 1 ms.
- EmbeddedICE RT and Embedded Trace interfaces offer real-time debugging with the On-chip RealMonitor software and high-speed tracing of instruction execution.
- USB 2.0 Full-speed compliant device controller with 2 kB of endpoint RAM.
- In addition, the LPC2146/48 provides 8 kB of on-chip RAM accessible to USB by DMA.
- One or two (LPC2141/42 vs. LPC2144/46/48) 10-bit ADCs provide a total of 6/14

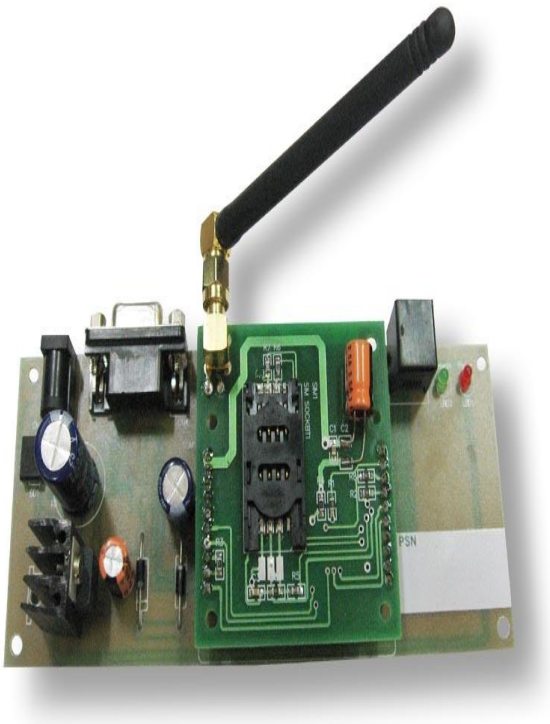
RFID

Radio-frequency identification (RFID) is the use of a wireless non-contact system that uses radio-frequency electromagnetic fields to transfer data from a tag attached to an object, for the purposes of automatic identification and tracking. Some tags require no battery and are powered by the electromagnetic fields used to read them. Others use a local power source and emit radio waves (electromagnetic radiation at radio frequencies).



ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

GSM



MODEM SPECIFICATIONS:

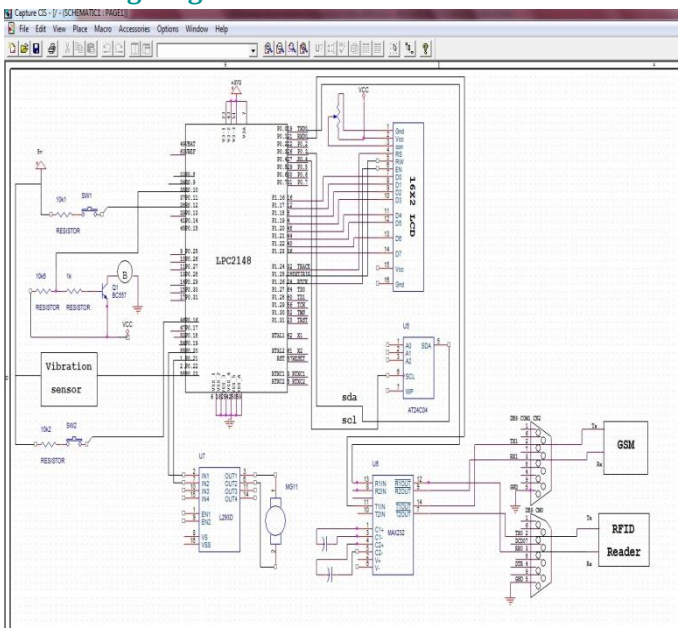
The SIM300 is a complete Tri-band GSM solution in a compact plug-in module.

