ACORDE user guide

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Sections

1. INTRODUCTION

There are three systems running at the ACORDE workplace in the Alice Control Room: Data Acquisition System (DAQ), Detector Control System (DCS) and Monitoring Of Online Data (MOOD).

Here you have a beginners guide to operate ACORDE through these systems. It is by no means a complete description. It has been developed to introduce you, to the basic and common monitoring and setting up of the detector keeping in mind that, once you have your hands on, the actual learning process will begin.

The DCS, DAQ, and AMORE systems that you will learn to use, are the same for all the ALICE sub-detectors. So that, once you learn how to operate a detector, you will know how to operate other detectors. Of course, keep in mind that each sub-detector has its own particular aspects. There is a section called "Daily Calibration" where you will find a procedure to create some calibration data files.

At the end of this manual you will find some Appendix that contains information that may be useful once problems start to appear.

2. Detector Control System

Unlock ACORDE workplace

To unlock ACORDE workplace and start using DCS type the following password in the locker cell: *ACO.275*

Starting DCS

The DCS runs on a Windows Platform running on the PC: *aliacown001*
The machine name stands for: ALIce ACOrde Working Node 001.

Open an xterm window—from   *aldaqacr38*   you need to remote login typing the following command:

> *rdesktop -g 1280x1000 –a 16 –d CERN –u mim aliacown001*

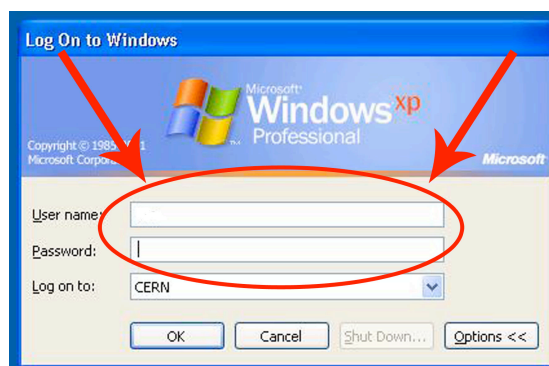The DCS login window will pop up as shown in Fig. 1.

Figure 1 – DCS login window

- Log in with your NICE userid and password.

Once you have been logged in, you will be into a Windows Desktop Environment. In order to access to the ACORDE DCS graphic user interface (GUI) you need to:

- Click on the START button
- Select ACO_DCS

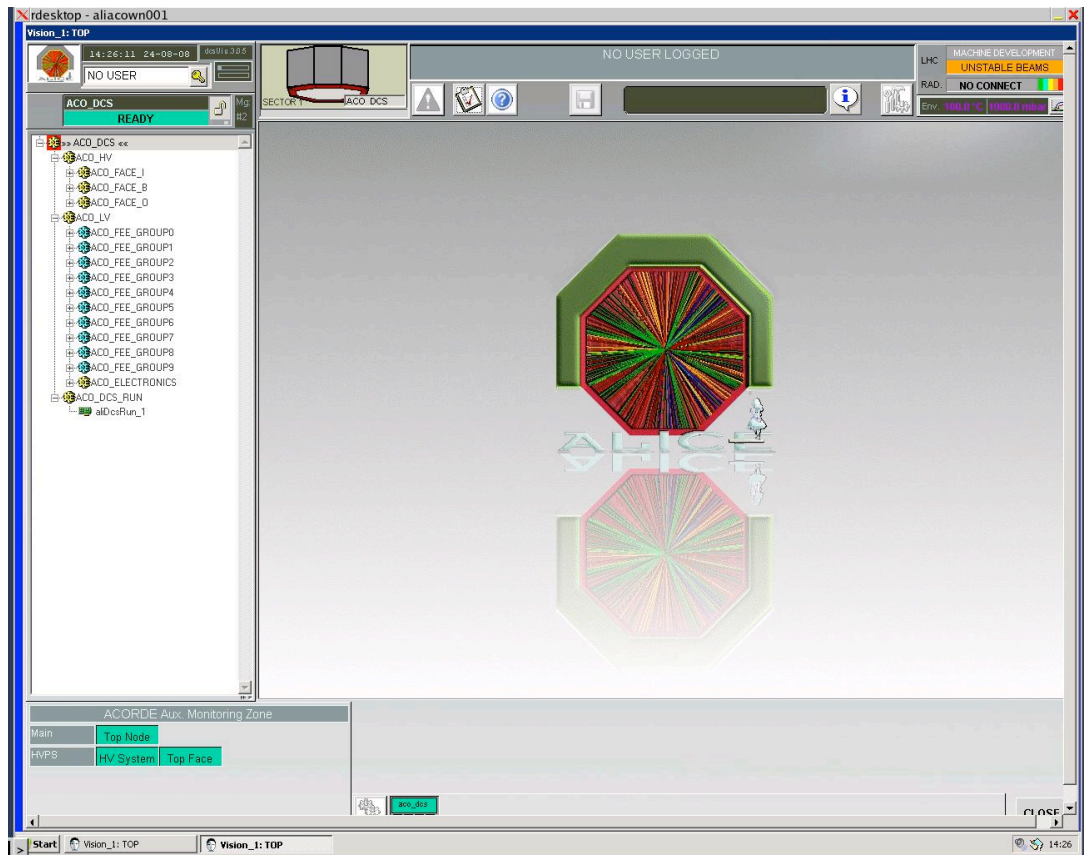Then ACORDE GUI will appear as shown in Fig. 2

Figure 2 – DCS Graphic User Interface

Now you are inside the DCS but you cannot interact with it since you are not logged as a DCS operator.

