

RFID – based system for school children transportation safety Enhancement

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ABSTRACT

Aim

The aim of the project is to design a transportation safety system for school children based on RFID technology.

Existing Systems:

The existing technology over school transportation and child safety system do not exercise any advance technological in electronic devices that may acknowledge the child parent about the arrival of their child to school, the parents are unaware about the information whether their child has attended the school or not, so to eliminate this problem, we design a RFID Based System for school children transportation and safety enhancement that confer an acknowledgment message to the respected parents about the child's arrival to the school at the boarding point itself.

Proposed Design:

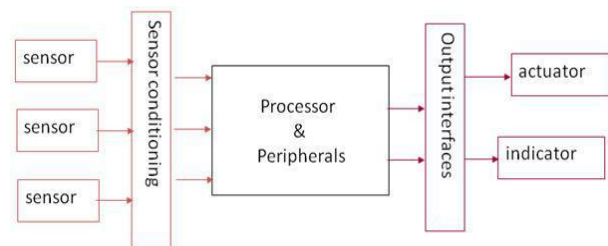
The proposed system utilizes RFID Technology, GPS Technology and GSM Technology and all together integrated into a single system which results in advanced and sensible implementation. This system would be much flexible and reliable with respect to its functionality, since the design includes both RFID and GSM systems for communication

INTRODUCTION

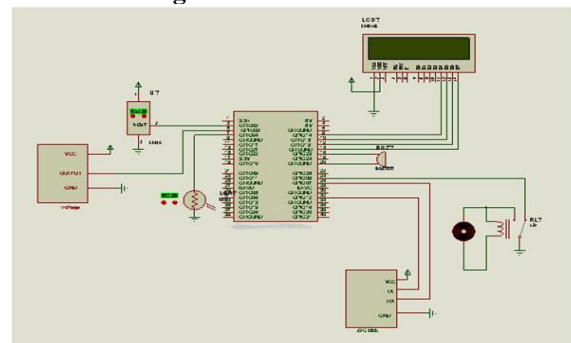
School kids security is the most significant part asked to run before inquire about with the help of front line development. A couple of sharp events constrained to develop an innovative framework to give secure life to adolescents. Watchmen can't feel incredible until the child proceeded back to home safely. Missing of the understudies at school premises, threatening to social parts kidnappings et cetera are growing in an advance. Development should be essential to safe secure the overall population. The made working model considered RF ID Technology and a pushed ARM 7 processor and GSM development. The status of the adolescents is speedily available with the school first and with the parent time to time. The landing status of the tyke is secured by giving the message to the parent early is asked to meet the troubles in the children security. The working model is delivered and attempted discontinuously for unflinching checking

.What is Embedded Technology

The embedded technology is a device or software that is hidden in a large device or structure. System embedded systems, in general, have computer inputs, processors, software, input sensors and outputs, controlling a particular device. The detailed specification of embedded systems is not easy. Unless otherwise indicated, general computer computers (monitor, keyboard, etc.) only have embedded systems. The system is one or several tasks that you organize or perform according to a set of rules, programs or plans. In other words, all units are assembled and grouped together according to a program or plan. An embedded system is a hardware-embedded software, application (s) or part of a specific application or part of a larger product or system. It processes a fixed set of pre-programmed instructions, which controls a greater system (computer, keyboard, display, etc.), which does not have an electromechanical device.



Schematic Diagram:



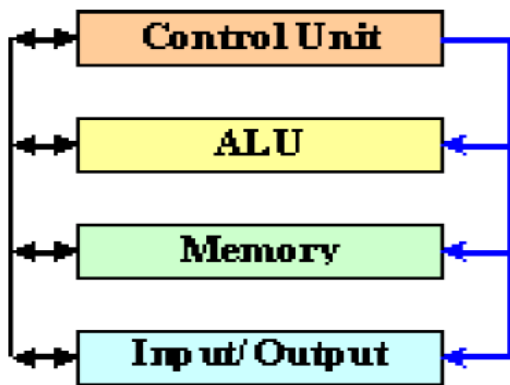
PROCESSORS FOR EMBEDDED SYSTEMS

General topics

This section should give a brief overview of many important topics related to the modern processor.

