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Design of Wireless Black Box for Accidental Monitoring of Vehicles Using MEMS Accelerometer and GPS Tracking and GSM

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ABSTRACT:

A flight data recorder (FDR) (also ADR, for accident data recorder) is an electronic device employed to record any instructions sent to any electronic systems on an aircraft. It is a device used to record specific aircraft performance parameters. Another kind of flight recorder is the cockpit voice recorder (CVR), which records conversation in the cockpit, radio communications between the cockpit crew and others (including conversation with air traffic control personnel), as well as ambient sounds. In some cases, both functions have been combined into a single unit. Popularly referred to as a "BLACK BOX", the data recorded by the FDR is used for accident investigation, as well as for analyzing air safety issues, material degradation and engine performance. Due to their importance in investigating Contrary to the "black box" reference, the exterior of the FDR is coated with heat-resistant bright Red paint for high visibility in wreckage, and the unit is usually mounted in the aircraft's tail section, where it is more likely to survive a severe crash. An accelerometer (MEMS) can be used in an alarm application in which predict before the crash. It can be used as a crash recorder of the flight movements before, during and after a crash. With signals from an accelerometer, a severe accident can be recognized and recorded. Here we are using a controller as heart of the entire system which will make the recorder to get activated when some disturbance is found by MEMS sensor. We are also using GPS module to get the position. GSM is used to get sms to mobile number with location

Literature survey

Wireless black box using MEMS accelerometer and GPS tracking system is developed for accidental monitoring. The system consists of cooperative components of an accelerometer, microcontroller unit, GPS device and GSM module. In the event of accident, this wireless device will send mobile phone short massage indicating the position of vehicle by GPS system to family member, emergency medical service (EMS) and nearest hospital. The threshold algorithm and speed of motorcycle are used to determine fall or accident in real-time. The system is compact and easy to install under rider seat. The system has been tested in real world applications using bicycles. The test results show that it can detect linear fall, non-linear fall and normal ride with high accuracy.

Drawback: There is no receiver to get proper location

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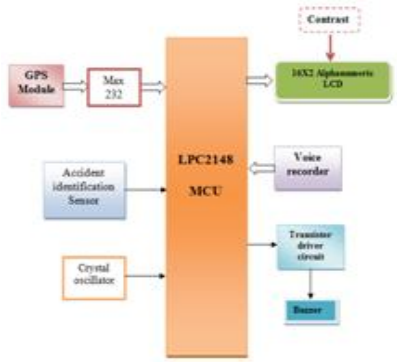
Proposed system

A flight data recorder (FDR) (also ADR, for accident data recorder) is an electronic device employed to record any instructions sent to any electronic systems on an aircraft. It is a device used to record specific aircraft performance parameters. Another kind of flight recorder is the cockpit voice recorder (CVR), which records conversation in the cockpit, radio communications between the cockpit crew and others (including conversation with air traffic control personnel), as well as ambient sounds. In some cases, both functions have been combined into a single unit. Popularly referred to as a "**BLACK BOX**", the data recorded by the FDR is used for accident investigation, as well as for analyzing air safety issues, material degradation and engine performance. Due to their importance in investigating Contrary to the "black box" reference, the exterior of the FDR is coated with heat-resistant bright Red paint for high visibility in wreckage, and the unit is usually mounted in the aircraft's tail section, where it is more likely to survive a severe crash. An accelerometer (MEMS) can be used in an alarm application in which predict before the crash. It can be used as a crash recorder of the flight movements before, during and after a crash. With signals from an accelerometer, a severe accident can be recognized and recorded. Here we are using a controller as heart of the entire system which will make the recorder to get activated when some disturbance is found by MEMS sensor. We are also using GPS module to get the position. GSM is used to get sms to mobile number with location

