USB Control of Multiplexed Shaper Electronic for a Segmented Silicon Array[1] M. HODEK[2], C.J. METELKO, R.T. DESOUZA, IUCF, A. ALEXANDER, Dept. of Chemistry, Indiana University — We report on an electronic system, MASE (Multiplexed Analog Shaped Electronics), designed to simplify the analog processing and readout from a highly segmented silicon detector array. This system focuses on providing good energy resolution and adequate timing information for up to 1024 channels. It consists of 16-channel boards which can be either used independently or as part of a larger system. The analog portion of each channel has low and high gain shapers with associated leading edge discriminators and peak hold circuits. The logic for readout of the analog signals is performed by two FPGA chips located on each board. Readout of MASE channels is multiplexed, an approach that works well for a broad range of experiments. To aid in the debugging and monitoring of an experiment, signals are also multiplexed for inspection purposes. The gain of each shaper and the threshold of each discriminator is adjustable through DACs. Shaper and discriminator control parameters are transferred through a USB port to an onboard FIFO chip. This chip transfers the commands to the FPGAs, which control the shaper/discriminator circuits and the acquisition sequence. A Tcl/Tk graphical user interface coupled to a C++ source code allows the user to easily provide the control parameters to the MASE electronics.

[2]home institution: Bowling Green State University

Romualdo deSouza
Indiana University/IUCF

Date submitted: 05 Jul 2005   Electronic form version 1.4