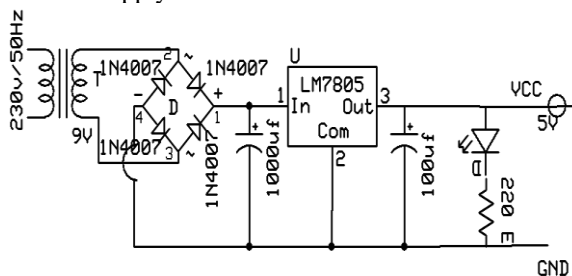
Infrastructure

A general purpose computer has four main sections: arithmetic and logic unit (ALU), control unit, memory and input and output device (I / O). These parts are interconnected. Control units, ALUs, registers, basic I / O and other closely related hardware are known as central processing units. Many different components were included in the initial CPU, but since the CPU has been built on an integrated circuit from the mid-1970s, which is called microprocessor



REGULATED POWER SUPPLY

The power equipment are designed to change high voltage AC mains electricity to a suitable short voltage supply for electronics circuits and other devices. A power supply can be conked out into a series of blocks, each of which performs a particular function. A DC power supply which maintains the output voltage constant irrespective of AC mains fluctuations or load variations is known as Regulated DC Power Supply.



Power supply section

Transformer

Rectifier

A circuit which is used to convert AC to DC is known as rectifier. The process of conversion AC to DC is called rectification

Filter

A Filter is a gadget which evacuates the AC segment of rectifier yield however enables the DC segment to achieve the heap.

Regulator

Voltage controller ICs is accessible with settled (normally 5, 12 and 15V) or variable yield voltages. The most extreme current they can pass additionally rates them. Negative voltage controllers are accessible, chiefly for use in double supplies. Most controllers incorporate some programmed security from intemperate current (overburden insurance) and overheating ('warm assurance'). A large number of the settled voltage controller IC's have 3 leads and look like power transistors, for example, the 7805 +5V 1A controller appeared on the privilege. The LM7805 is easy to utilize. You basically associate the positive lead of your unregulated DC control supply (anything from 9VDC to 24VDC) to the Input stick, interface the negative prompt the Common stick and after that when you turn on the power, you get a 5 volt supply from the yield stick.

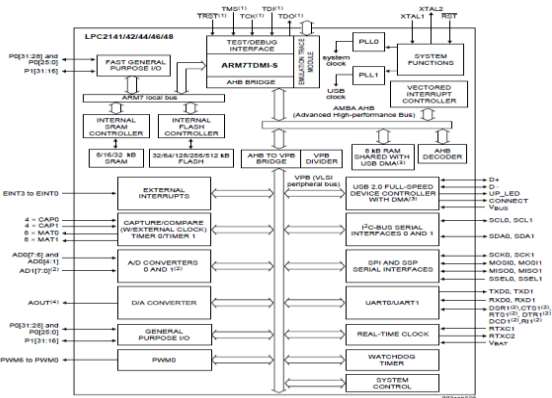


ARM LPC2148

Introduction

The LPC2148 microcontroller depends on a 32/16 bit ARM7TDMI-S CPU with constant copying and inserted follow bolster, that joins the microcontroller with implanted fast glimmer memory extending from 32 kB to 512 kB. A 128-piece wide memory interface and extraordinary quickening agent engineering empower 32-bit code execution at the greatest clock rate. For basic code estimate applications, the option 16-bit Thumb mode lessens code by more than 30 % with insignificant execution punishment.

BLOCK DIAGRAM



(1) Pins shared with GPIO.
(2) LPC2144/46/8 only.
(3) USB DMA controller with 8 KB of RAM accessible as general purpose RAM and/or DMA is available in LPC2146/8 only.
(4) LPC2142/46/8 only.

Architectural Overview

The LPC2148 comprises of an ARM7TDMI-S CPU with copying support, the ARM7

Local Bus for interface to on-chip memory controllers, the AMBA Advanced High execution Bus (AHB) for interface to the intrude on controller, and the VLSI Peripheral Bus (VPB, a good superset of ARMs AMBA Advanced Peripheral Bus) for association with on-chip fringe capacities. The LPC2148 designs the ARM7TDMI-S processor in little-endian byte arrange.

AHB peripherals are distributed a 2 megabyte scope of addresses at the extremely best of the 4 gigabyte ARM memory space. Each AHB fringe is assigned a 16 kB address space inside the AHB address space. LPC2148 fringe capacities (other than the intrude on controller) are associated with the VPB transport. The AHB to VPB connect interfaces the VPB transport to the AHB transport. VPB peripherals are additionally designated a 2 megabyte scope of addresses, starting at the 3.5 gigabyte address point. Each VPB fringe is assigned a 16 kB address space inside the VPB Address space.

AM7TDMI-S Processor

The ARM7TDMI-S is a broadly useful 32-bit chip, which offers superior and low power utilization. The ARM design depends on Reduced Instruction Set Computer (RISC) standards, and the direction set and related disentangle system are substantially less difficult than those of small scale modified Complex Instruction Set Computers. This straightforwardness brings about a high guideline throughput and amazing ongoing intrude on reaction from a little and savvy processor center. Pipeline methods are utilized with the goal that all parts of the handling and memory frameworks can work ceaselessly. Regularly, while one guideline is being executed,

its success or is being decoded, and a third direction is being go ten from memory.

