

Quick Instructions

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Computers:

There are two computers:

flctpc-lundmon – for monitoring and control

flctpc-lunddaq – for data acquisition

How to login on flctpc-lundmon:

user: ilcdaq

passwd:*****

If there is no terminal window open, open one.

How to login on flctpc-lunddaq:

Not normally needed except for copying data files. Same user and password as on flctpc-lundmon. Logging in from flctpc-lundmon do not require a password.

How to start up the data acquisition:

Login in on lctpc-lundmon. Unless already logged in. If there is no terminal window open, open one.

The RCUs to be used must be switched on before starting the DAQ, this is the only time when active RCUs are searched for. The same power supply is also the main power supply for the FECs. **It takes a minute for the RCU to boot.**

Then do (when running with the distributor box as trigger source):

>startdaq

startdaq is a script (can be found in \$HOME/bin) that login on flctpc-lunddaq and starts up the readout task in an xterm window (named ILCSERVER). In this xterm window are currently many cryptic debug outputs written. It opens as well an xterm window from lctpc-lunddaq, this window can be used to edit configuration files. After a few seconds is a graphical run control user interface started.

If the window with the readout task do not appear, and/or most of buttons in the GUI is cyan, and the 'STATUS' button is red at startup, this happens when the readout program on flctpc-lunddaq do not manager to start, then

- 1) exit the GUI
- 2) close the xterm window opened from lctpc-lunddaq
- 3) wait for a few minutes
- 4) startdaq again

How to start the online monitoring system:

>startmon

startmon is a script that starts up the monitor task in a separate window (named MONITOR) and a presenter (named MONVIEW) as the user interface. Press 'online' to connect the presenter to the monitor task. Sometimes do this fail (Do not know why), then retry by doing:

>stopmon

>startmon

How to close down the monitoring system:

>stopmon

stopmon is a script (can be found in \$HOME/bin) that kills the presenter and the monitoring task.

One can also 'exit' the presenter and do 'ctrl-c' in the monitoring task window.

When the monitoring task is stopped does it crash with some crash output written into the window.

How to close down the data acquisition:

After having stopped DAQ (how see below), 'EXIT' the GUI and do 'ctrl-c' in the daq xterm window. Type 'exit' in the xterm window opened for editing configuration files

How to startup everything

- 1) If not already on, switch on the readout electronics power supply in the test beam area
- 2) startdaq
- 3) startmon
- 4) power on FEC – press 'PowOn'
- 5) set and load PCA16 settings – press 'PcaLoad'
- 6) select 'physics' run for beam, 'pedestals' for taking pedestal run. Do not use 'test'
- 7) Press 'Start DAQ', this will load tables into each ALTRO, i.e. it will take some time. See in the ILC SERVER window the progress. **If 'STATUS' goes red an error occurred, retry by 'Stop DAQ' and then 'Start DAQ' again.**
- 8) select 'readout events' and set number of events to take, 0=until manually stop run
- 9) if the online monitor is used set 'monitor' to a nonzero value, the value is a 'downscaling' factor; 0= no monitoring, 1 = as many as possible, >1 has a bug and do not work.
- 10) If data logging is wanted check 'Logging', else uncheck it. **If you do not want logging be sure it is unchecked before starting a run.** The logging flag is always remembered from the last run started, i.e. doing uncheck and 'StopDAQ' 'StartDaq' without a new run, then the logging flag will still be set if the last run had it set.

- 11) Press 'Start run'
- 12) Press 'Stop run' when wanted

A screenshot of the GUI is further down,

Power settings:

cyan/blue indicates the status of FECs for RCUs not readout according the configuration file, where blue means that the FEC should have been on if the the RCU was readout. Cyan means it should have been off.

For FECs in an RCU to be readout indicates red that the FEC is powered off and green that it is powered on. White mean that the FEC is off but should be on. For FECs 0,1,2 and 16,17,18 can it also mean that they are powered but not readout. These power bits are also used to set the power of FEC 13,14,15 and 29,30,31.

When the GUI is started all are cyan/blue. The status is updated when powering on or 'Start DAQ'.

Pca settings:

polarity - checked is positive polarity and unchecked negative polarity of input signal.

