

Design and Implementation of the SNS Wire Scanner Electronics

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Abstract

This paper describes the design and implementation of the wire scanner electronics to be used in the SNS facility. Each wire-scanner system is personal-computer based and consists of commercial 5-Msa/sec 12-bit digitizers, a stepper-motor controller, a stepper-motor power driver and software. An additional 1U-high chassis contains custom preamplifier electronics and high-voltage bias power supplies. Each system can measure the current on any of three wires per actuator as it accurately steps it through the beam. Each wire can have a computer-controlled negative bias up to -100 Vdc, and each electronics channel is AC coupled to the wire. Measurable wire current ranges from about 15 nA to 2.5 mA with positional accuracies of less than one mill. Each wire channel is bandwidth limited to 45 kHz and has selectable gain stages, which are computer controlled in about 15 dB increments.