

电力系统

一种大功率电力电子设备的数据采集系统

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摘要:

本文研制了一种应用于大功率电力电子设备的数据采集系统。该系统由测量元件、同步单元、采集单元和后处理单元等四部分组成。其中, 测量元件是与一次回路直接连接的高电压设备, 用于将一次回路的高电压、大电流按比例变送为小模拟信号; 根据不同需求, 测量元件的设计和安装可分为接地支路的电压测量、不接地支路的电压测量、接地支路的电流测量和不接地支路的电流测量四种情况分别加以解决。同步、采集和后处理单元是微电子电路, 主要部件位于地电位, 用于完成模数转换、数据传输、滤波、消偏置等多项信号处理, 通过合理设计各单元的内部结构和接口形式, 即可使各单元按特定的时序协同工作。本系统已经成功应用于实际工程, 运行结果验证了系统的测量精度和可靠性。

关键词: 数据采集 电力电子 信号处理 模数转换

A Data Acquisition System for High-Power Power Electronic Equipments

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Abstract:

This paper designs a sampling system that used in power electronic equipment of high power. This system consists of four parts, including measuring components, synchronization unit, sampling unit and post-processing unit etc. The measuring unit is the high voltage equipments which connect to the primary circuit directly. It is used in converting the high voltage and large current to small analogue signal; According to the different demands, the design and installation methods of measuring unit can be classified into four situations: the voltage measurements of Grounding branch and Non-grounding branch, the current measurements of Grounding branch and Non-grounding branch. The synchronization unit, sampling unit and post-processing unit is the microelectronic circuits that used in processing A/D conversion、data transmission, filter and depolarization, etc. By using reasonable design of inner structure and interface form, every unit can work together cooperatively according to special time sequence. This system has been applied in real project, the operation results verified the measuring accuracy and reliability of the system.

Keywords: data acquisition power electronics signal processing A/D conversion

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