Fermilab

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SWIC and Multiwire Timing

Jim Crisp, Gianni Tassotto

The new SWIC scanners, designed by the Controls group, have internal TCLK decoder hardware. Three separate events are decoded to create "Start", "Sample", and "Stop" times, see figure 1. The scanner has buffers which allow it to process more than one sample. Successive samples which occur between the "Start" and "Stop" events are placed in buffers specified by consecutive lines in the "Sequence" window. The "Type" field in the "Sequence" window refers to the line number in the "Configuration" window. Thus, data taken on successive samples can have different "Configurations" and be placed in desired buffers.

Applications page I41 supports only one sample using the "Display" buffer but does allow 2 lines in both the "Sequence" and "Configuration" windows.

The "Type" field in the "Configuration" window can be set to "Slow", "Fast", "Cali", "None", and "Zero". Selecting "Cali", or calibrate, connects a constant signal to the input and results in a flat profile whose amplitude depends on "Gain" and "Duration". There is no hardware difference between the other choices but "Slow" is typically used to measure beam profiles.

The scanner begins integrating 5.1 msec after the "Sample" event and continues for the time specified by "Duration". An additional 2.1 msec is required to read the results prior to the "Stop" event.

The "Stop" event should occur more than 5.1 msec + "Duration" + 2.1 msec after the "Sample" event. If the "Stop" event occurs too early, an "End of Sequence" error message is displayed.

There are 10 new scanners installed, the last 5 multiwires in the MI8 line, 4 in the MI ring, and 1 in the MI abort. Sixteen more are planned for the A1, P1, and P2 beamlines.

Timing for the abort SWIC has been problematic and requires special attention. The "Stop" event can be set to FE, the no-op event that never gets generated. After the "Start" event is received, data will be returned after each "Sample" event is processed. As mentioned, successive samples after the "Start" event will use succeeding lines in the "Sequence" table. Sample events occurring while a prior

sample is processing are ignored. Scanners other than the abort SWIC should use 26 as the "Stop" event.

The profile plots are automatically scaled and the amplitude is displayed below the lower right hand corner in percent of full scale. The gain can be set to 1, 10, or 100 in the "Configuration" window. When a gain of 1 is selected, integration will prematurely stop when any of the channels exceeds the value set in "Thres".

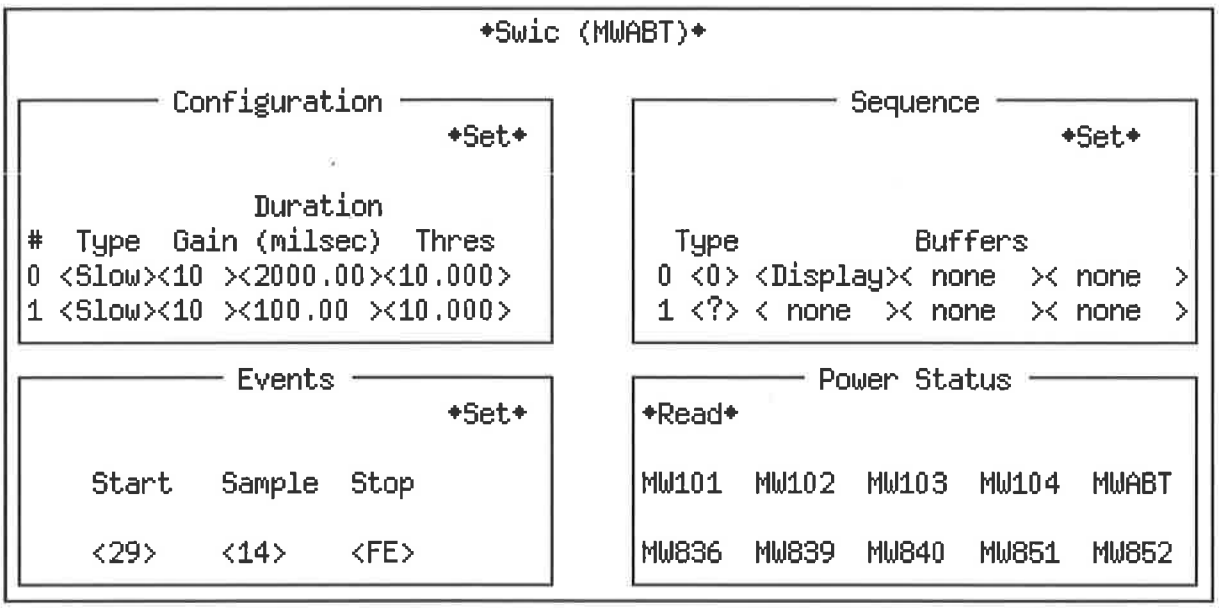

Figure 1. SWIC scanners are controlled through applications page I41. Choose "misc controls" menu, select "MW836-104". Typical abort parameters are shown.