Generally a window will automatically pop up and ask you to enter your NICE login and password. If it doesn't happen, click on the yellow key on the up-left corner of the screen.

Once you entered in, you are definitely logged into the ACORDE DCS computer as a DSC operator. Fig.2 shows how the screen looks like at this point.

The interface is divided in different frames. On the left side of the screen you can see "FSM Tree Browser" that gives you the possibility to select the module you want to interact with.

The central frame, bigger and collocated on the right side of the screen, will contain the selected panel.

The down-left corner represents the "Monitoring Zone". Here you will find the status of the different part of the detector. Each status corresponds to a specific color. The color meaning will be explained in the following pages.

To have a global view of ACORDE modules status:

- Go on the FSM Tree Browser
- Right click on ACO_DCS (the first row)
- Select -> view panel

On the right side of the screen the top part of the magnet will appear showing the configuration of ACORDE module on it (Fig. 3).
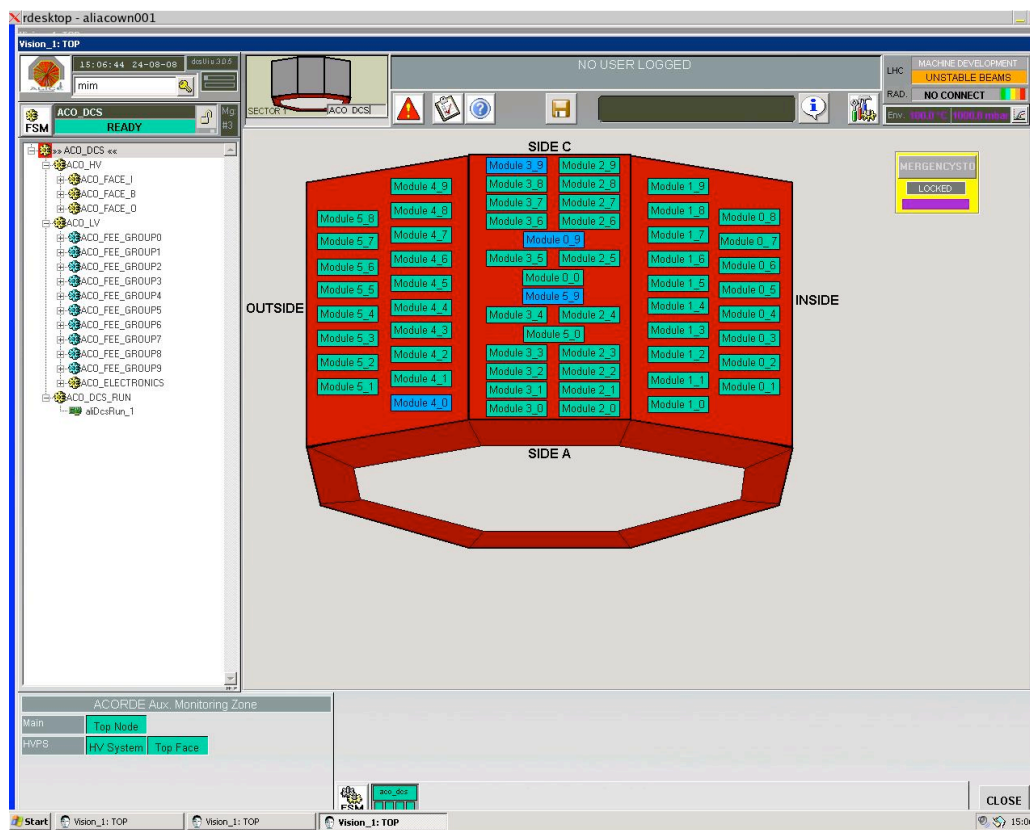

Figure 3 – ACO_DCS panel view

Referring to the Fig.3, the meaning of the labels is: INSIDE to indicate the face looking at the inner side of the LHC ring. OUTER indicates the opposite. Side A is the edge close to the shaft and Side C the opposite.

HV panel monitor

From the "FSM Tree Browser", select ACO_HV. The wheel should have a red background. A monitor panel, showing you all the monitored modules parameters, will appear. For each module it shows: module number, readout voltage and readout current. See Fig. 4.

Figure 4 – ACO_HV monitor view

HV single module panel

Inside the FSM Tree Browser, single modules are divided by the magnet face they have been installed on, FACE_I, FACE_B and FACE_O.

In order to monitor and to control a single module, follow the next steps:

- Expand the "face node" the monitored module is in

- Right click on the module number and select "view panel" to display the monitoring panel.

To take control of the detector, select the top node ACO_DCS. The wheel should have a red background.