The AR 7TDMI-S processor likewise utilizes an exceptional building procedure known as THUMB, which makes it in a perfect world suited to high-volume applications with memory limitations, or applications where code thickness is an issue.

The key thought behind THUMB is that of a super-lessened guideline set. Basically, the ARM7TDMI-S processor has two direction sets:

- The standard 32-bit ARM direction set
- A 16-bit THUMB direction set

Memory Maps

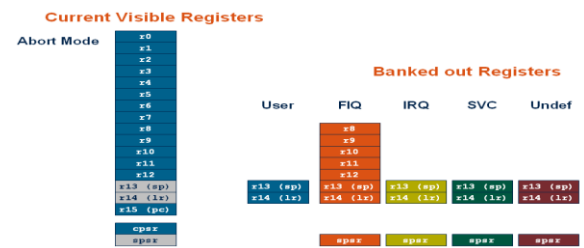
The LPC2148 joins a few particular memory areas, appeared in the accompanying figures. Figure demonstrates the general guide of the whole address space from the client program perspective after reset. The intrude on vector range bolsters address remapping, which is portrayed later in this segment.

Operating Modes of ARM

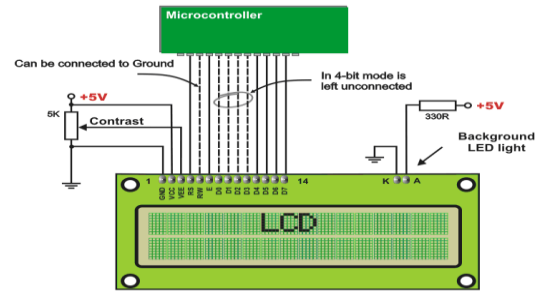
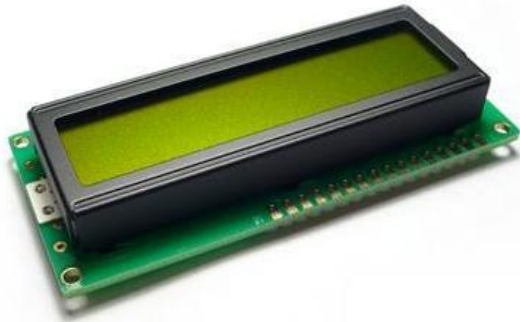
ARM has seven essential working modes

- User:** Unprivileged mode under which most assignments run.
- FIQ** (Fast Interrupt request): Entered when a high need (quick) hinder is raised.
- IRQ** (Interrupt request): Entered when a low need (typical) hinder is raised.
- Supervisor:** Entered on reset and when a product Interrupt guideline is executed.
- Abort:** Used to deal with vague guidelines.
- Undef:** Used to deal with vague guidelines.
- System:** Privileged mode utilizing an indistinguishable registers from client Mode.

ARM Register Set



HD162A Liquid Crystal Display 16*2 Alphanumeric Dot Matrix Module



SERIAL COMMUNICATION

Liquid Crystal Display

Liquid crystal displays (LCDs) have materials which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

LCD Operation

In recent years the LCD is finding widespread use replacing LEDs (seven-segment LED or other multi-segment LEDs). This is due to the following reasons:

- ✓ The declining prices of LCDs.
- ✓ The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
- ✓ Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data.
- ✓ Ease of programming for characters and graphics

LCD Interfacing

PCs can move information in two ways: parallel and serial. In parallel information exchanges, frequently at least 8 lines (wire conduits) are utilized to exchange information to a gadget that is just a couple of feet away. Cases of parallel information exchange are printers and hard circles; each utilizes links with many wire strips. Despite the fact that in such cases a considerable measure of information can be moved in a short measure of time by utilizing many wires in parallel, the separation can't be incredible. To exchange to a gadget found many meters away, the serial technique is utilized. In serial correspondence, the information is sent one piece at once, as opposed to parallel correspondence, in which the information is sent a byte or more at any given moment. Serial correspondence of the 8051 is the theme of this section. The 8051 has serial correspondence capacity incorporated with it, thereby making conceivable quick information exchange utilizing just a couple of wires.

Asynchronous Serial Communication and Data

Framing

Start and Stop Bits

Data Transfer Rate

RS232 Standards

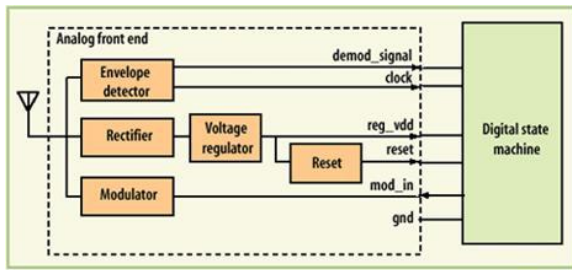
RS232 PINS

MAX 232 Serial Line Drivers

Communication Devices

THE RFID TAG:

Demonstrates the square graph of the RFID label intended for the detecting stage. The label comprises of the label radio wire and the label chip.