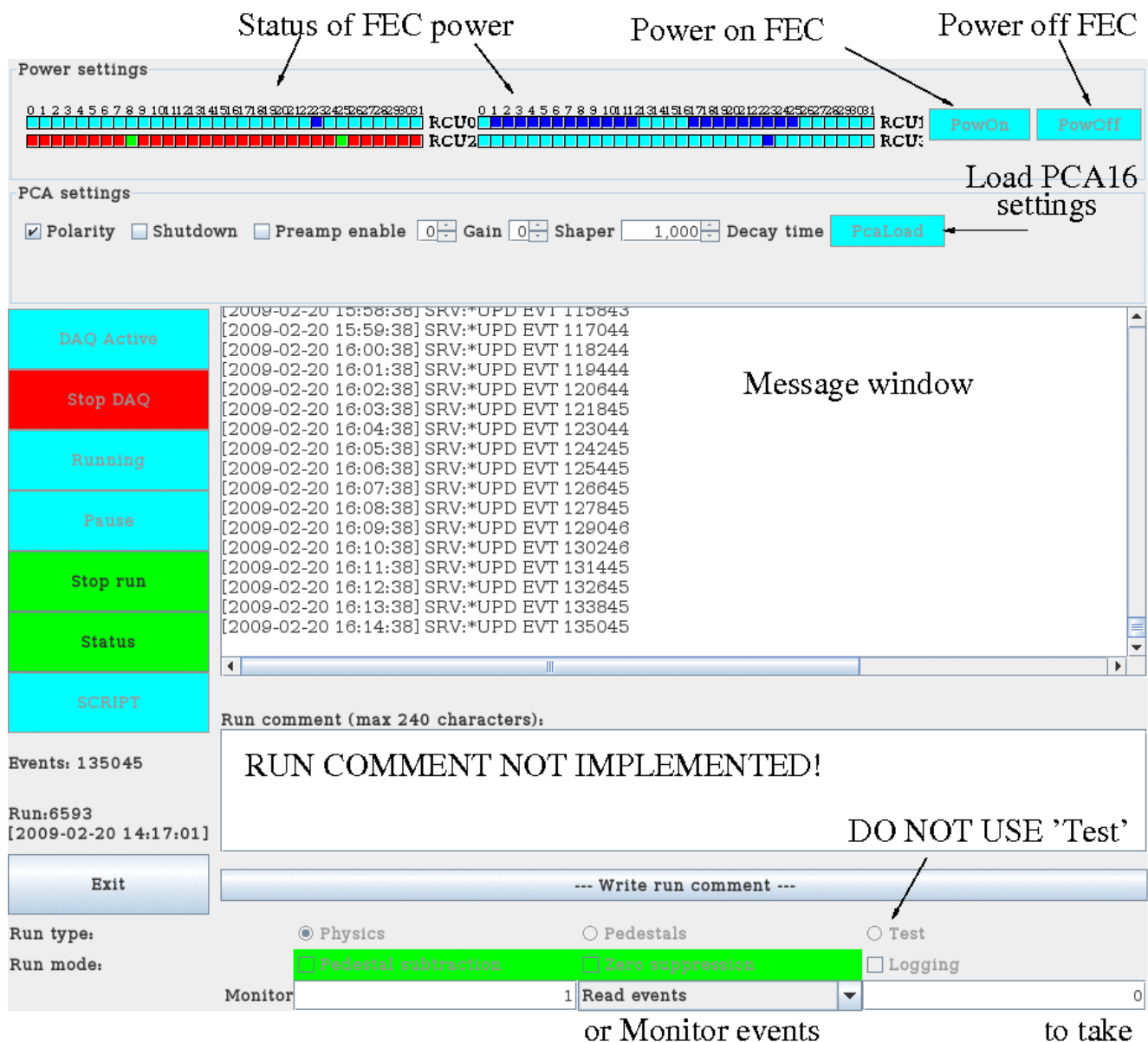
Shutdown - checked is that the PCA16 chip is switched off.

Preamplifier enable - checked is that the output is before the shaper.

Gain - 0,1,2,3 is the gain of the amplifier (12 to 27 fC/eV).

Shaping - 0,1,3,7 is the shaping time (120 to 30 ns)

Decay time - 0-2500 (0-1.5V) is the decay time in preamp enable mode, in shaper mode does it not influence very much.



Data files

Data are stored in /misc/ilcdaq/data on flctpc-lunddaq as the readout-
 <runnb>_<filenb>.dat. Maximum file size is 2GB, after that is the file closed and
 a new file is started with one higher file number. The data files must be copied
 somewhere, else the disk will quickly be full. In the situation we have now with 24
 FEC is the event size 3.8MB without zero suppression. The disk on flctpc-lunddaq
 is 450GB.