The panel shown in Fig. 5 will appear. It contains a graph where the history of voltage changes is displayed, the monitored voltage and current.
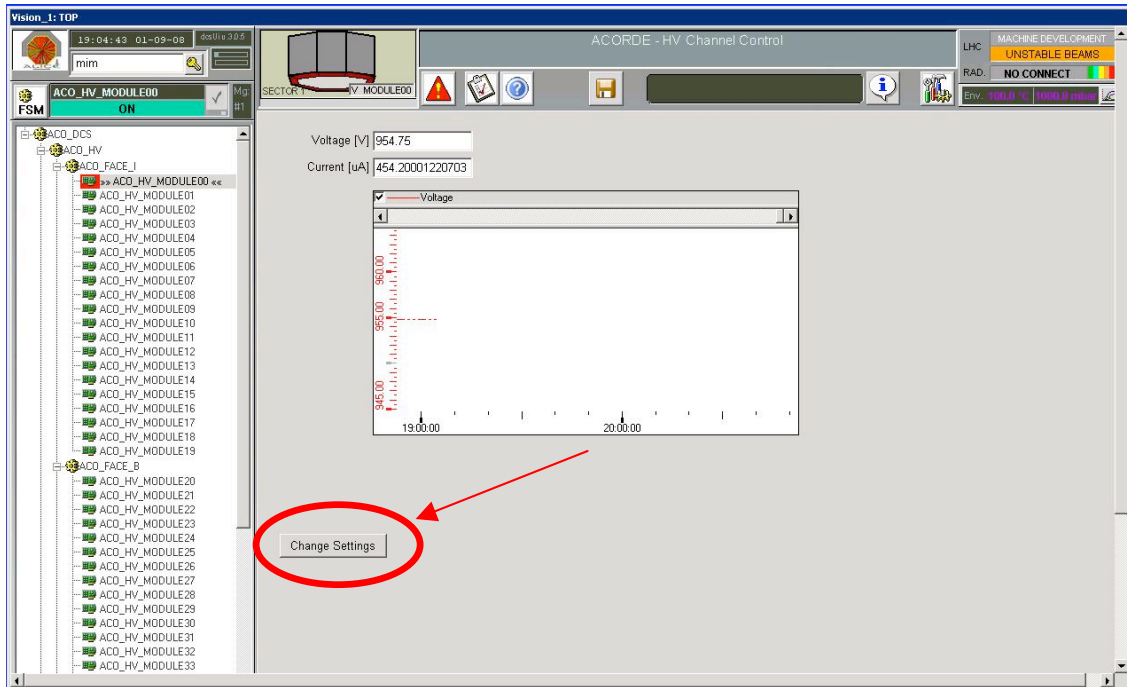

Figure 5 – Single module HV control panel

In order to change the settings (i.e. high voltage) of the selected module:

- Click on "Change Settings" button (see Fig. 5)
- On the HV Channel Operation panel click on *v0 setting cell* (marked in Fig.6)
- Insert the desired voltage
- Click on APPLY and then CLOSE

Generally the DCS update the status of the voltage once every 5 seconds. So you need to wait before be sure that the desired status has been reached.
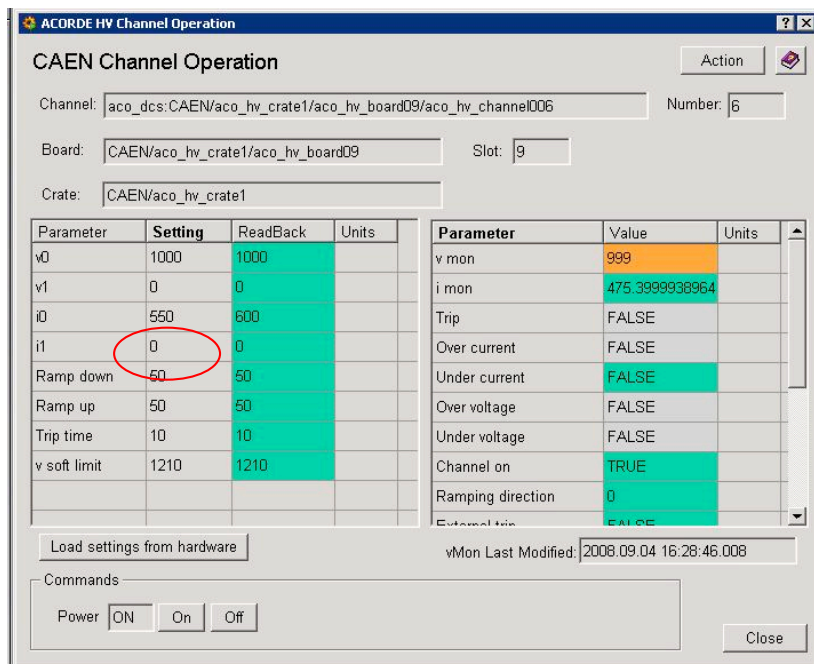
Figure 6 – HV Channel Operation Panel

LV panel monitor

Analogously, to change the voltage of a FEE card, you need to follow the same steps of the HV. LV control panel will appear as shown in Fig.7
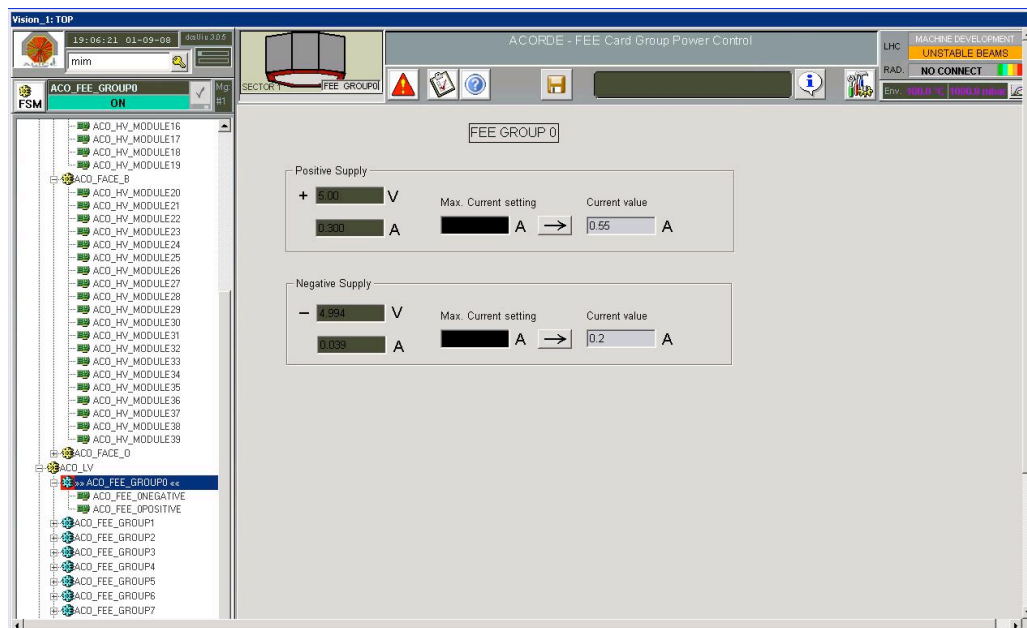

