

Abstract: Development of Inter-conversion System and Algorithm for OBD-II compliant protocols over K-Line and CAN buses

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Abstract

Today, each commercial vehicle model of various car manufacturers has heterogeneous diagnostics protocols to support many types of electronic control units over K-Line and CAN buses. The diversity of diagnostic technologies has increased continuously owing to the requirements of new definition specifies for each vehicle model. As a consequence, by increasing the complexity of diagnostics while decreasing the reusability of the existing diagnosis-related codes, development time and costs have increased. To reduce the aforementioned complexity and improve the reusability of diagnostic software, we focused on two kinds of heterogeneous onboard diagnostic protocols that are already widely applied to commercial vehicles in Asia: the K-line bus based ISO 14230 and CAN bus based ISO 15765 protocols. We propose a flexible software architecture for integrating multiple diagnostic protocols between ISO 15765 and ISO 14230, as well as Ethernet networks, and designed algorithms for lightweight inter-conversion in an embedded environment. Finally, we verified the proposed software in simple test-bed which consisted of an electronic control unit and external diagnostic device that is used by a real commercial vehicle.

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