How to change configuration

- 1) stop run
- 2) stop DAQ
- 3) edit adequate configuration file. Note that to rescan active RCUs the DAQ
 must be restarted from the beginning. The configuration files are on flctpc-
 lunddaq in the directory /misc/ilcdaq/config-v4.1).

- 4) start DAQ. First power on FEC again if FEC configuration to read changed, and in this case reload the PAC16 settings.
- 5) Start run

configuration files are on the daq computer in the directory /misc/ilcdaq/config-v4.1. These files are described in another document (in the readout document under further documentation further down). They are ASCII files and editable with an editor.

How to shutdown everything

- 1) stop run if run is active
- 2) press 'Stop DAQ'
- 3) power off FEC if they should be off - 'PowOff'
- 4) shutdown the monitor and presenter programs
- 5) 'exit' the run control
- 6) do 'ctrl-c' in the daq xterm window
- 7) close all xterm windows opened from the flctpc-lunddaq
- 8) If needed, switch off the readout electronics power supply in the test beam area.

Using the presenter

- 1) choose RCU and FEC to monitor – only one FEC at a time can be monitored
- 2) Select online – this connects to the online monitoring task
- 3) Change FEC when needed – then press 'FEC to monitor' – all histograms are cleared.
- 4) press 'Getevent' to fill one event histograms (e.g. time distributions).
- 5) Change the value of and press 'Altro to show' to view another ALTRO in the selected FEC.
- 6) 'Time distribution' and 'Pulse Height histograms' show all 16 channels for an ALTRO.
- 7) 'Clear' will clear all histograms. Histograms are not cleared at a new run!

A screenshot of the presenter is shown below.

Single event histograms are filled when 'Getevt' is selected.

Available histograms of interest are for the FEC selected:

HPH – pulse heights for individual channels

HTIME – time distribution for a single event

HMAXCHTIME – time for maximum found pulseheight

HMAXCHADC – maximum pulse height for each channel

For selected RCU:

HCHEXIST – plots of found channels (none should be missing for FECs readout)

General:

LENGTH_2AEE – data length for channels with h/w readout error

LENGTH_2AAA – data length for channels with no readout error

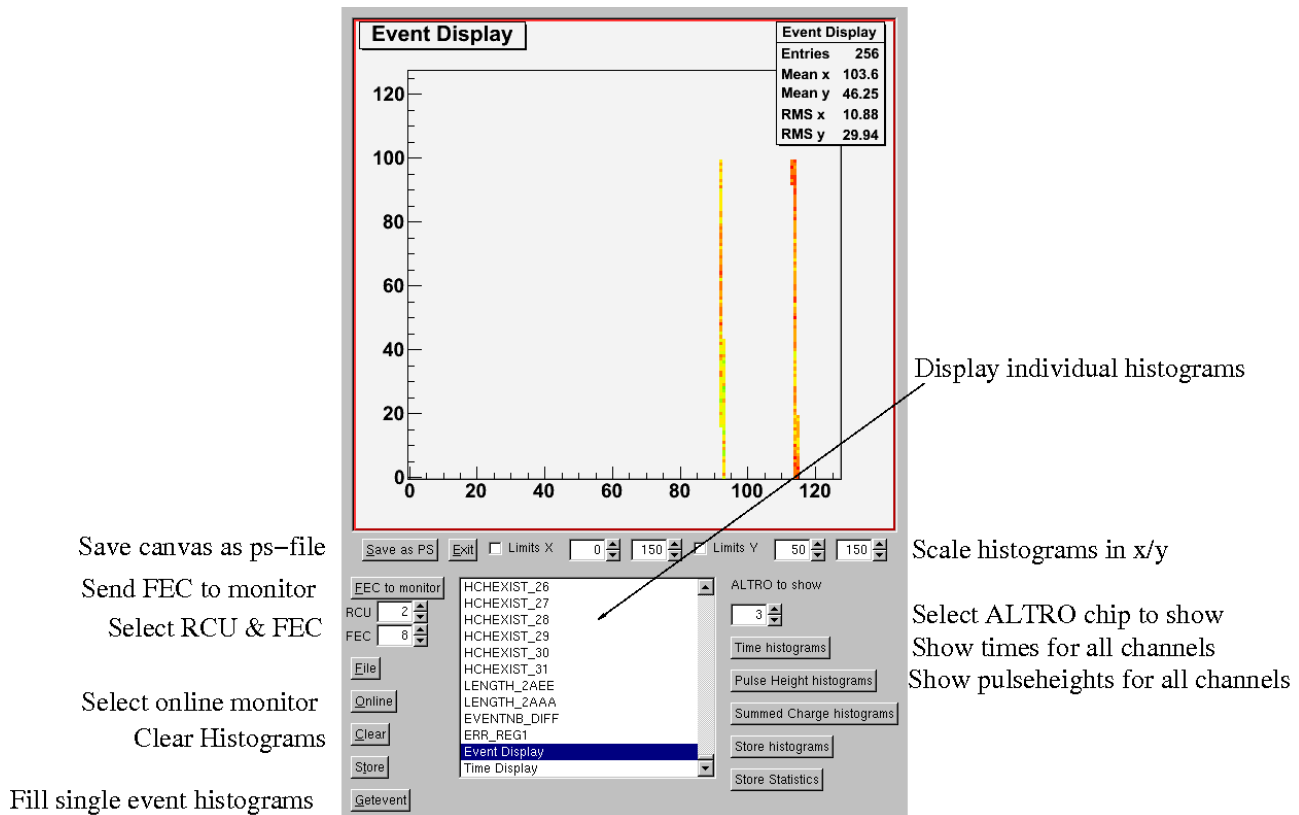
EVENTNB_DIFF – differences in event number between readout/DBOX and readout/TLU.

