
Implementation of FlexRay CC and BG protocols with application to a robot system

Yi-Nan Xu*, Yong-Eun Kim, Kyung-Ju Cho
and Jin-Gyun Chung

Division of Electronics & Information Engineering,
Chonbuk National University,
Jeonju 561-756, Korea
E-mail: hein@chonbuk.ac.kr
E-mail: dosto@chonbuk.ac.kr
E-mail: kjcho@chonbuk.ac.kr
E-mail: jgchung@chonbuk.ac.kr
*Corresponding author

Xinming Huang

Department of Electrical & Computer Engineering,
Worcester Polytechnic Institute,
Worcester, MA, USA
E-mail: xhuang@ece.wpi.edu

Abstract: FlexRay is a new standard for network communication systems, which has been developed for future automotive applications. FlexRay communication controller (CC) is the core of the FlexRay protocol specification. Bus guardian (BG) is an optional electronic component. In this paper, we first design the FlexRay CC and BG protocol specifications and function modules using specification and description language (SDL). Then, the system is implemented using Verilog HDL based on the SDL source. The FlexRay design is synthesised using Samsung 0.35 μm technology and the operating frequency is above 76 MHz. To validate our designed FlexRay system, it is combined with sound source localisation system in robotics applications. The integrated system is implemented using ALTERA Excalibur ARM EPXA4F672C3. The system operates successfully as demonstrated in experimentation.

Keywords: FlexRay; specification and description language; SDL; Verilog HDL.

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Biographical notes: Yi-Nan Xu received his MS in Physics Technology from Chonbuk National University, Jeonju, Korea in 2003 and his PhD in Information and Communication Engineering from Chonbuk National University in 2009. His research interests are in the CAN, FlexRay for in-vehicle networks and real-time system design, timed and probabilistic modelling of distributed systems.