Figure 7 – LV Control Panel

Since the FEE cards voltages are not going to be changed very often, you may not require using these panels.

JCOP Alarm Screen

Clicking on the exclamation mark icon (Fig. 8) collocated on the top-centered frame in the DCS GUI, it is possible to see the history of all the alarms and errors reported from the DCS.

Figure 8 – Top-Centered DCS frame

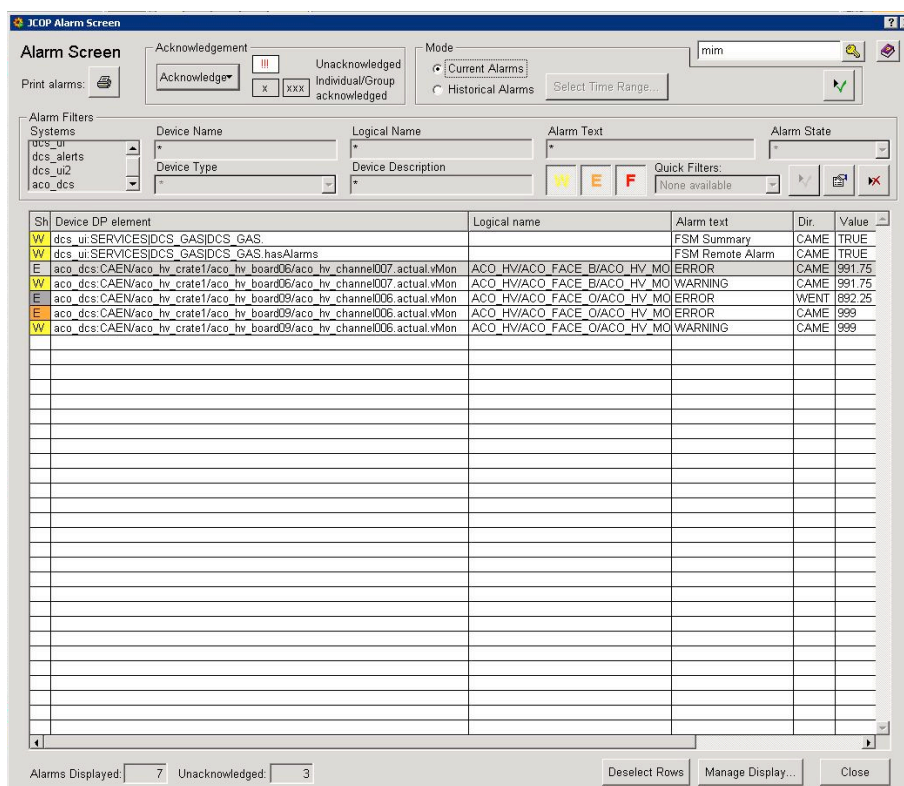An example of ACORDE JCOP Alarm Screen is shown in Fig.9

Figure 9 – JCOP Alarm Screen

The first column contains the *Short Symbol* of the alarm:

- W means WARNING
- E means ERROR

All the most useful information in order to find and solve the problem are shown in the screen grid. If you need to have more details concerning a specific alarm, just select it, right click on it and select *Details.* A window with all possible information concerning the alarm will appear.

3. Data Acquisition

Starting the Detector Control Agent DCA

Note that, to use it, you need to unlock it and take control. The padlock close to ACORDE picture on DCA can assume 3 different states (arrow Fig. 10).

RED: it means that someone (e.g. ALICE control room) took the control and you are not able to do anything

WHITE: it means the no one has go the control of the detector. It is a middle state

GREEN: it means that you have the control of the detector and you can operate on it.

You can swap among the different status by clicking on the padlock icon. To unlock the DAQ panel follow the same procedure.

The Detector Control Agent (DCA) is the application from which we can start standalone runs. In order to start it, you need to log in at terminal *aldaqacr38* .

