Object Oriented Decoder Re-Write

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Object Oriented Decoder

Goals and what it is

- A rewrite of the existing decoder
- Easier to add new modules (ADC, TDC, scalers, etc)
- Easier to handle event types in user-specified ways
Module Classes

- 1881
- 1875
- Scaler
- Fastbus VME
- FADC F1TDC
- 560
- 1151
- 3800
- 3801
- 1151
- 1877
- 1881
- 1875
- Scaler
- FADC
- F1TDC
- VME
- Fastbus
- Module

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OO Decoder Recent Progress

- Crate Map drives creation of modules
- Fastbus FB decoding works and is certified
- First versions of FADC250 and F1TDC classes exist
- New feature: Detector classes can GetModule

- Event Type Handler prototype code developed
- Hall A ScalerEventHandler, with scaler modules, is working
Examples of Successful Decoding

**R-arm VDC u2 time**

Entries: 1005738
Mean: 1412
RMS: 184

**FASTBUS DATA**

**Rvu2t**

Entries: 1005738
Mean: 1412
RMS: 184

**bcmu1r:evnum**

SCALER DATA
using event handler

**Integral of ADC**

Entries: 10000
Mean: 8.805e+04
RMS: 5875

**FADC**
integration mode

**hinteg**

Entries: 10000
Mean: 8.805e+04
RMS: 5875

**snapshot 4**

**FADC**
sampling mode

**h4**

Entries: 500
Mean: 230.5
RMS: 147.2

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Certification Process, Performance

- Comparing old and new decoder
- All bins of all histograms identical (many checks)
- With “average” output, the new decoder is 16% slower
- To do: investigate if I can speed it up
How to Add a New Type of Module

A module is not a plug-in. But it’s still pretty easy ...

- Write a new class that inherits from VmeModule
- Register the class in Module.C
- Add to (1) Decoder namespace, (2) Makefile, and (3) Dictionary
- Add the line for that crate and slot in crate map (DB file)
- Modules are created dynamically if they appear in the crate map

Note on Fastbus: Warnings issued if module in data but not in crate map, or vice versa.
Proposed Event Handlers

- EPICS
- Ev140 Scaler
- Hall C Scaler
- Event Type Handler
- THaAnalysisObject

Recently written by Bob Michaels on Jan 14, 2015
Scaler Event Handler  THaScalerEvtHandler

- Processes the Hall A Scaler events (evt type 140)
- Contains Scaler modules
- The scaler types and locations driven by a database
- Global variables and how they tie to scalers driven by a database
- Counts or rates available
- Variables appear in Podd output Tree T and fScalerTree
Summary and To-Do List

“Beta” release of OO Decoder is ready

Want to try splitting of multiblocks at DAQ level. (code recently available from Bryan Moffit)

Improve and certify FADC and F1TDC classes

Investigate the speed

Add some modules: CAEN 1190A, etc.

Fini