DIGITALLY CONTROLLED MAGNET POWER SUPPLY

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Abstract

This paper presents an implementation of a precision magnet power supply (MPS) for the Pohang Light Source using the digitally controlled pulse width modulation method. The output current of the power supply was ±20 A at the precision of less than 10 ppm. The digital control circuit of the power supply was implemented using the 16-bit ADCs , the TMS320F2808 digital signal processor and the FPGA Spartan3. It has full bridge topology and optimized output filters. The duty ratio for output control was determined using the simple PI method. The one of the Ethernet (including EPICS), CAN or RS232C communication was possible. The various experimental results, such as stability, drift, and controllability, are given to verify the characteristics of the DSP based magnet power supply.

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Hardware Technology