

# 一种面向船联网的“北斗”异步 FIFO 多通道模型

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**摘 要:** 北斗卫星通信已成为我国近海船联网通信系统中主要通信方式之一, 许多情况它是车载信息设备的唯一外部通信接口. 为解决多路信息设备与北斗终端信息交互过程中, 无法有效实现数据分配与记忆应答等问题, 提出高速异步 FIFO 多通道通信模型, 基于现场可编程门阵列 (FPGA) 设计验证所提模型, 经验证及仿真测试表明此通信模型系统性能稳定、可靠且移植性强. 基于标志移位码的高速异步 FIFO 多通道通信模型实际应用于基于北斗卫星通信的船联网系统, 有效解决车载信息设备通过北斗终端实现交互通信的问题.

**关键词:** 北斗通信; 船联网; 多通道; 异步 FIFO; 数据分配; 现场可编程门阵列

## An Asynchronous FIFO Multi-channel Model

### with Beidou for Internet of Ships

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**Abstract:** Beidou satellite navigation system has become the main communication system for internet of ships and usually as the only external communication interface in many cases. In this paper, an asynchronous FIFO multi-channel communication model based on shift code with flag was proposed to solve the problems that the multi-channel data assignments and proper message response when there are multiple access devices inquiry information with Beidou terminal. Furthermore, based on proposed model, the communication model has been implemented on a FPGA chip. The simulation results show that the performance of proposed model is both stable and reliable. The asynchronous FIFO multi-channel communication system model has been applied to internet of ships based on the Beidou, and the result proves that it makes a ship to shore communication between on-ship devices and remote shore-based devices effectively.

**Key words:** beidou communication; internet of ship; multi-channel; asynchronous FIFO; data assignment; field programmable gate array

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