NSCL support of the CAEN V812 Constant Fraction Discriminator

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Abstract

This article is intended to explain the basic NSCL support for the CAEN V812 constant fraction discriminator (CFD). There are multiple levels of support for this unit, including a Tcl library and a graphical user interface (GUI). This paper will explain in detail how to setup the module via the GUI. It will also discuss, to a much less extent how to use the Tcl library.

This paper assumes very little about your previous knowledge of data acquisition electronics, it aims to be easy to use and understand by people with a wide range of experience. Information about some DAQ electronics, including discriminators, is available at http://docs.nscl.msu.edu/daq/samples and may useful if you have no previous experience.

1 A Brief Description of the CAEN V812

The CAEN V812 is a VME based, 16-channel constant fraction discriminator (CFD). The module accepts Lemo inputs between -5mV and -5V. The output is an ECL signal on a 16-pin connector, each connector has output for 8 channels. There are two outputs per channel. The module provides a sum output, which provides a 1mA current for each active channel and a majority input, which will provide a signal when a programmed number of channels are active. This general description of the module should not be taken as complete or as a substitute for reading the manual, which is available as PDF at http://docs.nscl.msu.edu/daq/samples.

2 Tcl Library

Low-level support for the V812 is provided through a Tcl library called CFD812.tcl. The library, written by Ron Fox, defines functions that allow the user to interact with module by calling functions in a Tcl shell. To use the package, open a tcl shell and type "package require CFD812". After the package is loaded commands can be called just like any other package commands. A list of commands is available can be requested via email at daqdocs@nscl.msu.edu.

While it is possible to use the Tcl library to setup the V812, it can become slow and tedious. To solve that problem a GUI has been written to call the same functions without the user having to think about the underlying mechanisms. However the NSCL GUI may not fit the requirements of all groups, the Tcl library is therefore provided as a base, on top of which anyone can place a GUI of their own design.

3 NSCL V812 GUI

The NSCL supported GUI for the V812 provides the user full access of the module in a point and click environment. Figure 1 show is a screenshot of the GUI.

Before using the NSCL supported GUI for the CAEN V812 you will have to define a module. This is done by creating a file with the extension ".cfd". This file sets, at minimum, the modules name, base address, and crate number. An example of this file, named "example0.cfd", could look like:

```
set Name "Random_name"
set ModuleBase 0x10000000
set Crate 0
```

After writing your configuration file, making sure to use the correct base address (instructions on setting the base address are in the CAEN manual), you are ready start the GUI, which must be run from a directory in which you have write permissions. Start the GUI by typing

```
/usr/opt/daq/7.4/contrib/caenv812/cfd.tcl
```

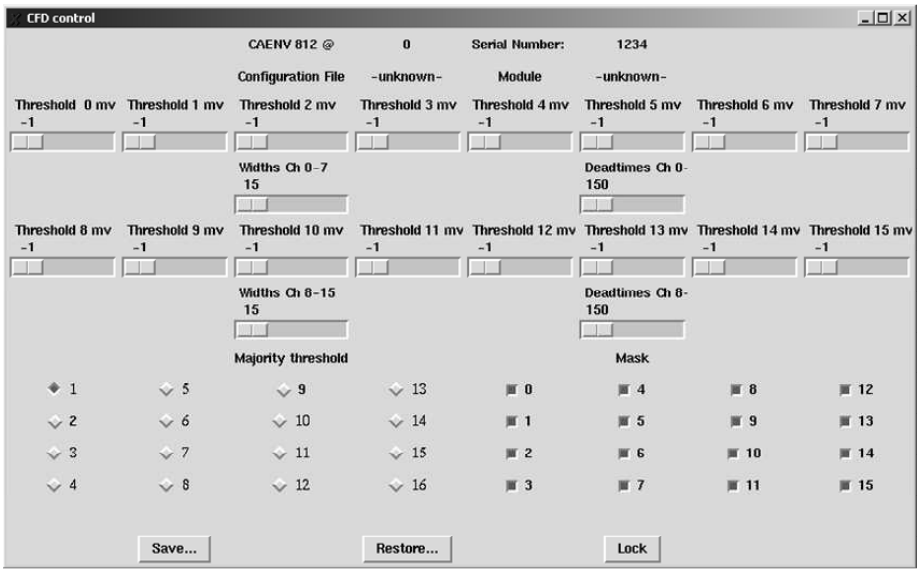

Figure 1: Screen shot of NSCL supported GUI for the CAEN V812

where 7.4 is replaced with the current version of the DAQ software. A dialog box will open on your screen, open the configuration file you just wrote. At this point you can proceed to set the parameters for your V812. All of the parameter options are described in detail in the CAEN manual.

Changes made on the interface are transmitted to the module in real time, making setting thresholds easier. The program automatically creates a file called "failsafe.cfd", this file saves your changes automatically every few seconds in case you forget to do so. Pressing save will bring up a dialog box allowing you to save your configuration file, either as an existing file or under a new name. The restore button loads a previously saved configuration file that you choose. Pressing the lock button makes it impossible to change any values until unlock is pressed.

4 More information

More information is available at: **http://docs.nscl.msu.edu/** and should be your first source for help. If that doesn't help contact daqdocs@nscl.msu.edu

Please help with the accuracy of this paper. If you find any kind of error please report it at **daqdocs@nscl.msu.edu** .