You will see in the bottom of the screen the "DateHi" icon - undefined picture - , between Mozilla Firefox and the Lock Screen icons. Cliking on it will start the DCA window.
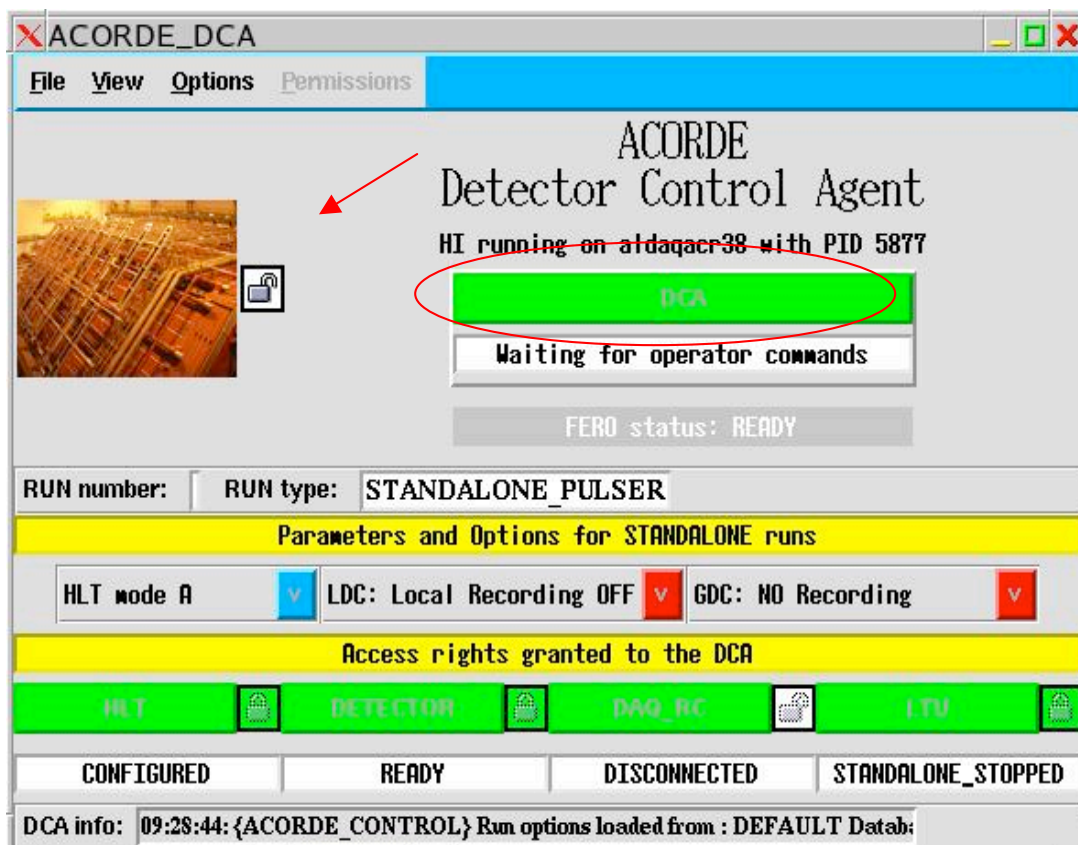
Figure 10 – ACORDE Detector Control Agent

The window in Fig.10 will pop up. The "Info Browser" and the main DAQ Run Control Window will also pop-up.

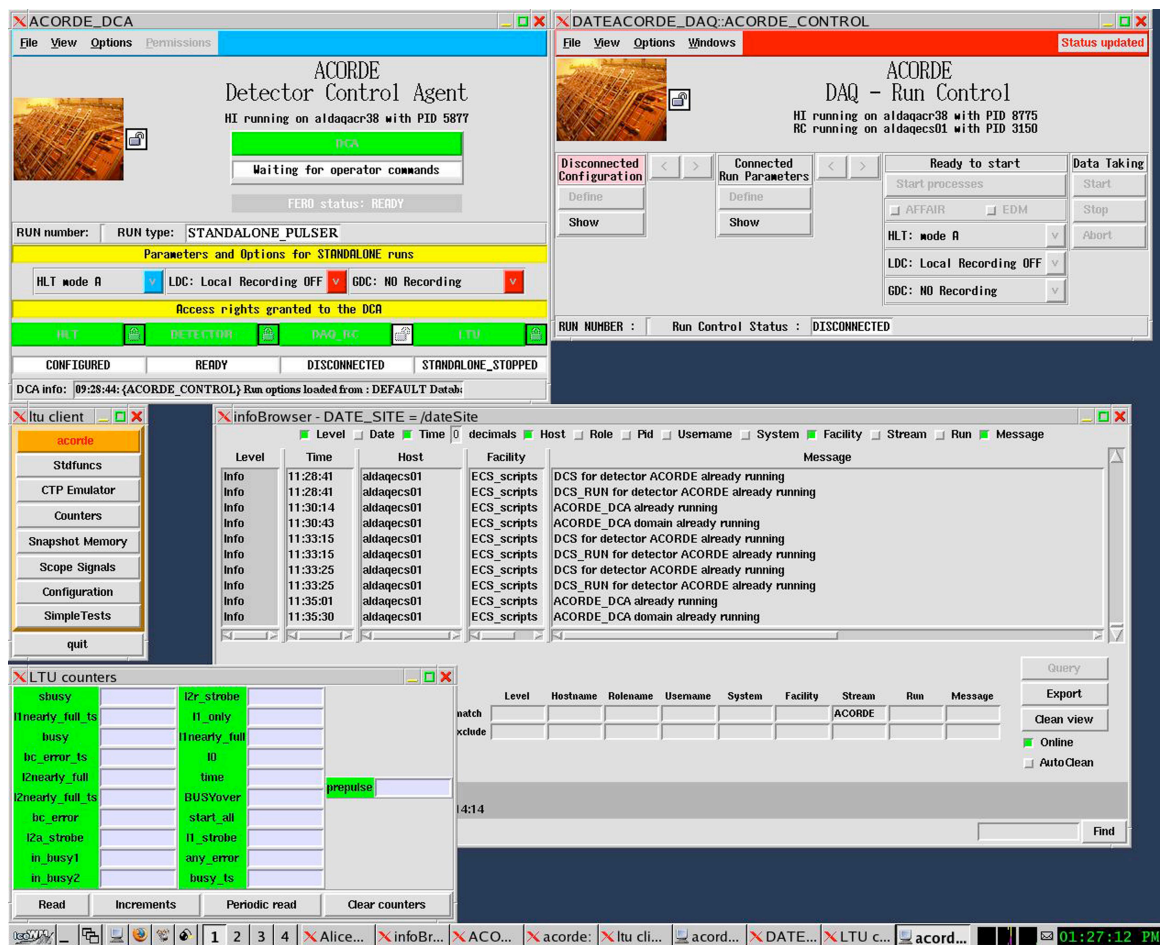The typical screenshot during a standalone run is shown in Fig. 11

