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Monitoring software for the ECAL OD Electronics and Hardware

Purpose

To have a visual interface that allows rapid identification of abnormal conditions in the ECAL OD Electronics.

To keep up-to-date information concerning the synchronisation of the SLB cards in the trigger system.

To monitor the status of the ECAL TTC system.

To monitor the health of the PCs used in the the ECAL DAQ.

SLB Monitoring

A `Monitor` process collects flashlists whose collection triggers the saving of the SLB histograms directly in the CondDB.

These histograms are produced in the ROOT format by the `SLBMonitoringProducer`.

The GUI then interfaces the CondDB retrieving the latest histograms.

The Software side

The overall idea is to have local processes that gather data from hardware attached to its PC and return it to a global process. This global process provides an image of the whole system and provides a backend to the final piece: a user interface.

Monitorables Collector (MC)

This should be an addon to the Device Supervisors, and use them to access the Monitorables, perhaps using XDAQ monitor application [↗](#).

Monitoring Overseer (MO)

This XDAQApplication runs in a single location and effectively centralises Monitorables asked from the Collectors.

It should read a configuration file specifying how each Monitorable should be handled (periodic collection, on demand, source, etc).

The Overseer will act as an image of the whole system (for the Displayer or other applications to query) and as a cache, so as to avoid that data is polled too often, particularly if it is voluminous.

This way, applications should subscribe to Monitorables from the Overseer. If the Monitorable changes states, then subscribers are notified of changes. The Overseer should also accept requests to force a refresh of a certain Monitorable.

Monitoring Displayer (MD)

This is a GUI that processes and displays the Monitorables.

It should subscribe to Monitorables from the Overseer and, if requested by the user, force their update.

Monitoring Logger (ML)

Another application that subscribes Monitorables from the Overseer and writes them into some database or logging mechanism for a posteriori retrieval.

Available tools

For the Displayer we can use the Physics and Data Quality Monitoring infrastructure [↗](#)

How to get this together with XDAQ?

The Hardware side

Electronics in USC55 level S2, row D:

- ECAL = 4 partitions: E{B,E}{+,-}
- EE{+,-} = 6 VME crates
- EB{+,-} = 12 VME crates
- VME E{B,E} crate = 3 {tri,hex}plets
- 1 {tri,hex}plet = DCC + CCS + {1,4} TCC {68,48} (w/ SLBs)
- 18 Readout PCs

Electronics in USC level S1:

- TTC crate
- TTC PC

Monitorables

These need to be defined per piece of hardware.

- *Context* refers to under which card this monitorable is defined
- *ID* is an unique string defining the name of the monitorable
- *Type* can be used to define how critical this particular Monitorable is in defining the state of its context, so as to prioritize display
- *Frequency* should specify if this Monitorable is to be polled on demand or regularly, and if so at what intervals
- *Size* specifies the amount of data that this Monitorable requires
- *Offset* refers to the location of this Monitorable's information inside the register/memory space of its context.

Context	ID	Type	Frequency	Size	Offset
SLB					
	SyncHistos	check trigger sync	per minute	1 KiB	0xdeadbeef
TCC					

CCS					
DCC					
TTC					
Caen					
DCC-TC					
PC					

|?| | | | | | |

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