

基于ARM和DSP的可重构数控系统

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摘要 针对柔性化制造的要求, 构建了以ARM、DSP为基础的数控系统平台。该平台集成度高、稳定性强, 能实现生产过程的高速度、高精度要求; 同时巧妙利用SRAM解决了现场可编程门阵列(FPGA)动态重构中的重建时隙问题, 实现了基于FOGA的可重构设计, 提高了系统的柔性。在硬件基础上引入嵌入式实时操作系统RT-Linux, 采用层次化软件设计, 提高了数控系统运行的稳定性和任务调度的实时性。试验结果证明该方案是可行的。

关键词 [机床](#) [数控系统](#) [可重构](#) [ARM; DSP; 实时操作系统](#) [现场可编程门阵列; SRAM](#)

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Reconfigurable CNC system based on ARM and DSP

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Abstract A hardware development platform for the computer numerical control(CNC) system was built based on the ARM and the DSP. It is characterized by the high integrity and robust stability, meets the requirements of the production process on high speed and high precision. The reconstruction time gap problem in the dynamic reconstruction of the FPGA was solved by using the SRAM and the reconstructable design based on the FPGA was realized to enhance the flexibility of the system. The introduction of the embedded real time operation system RT-Linux and the layered software design enhances the operation stability of the CNC system and the real timeness of the task dispatching. The practical application of the developed CNC system in the CNC machine tool proved the feasibility of the system.

Key words [machine tool](#) [computer numerical control\(CNC\) system](#) [reconfigurable](#) [ARM](#) [DSP](#) [real-time operation system](#) [field programmable gate array\(FPGA\)](#) [SRAM](#)

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