Figure 11 – Screenshot during a Standalone Run

Starting a Standalone Run

In order to start to take data in standalone mode, next steps have to be followed:

- Be sure you have the control of the DCA (white or green color)
- Click on the DCA button marked in Fig. 10 and Fig.11.
- Select STANDALONE RUN

Scripts

Another task of DAQ system is to set up the multi-coincidence number, which is the number of hit module that generates a trigger signal. This is the only programmable parameter of ACORDE electronics. Changing the multi-coincidence value is possible using scripts.
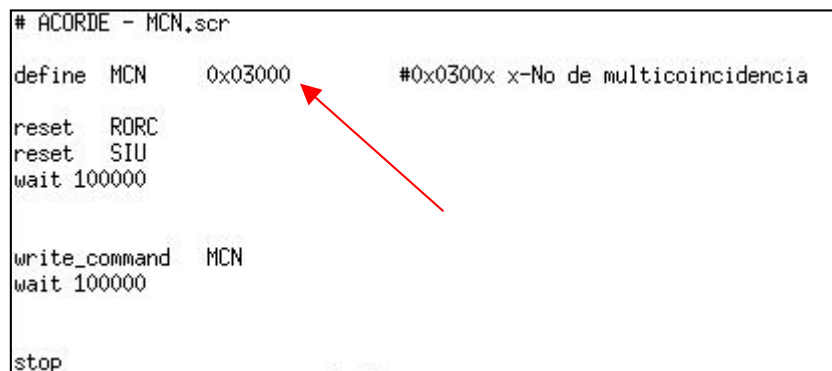
Specifically, the script created for this purpose is: *MCN.src*
It is stored in the following path:

aldaqpc055: ~/CaliMRC

Editing it, it is possible to change the threshold for the multi-event trigger. To edit the script, type:

pico MCN.src

The script content is shown in Fig. 12

Figure 12 – MCN.src script content

Change the hexadecimal number to the desired value.

Data Monitoring with MOOD

Starting the Monitoring Program MOOD

MOOD is the program used to monitor online the data coming from the ACORDE DAQ. It runs on the computer aldaqdqm08".

To start MOOD:

- log in from "aldaqacr38" into "aldaqdqm08" -typing in a xterm:

  ssh –Y acorde@aldaqdqm08

- type: *mood &*   to run the application in the background.

A window will pop up as shown in Fig. X.

- Select the menu   VIEW or DETECTORS → ACORDE   → cosmic2007.

You need to be aware that the graph will appear only after the second counting event, then few seconds are needed before you can see it.

