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多通道串行通信设备的Linux驱动程序实现

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摘要 以自行开发的PCI接口通信卡为例，简要介绍了PCI总线在光电测量数据通信系统中的应用，重点讨论了Linux设备驱动程序开发方法及虚拟文件层机制等相关概念。针对该通信设备，介绍其在Linux下采用内核模块编程方式，实现中断和DMA方式数据传送的方法。实验测得此传输方案的本地速率可达24.096 Mb/s，传输和响应速度较传统读写方式有了显著提高，数据可稳定传输在460 kb/s，满足系统传输需求。

关键词 计算机应用；设备驱动；直接内存访问(DMA)；PCI总线；内核

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Implementation of drivers for multi channel data communication devices in Linux operating system

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Abstract The application of PCI bus in opto electronics measurement device was introduced based on a self developed PCI communication card. The approaches of developing device drives in Linux system and related concepts, such as Virtual File System (VFS) mechanism were discussed. For this communication card, the kernel module programming method in Linux, the interruption of implementation and the Direct Memory Access (DMA) were illustrated. Experimental results show that, with this scheme, the local rate can reach 24.096 Mb/s. Comparing with conventional method the transmission and real time response speed are significantly improved. Data can be steadily transmitted at 460 kb/s which meets the system requirement.

Key words computer application device driver direct memory access (DMA) PCI bus kernel

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