



– A Short Note

CRASH DATA RECORDERS FOR VEHICLES

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ABSTRACT

With increasing traffic on the roads and the introduction of unmanned cars the need for event and crash recorders is essential. The recorders are essential for verifying the events before and during a crash. This is needed for identifying the reasons for a crash. With the road network fast increasing it is not possible to set up surveillance cameras and to rely wholly upon them. A system is also needed to inform the relevant authorities in case of accidents

Key words: Crash recorder, Event recorder, CAN, MEMS, Sensors.

INTRODUCTION

Modern vehicles are equipped with automated systems and vehicular networks. The information available in the systems can be recorded for future use. With more traffic building up and unmanned vehicles, the need for event/crash recorders is essential for establishing the chain of events in case of accidents. The recorder should also be able to communicate to relevant authorities. It should be able to record audio, video and different sensor measurements. Many such systems are available in the literature like the System on Chip design of Embedded Controller for Car Black Box¹, Car Black Box Based on Embedded System², Black Boxes Get Green Light³, Vehicle Black Box System⁴, and Black Box for Surface Vehicles⁵.

System blocks

The proposed system consists of a microcontroller, memory card, digital camers, MEMS magnetometer, MEMS accelerometer, Microphone, Brake sensor, steering wheel

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sensor and GPS. The ARM Cortex-M3 processor, a 32-bit processor is used. The LIS3LV02DQ, a three axis digital output linear accelerometer is used. It consists of a sensing element and an interface to sense and provide signals to the external. In addition UART, serial peripheral interfaces are also used. The CAN bus is used to collect the data from all sensors. Sensors like pressure sensor, temperature sensor can also be included for more data collection.

Functions

The functions of the systems involve real time data collection including visual data, driving data, collision data and positioning data, report generation and communication. Visual data refers to the data provided by video or still cameras installed on all the sides of the vehicle. A single camera can also be installed on the top of the vehicle with 360 degrees view. The driving data like speed, acceleration, brake status, steering status are to be recorded. The data thus recorded can be consolidated as a report or can be sent as such through wireless communication.

Working

In the event of a crash the vibration levels which are sensed by an accelerometer exceeds a predefined level. In such case, the data collected from various sensors are stored in a card. The details can then be downloaded or transmitted immediately using wireless communication.

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