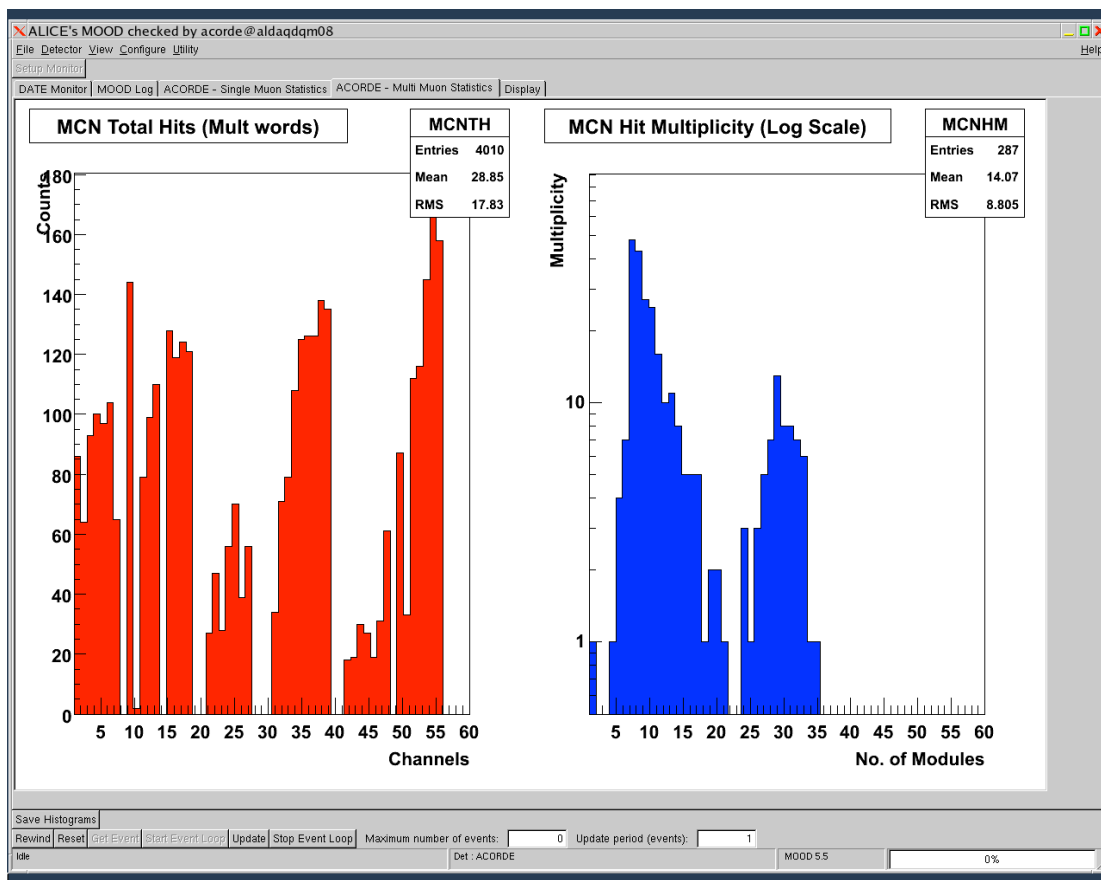The window will now looks like Fig. 13

Figure 13 – MOOD interface and Events Graphs

On the left side you have the collective multi-coincidence hit events plotted for each channel (module). On the right, you have the event multiplicity in function of the number of the hit modules. This is one of the options that you may choose at the top.

In order to analyze these data also in offline mode, the graphs can be stored in CASTOR (Cern Advanced STORage manager) simply selecting the menu FILE → Send data to CASTOR.

4. Data Monitoring with AMORE

AMORE (Automatic MOnitoRing Enviroment of ALICE) reads raw data and display few histograms to check the ACORDE raw data flow. AMORE is composed of two parts: 1) *amoreAgent* that runs in the acorde@aldaqdqm09 and 2) *amore GenericGui* running at aldaqcr46 machine, in workspace 3 which display the QA (Quality Assurance) histograms.

4.1 HOW TO START THE AGENT

The agent is the one that actually runs amore; it is executed in aldaqdqm09 machine. There is a window in workspace 3 or the aldaqcr46 where you can start amore by typing :

acorde@aldaqdm09 > amore -a AmoreAgentACOQA

you should see several messages on the screen, indicating the access to the data stream. AMORE works only when a data taking is going on. If an error message appears on the screen, ask a DAQ expert.

4.2 HOW TO START THE GUI

To start the GUI you must be on aldaqacr46. Open a window, then type:
acorde@aldaqacr46> *amore -d EVE -m GenericGui &*

This will display 2 windows with menu options, on the left select *amoreAgentACOQAshifter* it will show different histograms, choose whatever you want to see. The typical windows looks like the figure shown below
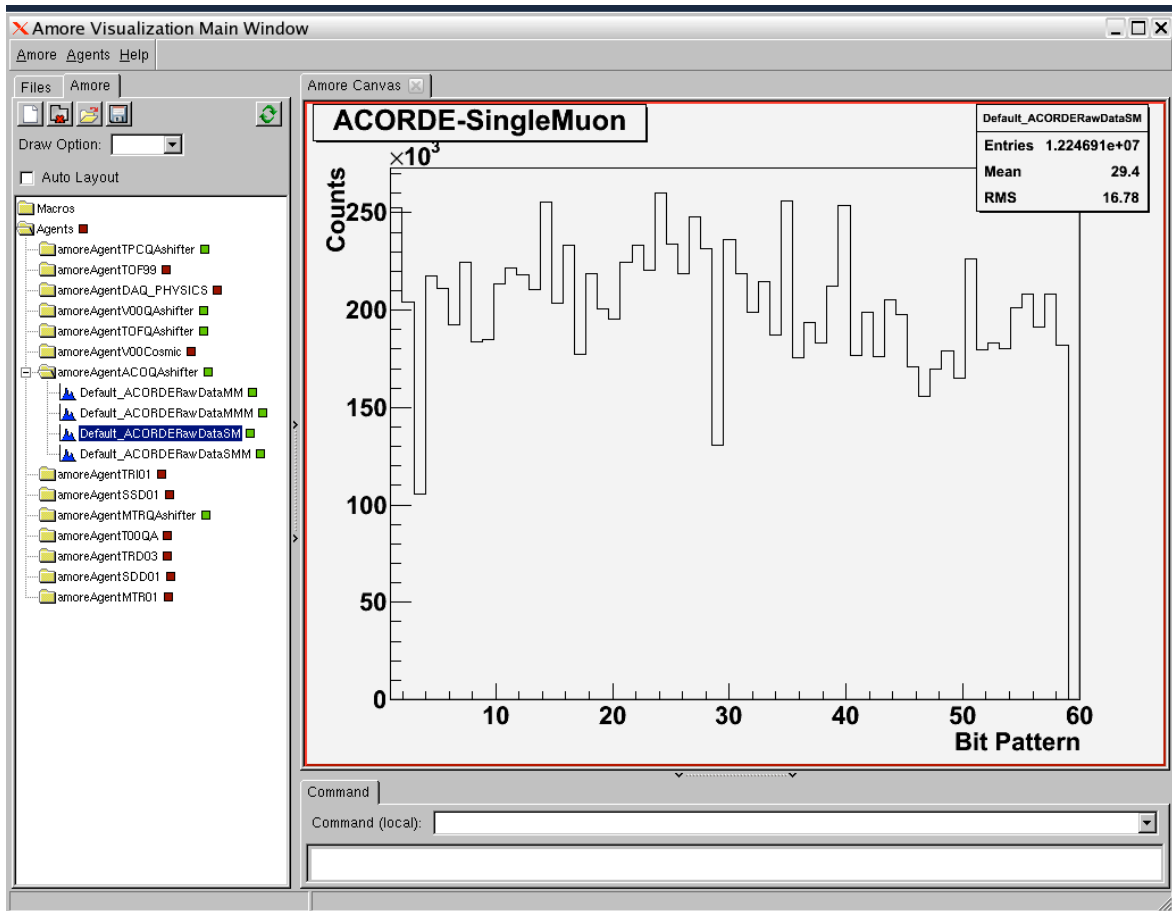
Figure 12. Screenshot of amore, show rates of ACORDE online.