GSM Module

GPS MODEM

SOFTWARE REQUIREMENTS

KEIL μ VISION-3

Flash Magic 5.65

Flash Magic is a PC tool for programming flash based microcontrollers from NXP using a serial protocol while in the target hardware.

FEATURES

- Straightforward and intuitive user interface.
- Five simple steps to erasing and programming a device and setting any options desired.
- Programs Intel Hex Files. Automatic verifying after programming
- fills unused Flash to increase firmware security.
- Ability to automatically program checksums. Using the supplied checksum calculation routine your firmware can easily verify the integrity of a Flash block, ensuring no unauthorized or corrupted code can ever be executed.
- Program security bits.
- Check which Flash blocks are blank or in use with the ability to easily erase all blocks in use.
- Read the device signature. Read any section of Flash and save as an Intel Hex File.

- Reprogram the Boot Vector and Status Byte with the help of confirmation features that prevent accidentally programming incorrect values.

EMBEDDED C LANGUAGE

Data Types

We know the word “Data types” in C- Language. Here also the functionality and the meaning of the word is same except a small change in the prefix of their labels. Now we will discuss some of the widely used data types for embedded C- programming.

Data Types	Size in Bits	Data Range/Usage
UNSIGNED CHAR	8-bit	0-255
SIGNED CHAR	8-bit	-128 to +127
UNSIGNED INT	16-bit	0 to 65535
SIGNED INT	16-bit	-32,768 to +32,767
SBIT	1-bit	SFR bit addressable only
BIT	1-bit	RAM bit addressable only
SFR	8-bit	RAM addresses 80-FFH only

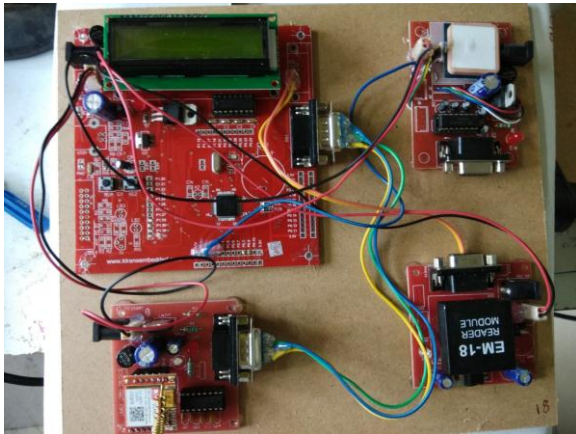
APPLICATIONS

1. School administration frameworks
2. College administration frameworks

ADVANTAGES

- Low Power Consumption Easy To Use
- Straightforward Construction
- Which Will Ensure Safety For Human
- Straightforward Connections
- Simply Wireless
- High Reliable
- Early notice
- Rough In Construction
- Backings Remote Monitoring Feature

RESULTS



[4]Chandra, A., Jain, S., Qadeer, M.A., “G PS Locator: An Application for Location Tracking and Sharing Using GPS for Java Enabled Handhelds,” 2011 International Conference on Computational Intelligence and Communication Networks (CICN) , pp.406-410, 7-9 Oct. 2011.

[5] Andrea Cangialosi, Joseph E. Monaly, and Jr., Samuel C. Yang, “Leveraging RFID in Hospitals: Patient Life Cycle and Mobility Perspectives”, IEEE Communications Magazine , Volume 45, Issue 9, Sep. 2007

CONCLUSION

The consolidation of RFID and GSM progresses for prosperity and security question is key nowadays due to increase in disasters of adolescents gets left behind an incredible open door at the vehicle which may incite end as a result of suffocation. In this wander, transport prosperity structure for school kids has been made. Using this structure, concerned forces, transport driver can be frightened as it's undeniable from the RFID card. Meanwhile, if there was an understudy on the vehicle, the system will send a SMS message to the organization of the school to take the correct decision.

FUTURE SCOPE

By adding GPRS to this we can keep up the database

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[2]Almomani, I.M., N.Y., Ah mad, E.M., Jodeh, R.M., “Ubiquitous GPS vehicle tracking and management system,” 2011 IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AEECT) , pp.1-6, 6-8 Dec. 2011.

[3]Maryan Said Al-Ismaili, Ali Al-Mahruqi, Dr. Jayavrinda Vrindavanam, Department of Computer and Electronic Engineering,Caledomin College of Engineering, “BUS SAFETY SYSTEM FOR SCHOOL CHILDREN USING RFID AND SIM900 GSM MODEM “International Journal of Latest Trends in Engineering and Technology (IJLTET)