A RELIABLE MESSAGE TRANSMITTING OF CAN-BUS NETWORK CONNECTION APPLIED IN REAL-TIME CAR-BASED MOTOR CONTROL SYSTEM

Chun-Shian Tsai, Kun-Shien Tsai and Ming-Tsai Hsu

Received May 13, 2013; Revised March 19, 2013

Abstract

Today’s automobile is featuring a large number of Electronic Control Units (ECUs). This will increase the system complexity, which will consequently increase the difficulties of programming design and safety and the software cost. Therefore, it is important to provide a reliable, real-time, effective and eventually a low-cost software development tool in the automotive industrial market. ERIKA Enterprise provides an open source for multi-processor real-time operating system kernel, implementing a collection of application programming interfaces similar to those of OSEK/VDX standard for automotive embedded controllers. In this paper, besides the research of CAR-based motor control for message transmitting via the CAN bus network connection, we also research the automotive software framework for ERIKA Enterprise, and through the conducting of ERIKA software, the real time operating system for OSEK can be ported (embedded) into target ECU hardware in a very easy way. Finally, we propose a demonstrative application for enhanced CAN (ECAN) bus network connection to show how real-time transmission of data frames through ECAN bus network connection is guaranteed by ERIKA Enterprise. In the other words, the motor control for CAR can also be managed by ERIKA to keep the data transmitting in a more real time and reliability.

Keywords and phrases: automobiles, real-time operating system (RTOS), OSEK/VDX, embedded system, CAN (controller area network), motor control.