JRA2
TPC DAQ

Status and plans

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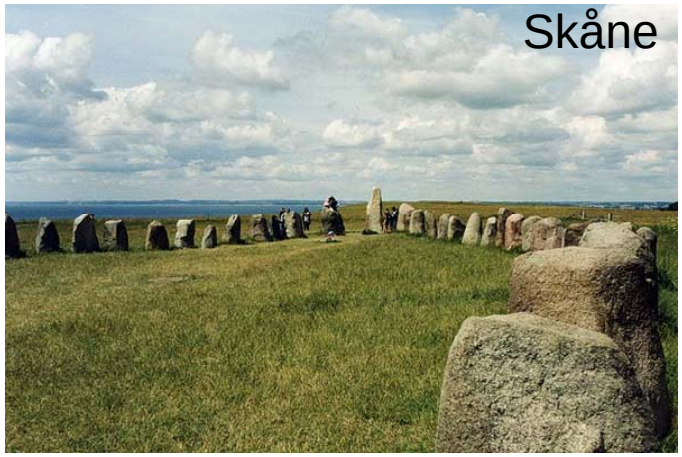
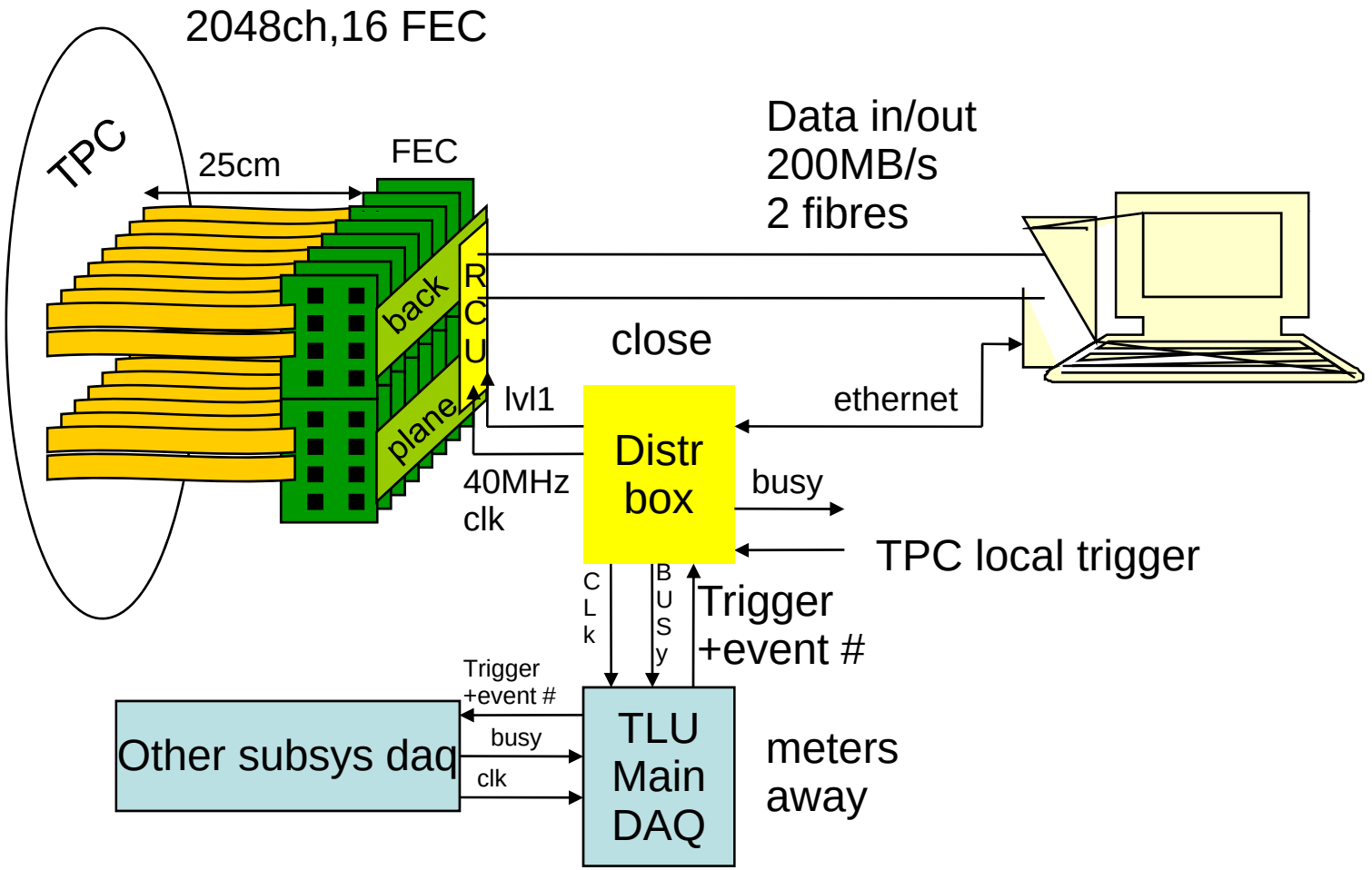
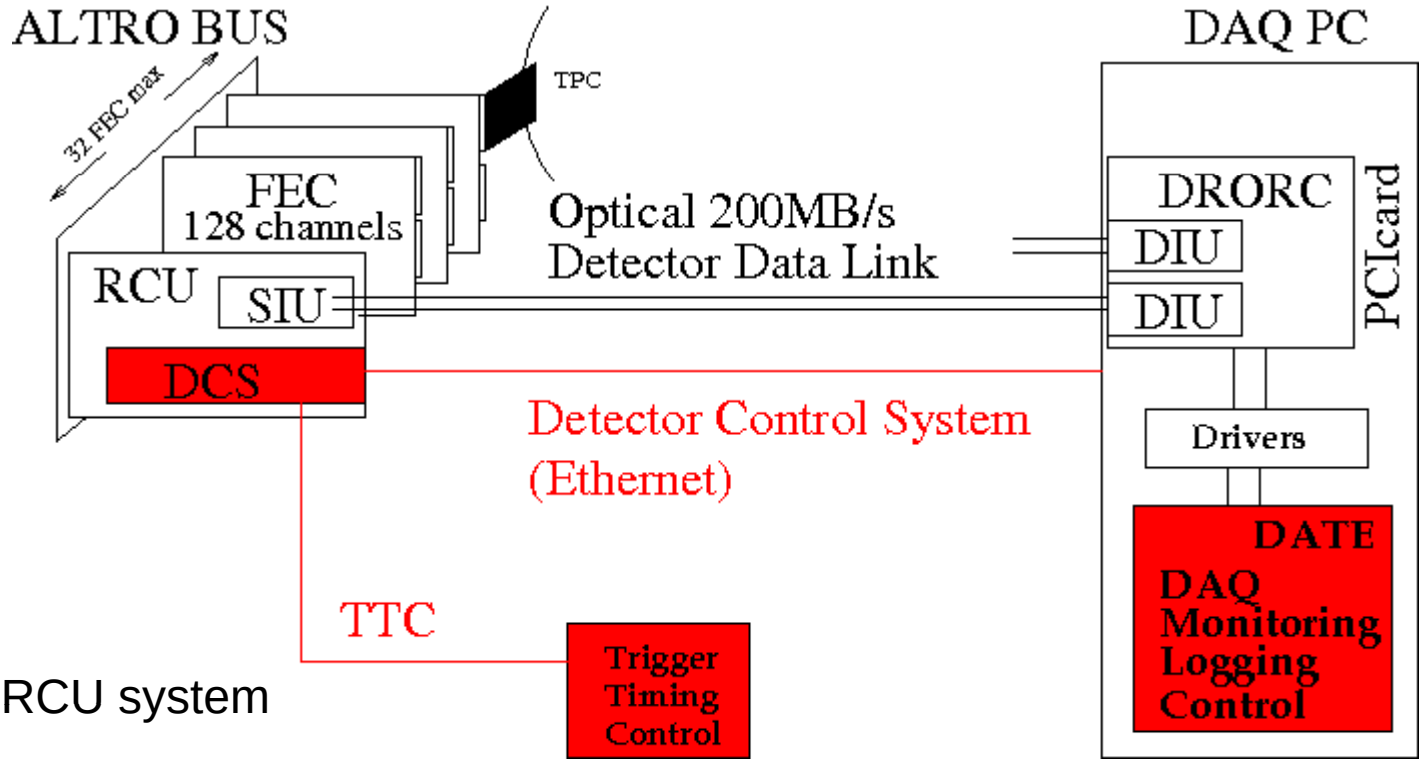