4.3 WHAT SHOULD I CHECK

There are some references plots which you should compare with the one displayed in AMORE (see Fig. 12). If you don't see something similar you should contact an ACORDE expert. For instance, if you see a big peak or an empty bin in the single or multi histograms call immediately to ACORDE on call shifter.

5 ACORDE Daily Calibration

The Happy hour starts usually at 9:00 am, lasting for one hour, approx. Before make any activity, check if a Global Run is underway. If you are not sure about what is happening, ask the shift leader in charge.

During the happy hour you most calibrate the ACORDE detector array. In order to do that you need to do the follow:

1) Starts a ssh session in aldaqpc160 machine, login: acorde, pwd: ACO.275. Usually, on workspace 1, machine aldaqacr47 there is window already connected to aldaqpc160. If not, open a terminal an login typing:

   ssh acorde@aldaqpc160

2) Take the control of the Data Control Agent (DCA), (*see section Data Adquisicion Agent*).

3) Initialize the   Electronics. Go to the VME crate of Fig. 11 and in the windows with title Itu Client: go to Configuration → TTCinit. This will display a new terminal likes Fig. 14. What you need to check is the numbers of TTCrx_reset, TTCrx not ready TTCrx config, and FEE reset, the correct numbers should be: 0 0 0 0 0. see Fig. 13

4) Take calibration .

acorde@Aldaqpc160:~/AcordeScripts/> ./calibrateAllModules.sh | tee calibracion<**DATE**>.log

For example it the calibration is taken in 23 october 2009
acorde@Aldaqpc160:~/AcordeScripts/> ./calibrateAllModules.sh | tee calibration23october2009.log

(It takes 15 minutes with almost no message until the end ..)

5) Prepare detector for data taking

acorde@Aldaqpc160:~/AcordeScripts/> ./acordePrepareForRun.sh

6) Now you need to see the calibration taken, copy file to the aldaqacr46 to the imagescalibration folder like this :

acorde@aldaqpc160:~/AcordeScripts > scp calibration<DATE>.log
acorde@aldaqacr46:imagescalibration/.

Also copy the data to the account of Arturo for the moment is a temporary solution. The password should be provide to you by detector expert.
mailto:acorde@aldaqpc160
acorde@aldaqpc160:~/AcordeScripts > scp calibration<DATE>.log
afernan@aldaqgw01:/afs/cern.ch/user/a/afernan/.

7) Go to workspace 4 in the aldaqacr46 open a terminal in case is not already open and go to the images calibration folder and see the result :

acorde@aldaqacr46:imagescalibration/>./guicalibration.sh calibration<DATE>.log

you will see the result in the screen. If it look ok then got o the following step . If not take a new one check that the detector is not in busy, or check if the file is the correct one. You should see the date in the title of the histogram.

If ROOT is not present, you will see an errot mesagge
./guicalibration.sh: line 10: root: comand not found

enable it with

acorde@aldaqacr46:imagescalibration/>source enableroot.sh

7)   Deliver the DCS control, unlock the DCS in the panel of Data Control Agent, it should looks like figure 10.

Fig. 13. Windows displayed after execute: Configuration → TTCinit (step 3 on the happy hour).

8) Put the picture and the log file in the logbook using the afernan login in the entry. You should put as general entry , as type of detector ACORDE, and in the entry the number of dead channel and the numbers of noisy channel, if there was any special condition, for example if calibration was taken after hardware change. The file to upload is the jpg in the imagescalibrationfolder, .

  calibration<DATE>.logdat.jpg
  calibration<DATE>.log

6. Troubleshooting.

- ACORDE Busy state

If ACORDE is in *busy state* at the beginning of a Run, it will be declared as a "dead" detector". ACORDE can not participate in the next Run as readout detector, only as trigger detector.

To release the ACORDE busy stare, do the following:
1) Ar the DCS LV panel, execute a *power cycle* to LV ACORDE electronics channels.

2). Initialize ACORDE TTC card

3) Login to aldaqpc160 machine (as acorde user), execute the following script :

/local/home/acorde/AcordeScripts/acordePrepareForRun.sh

After this procedure, ACORDE will be ready to join a global run as readout and trigger detector.

- CTP Counters.
You can check the status of several CTP sgnal counters.
For ACORDE, the important one are:

- L0 LTU, l0inp4: multi-muon trigger signal ← average rate: 2Hz
 - L0 LTU, l0inp5: single-muon trigger signal, ← average rate: 150Hz
- Busy LTU: ACORDE_in_busy1 ← 0 for no activity state
                                            50Hz for ongoing run state
                                            2MHz Busy state (Warning!)

You can check I0inp4, i0inp5, ACORDE_in_busy1 plots in the following web page:

http://alidcscom026

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7. ACORDE contact

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