

Train Collision Avoidance Using by ARM and Collision Sensor

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Abstract

Each year accidents between trains are increasing due to negligence of intelligent Techniques implemented in the trains and improper control signaling from the train traffic Control station .The train tracking chip modules and Train Identification chip Modules are using to sense the presence of trains on the same track. The signals from the moving train are transmitted through the GSM network to the Stationary trains on the same track and to the TTCS. By using this method one can determine whether the trains were heading for Rear-end collision or Head on collision. The TTCS Transmits control signal to stop or Move the trains.

1. Introduction

Train collision avoidance can be achieved by the detecting of train arrival and the train arrival detection can be used to provide the information to the control station so the base don the data correctness we can avoid the train collision and also this embedded unit will works based on the GSM network so we can send an automatic SMS to the control station. An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part

of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use. Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale.

2. Existing Method:

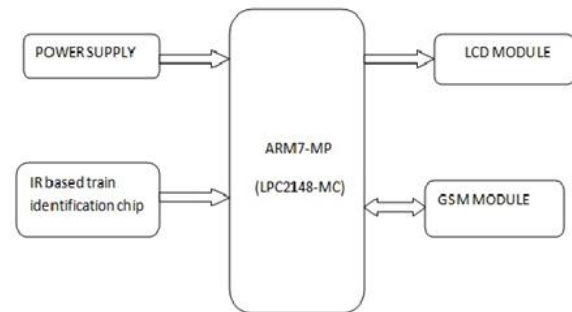
In the existing method the train arrival detection can be done by the wired network the wired network will be connected to nearest control station, but this process not able to drive the correct data sometimes if the wired network fails than we are not able to get the train arrival detection even if the train arrival happens and by using wired network notable cover the more distance. Train detection information can be passed to control station with the help of fixed cable network the fault in the long length fixed cable is very difficult to find and it is time taking process

3. Proposed Method

The Train Collision Avoidance system can be achieved by the using high end micro processor and with the GSM network the embedded device is consisting of train detection sensor unit which the internal ADC data can be used to detect the train arrival. Over unit able to send the train arrival detection information the remote located controlling station will receive the information in the form of SMS. The ARM

MICROPROCESSOR is having a faster execution rate and greater stability with low power operating and the over GSM module is also able to provide SMS message service with the GSM network.

BLOCK DIAGRAM OF THE PROJECT:



Block diagram of the project components:

The LPC2148 microcontrollers is based on a 32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine microcontrollers with embedded high-speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30 % with minimal performance penalty.

Global system for mobile communications is the most popular standard for mobile phones in the world. GSM consider as second generation (2G) mobile phone system which is advanced as compared to 1st generation analog system in signaling and speech channels which are digital call quality. GSM also pioneered a low-cost alternative to voice calls, the SMS - Short message service. GSM is a cellular network. Cell size may be macro, micro, pico and umbrella cells. The coverage area of each cell varies according to the implementation environment. The maximum data rate supported by a GSM system is 9.6 kbps.

A proximity sensor often emits an electromagnetic field or a beam of electromagnetic radiation (infrared, for instance), and looks for changes in the field or return signal. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors. For example, a capacitive or photoelectric sensor might be suitable for a plastic target; an inductive proximity sensor always

requires a metal target. The maximum distance that this sensor can detect is defined. Some sensors have adjustments of the nominal range or means to report a graduated detection distance. Proximity sensors can have a high reliability and long functional life because of the absence of mechanical parts and lack of physical contact between sensor and the sensed object

ARM7TDMI Features

- 32/16-bit RISC architecture (ARM v4T)
- 32-bit ARM instruction set for maximum performance and flexibility
- 16-bit Thumb instruction set for increased code density
- Unified bus interface, 32-bit data bus carries both instructions and data
- Three-stage pipeline
- 32-bit ALU
- Three stage pipe line and faster execution rate.

4. Conclusion

In this paper we are using LPC2148 is main controller. The GSM is connected to this processor. We have to register in this paper t by sending our number. Two IR sensors are connecting to processor to check tracks and UV sensors also connect to this to check objects in the track. If any sensor get activated SMS will send to the registered number and display on the

LCD display. The train will stop automatically. Here the DC motor acts as a train. The screen of sms is shown. We have to register by sending our number. Phone number Then we will get message to your registered mobile number. If there is any problem in the track or any object appears on the track we will get message to your registered mobile and displays on the screen

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