ERR_REG1 – bit pattern of RCU trailer error register 1 bits

ERR_REG2 – bit pattern of RCU trailer error register 2 bits

Event display – color coded pulse heights for all channels and one event

Time display – color code times for all channels and one event



The presenter

How to make a pedestal run

Pedestals are calculated by the online monitor task. Pedestals are dependent on the PCA16 settings, i.e. there must be pedestal files for the settings used if one want to use pedestal subtraction.

In the run control GUI:

- 1) check the pedestal check box
- 2) select 'monitor events' instead of 'readout events'
- 3) set number of events to use in the calculations, e.g. 300 should be enough.
- 4) start run
- 5) the run will stop automatically after the number events requested are monitored
- 6) set back to 'readout events' and number of events to read to what it should be (0 = infinite or until stop run)

the files are stored in \$HOME/root/pedestals (one file for each possible RCU) on flcptc-lundmon. The files are named pedestals-<rcuid>-<pac16 settings in hex> - <decay time in decimal>.new With the command 'pedcopy' will all pedestal files in this directory be copied to the DAQ computer (to directory /misc/ilcdaq/config-v4.1) to the same file name but with extension .dat.

The trigger system

is based on the Trigger Logic Unit (TLU) and the distributor box (DBOX) which is the interface between the trigger system and ALTRO readout RCUs. The RCU get trigger and clock from the DBOX. If the clock disappear then the RCU will hang, and one must cycle the power of it.

Do not switch off the DBOX without first switching off the FEC from the run control GUI and then the low voltage power supply.

Always switch off the FEC from the run control GUI before the low voltage power supply.

Problem:

It has happened (though rarely) that the DBOX network stop to work, then it will not receive an event acknowledge from the readout and it will timeout after one second (TO yellow light blink on DBOX and BUSY red light is on for a second). The only way I know to reset it is to cycle the power. So do 'Stop run', 'Stop DAQ' if the are active and note the order of cycling power as described above; i.e 'PowOff' in run control and then cycle power on RCU. Wait a minute for the RCU to boot.

On the TLU control computer is the general trigger setup, where one select trigger source (beam, cosmons, random). It happens that this window die (though the DAQ runs). If one want to change the trigger configuration then one must restart it. Follow instructions which is at the flcptc-tlupc computer.

Further documentation

presenter:

<http://www.hep.lu.se/eudet/daq/doc/presenter-v2.2.pdf>

run control:

<http://www.hep.lu.se/eudet/daq/doc/gui-v2.4.pdf>

monitor:

<http://www.hep.lu.se/eudet/daq/doc/monitor-v4.4.pdf>

readout:

<http://www.hep.lu.se/eudet/daq/doc/readout-v4.1.pdf>

dataformat:

<http://www.hep.lu.se/eudet/daq/doc/dataformat-v4.1.pdf>

This document can be found as:

<http://www.hep.lu.se/eudet/daq/doc/instructions.pdf>