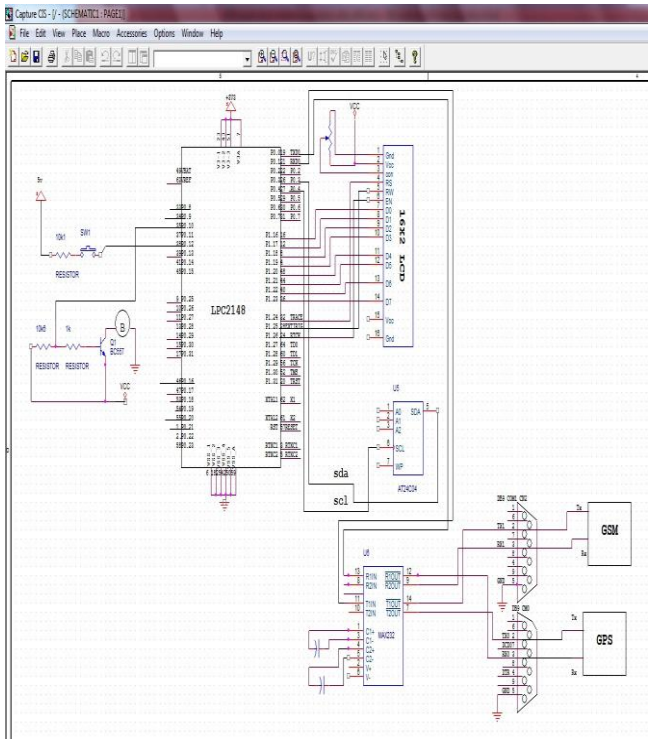
Featuring an industry-standard interface, the SIM300 delivers GSM/GPRS900/1800/1900Mhz performance for voice, SMS, data and Fax in a small form factor and with low power consumption.

The leading features of SIM300 make it deal fir virtually unlimited application, such as WLL applications (Fixed Cellular Terminal), M2M application, handheld devices and much more.

- Tri-band GSM/GPRS module with a size of 40x33x2.85
- Customized MMI and keypad/LCD support
- An embedded powerful TCP/IP protocol stack
- Based upon mature and field proven platform, backed up by our support service, from definition to design and production.

Interfacing diagram



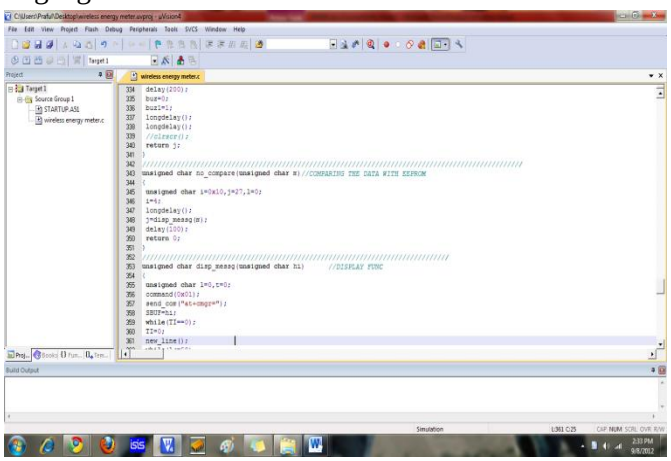


Software tools

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

for further processing. Keil compiler also supports C language code.



Flash Magic

Flash Magic is a tool which is used to program hex code in EEPROM of micro-controller. It is a freeware tool. It only supports the micro-controller of Philips and NXP. It can burn a hex code into that controller which supports ISP (in system programming) feature. Flash magic supports several chips like **ARM Cortex M0, M3, M4, ARM7 and 8051.**

Applications

- Industries are using finger print modems for access control, Stores, attendance recording, and machine operation authentication.
- Banks and ATM
- Voter Identification and electoral enrollment

Conclusion

In this project work, we have studied and implemented a complete working model using a Microcontroller. The programming and interfacing of microcontroller has been mastered during the implementation. This work includes the study of **GSM,GPS & RFIDmodules.**

References

[1] C. Kumar, "RFID based embedded system for vehicle tracking and prevention of road accident". International Journal of Engineering Research-, Vol.1, No. 6, pp3-5, 2012.

[2] H.BEN, & ABDULLAH, K., "SMART TRACKING SYSTEM FOR SCHOOL BUSES USING PASSIVE RFID TECHNOLOGY TO ENHANCE CHILD SAFETY". TRAFFIC AND LOGISTICS ENGINEERING-,. Vol.1,No.2,pp. 191-196, 2013..

[3] S. Shafaat, UAE launches smart school buses to improve students safety system to offer parents direct access to bus status". 1 (2). Available Online: http://www.emaratalyoum.com/local-section/education/2013-04-22-1.568158

ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

[4] Anon., 2011. Smart school bus monitoring and tracking system.IEEE Trans. Single processing, 55 (9), 200-205. Available Online: http://www.hammruki.com/html/products/monitoring.html.

[5] Zonar, 2013. Zpass: Student Ridership Tracking. International research.4 (1), 20-25. Available Online: http://www.zonarsystems.com/products/zpass-student-tracking/.

[6] Anon., 2012. School Bus Tracking – Student Tracker.Single processing. 3(1), 34-45. Available Online] :t: http://www.sifa.com/school_bus.php.