Block Diagram

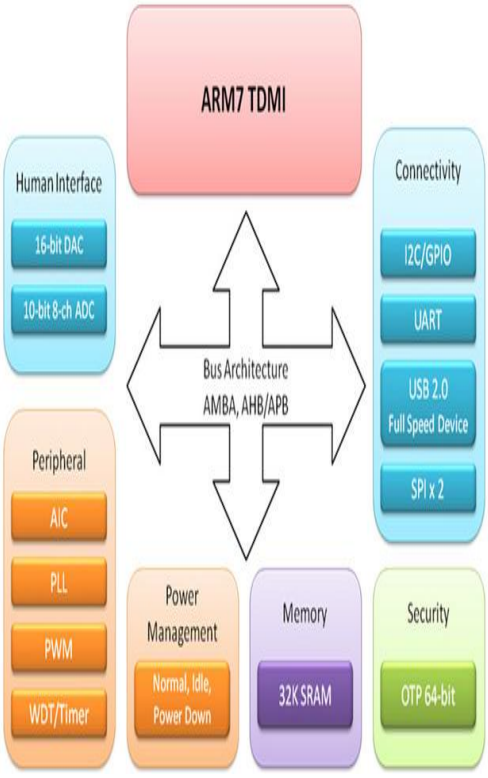


Hardware modules

LPC2148 controller

The **LPC2148** are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory.

A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.



Architecture

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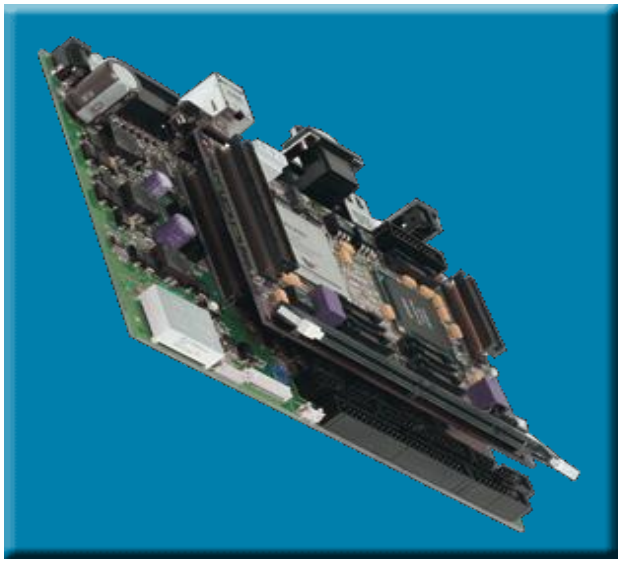
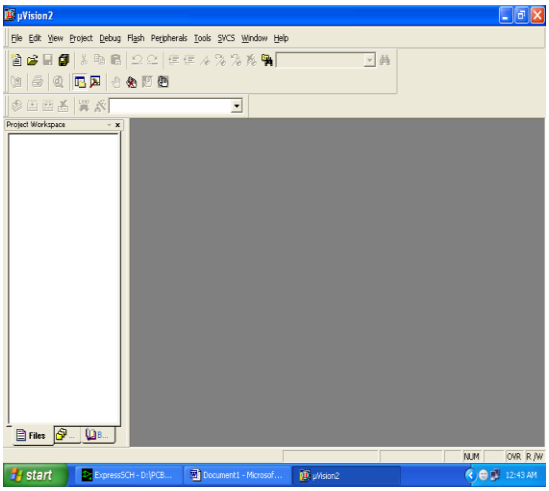
ARM PROCESSOR:



ARM7 board

- Integrated 10-bit ADC
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLL, regulators, and power Software tools
- Embedded C code is compiled in the Keiluvision tool



ADVANTAGES:

- Fit and Forget system
- Low cost and reliable circuit
- Accurate output.

APPLICATIONS:

- Apartments
- Offices, industries ,Shopping malls

CONCLUSION:

This project presents a infrastructure monitoring device. This project is designed and implemented with ARM7 in the stream of embedded systems. Experimental work has been carried out carefully. The proposed method is verified to be highly beneficial in all places.

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