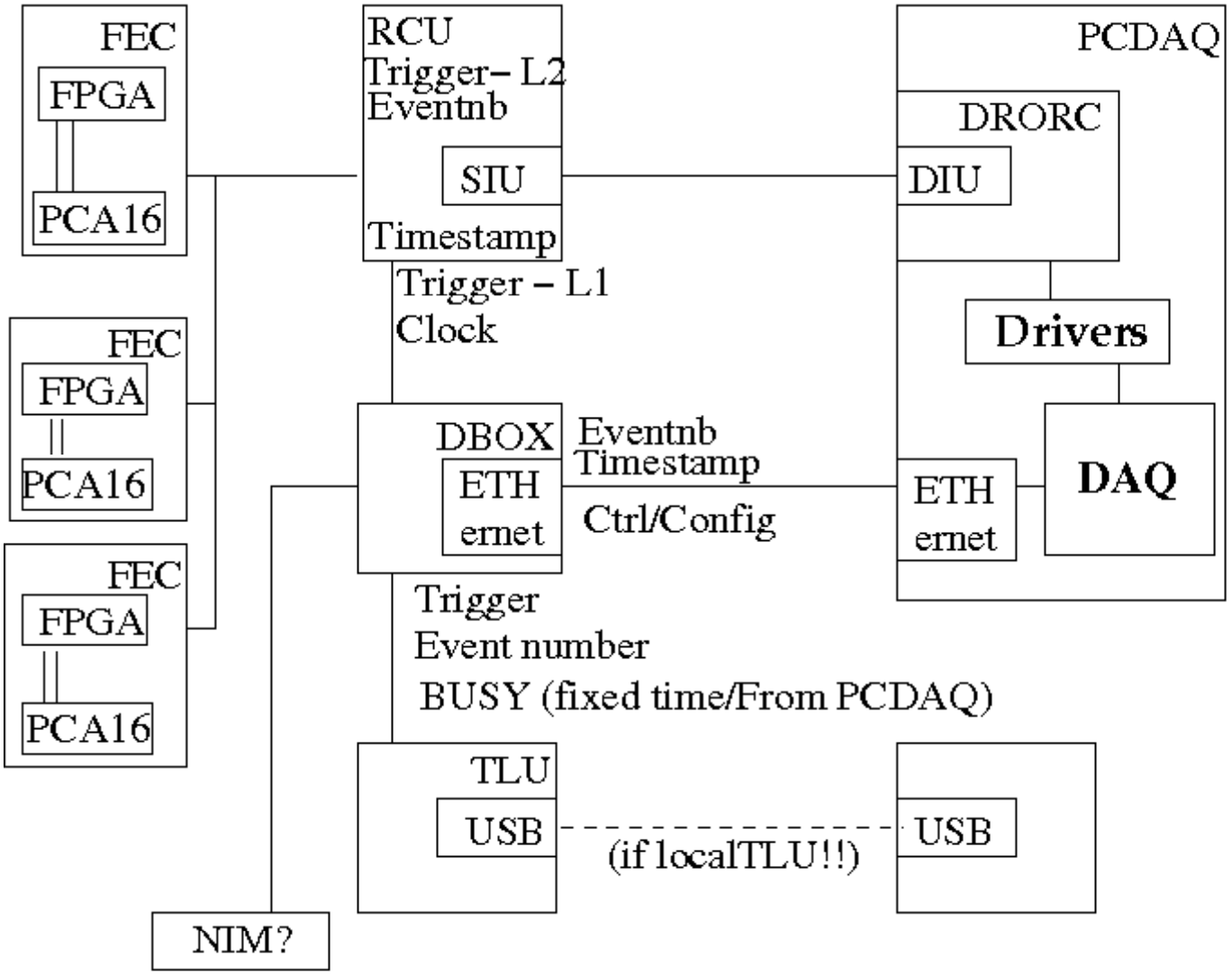

2048ch,16 FEC
TPC
25cm
FEC
back
plane
RCU
Data in/out
200MB/s
2 fibres
close
lvl1
ethernet
Distr
box
40MHz
clk
busy
TPC local trigger
CLk
BUSy
Trigger
+event #
Trigger
+event #
busy
clk
Other subsys daq
TLU
Main
DAQ
meters
away

Based on the ALICE TPC readout:

Front End Card (FEC), to be modified for new amplifier
Readout Control Unit (RCU), modified for clock/trigger/25Mhz sample clock
Source Interface Unit (SIU)
Read Out Receiver Card (DRORC), Destination Interface Unit (DIU)
ALICE API/drivers
Build our own DAQ on top
Distributor Box (DBOX) to distribute clock/trigger/busy
Interface to common DAQ



EUDET: 1 RCU
10000 ch: 4 RCU
possible to distribute 1 RCU system

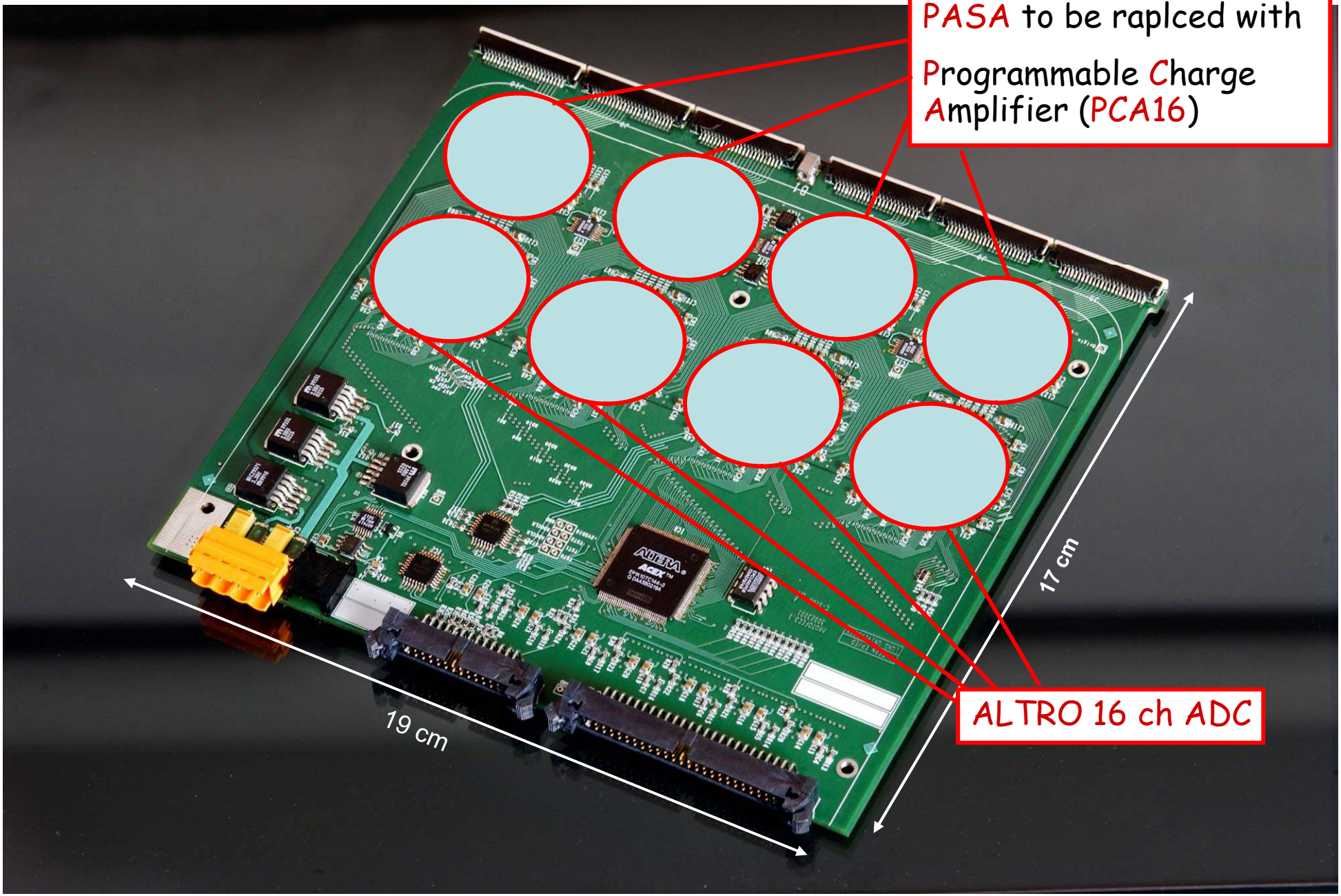


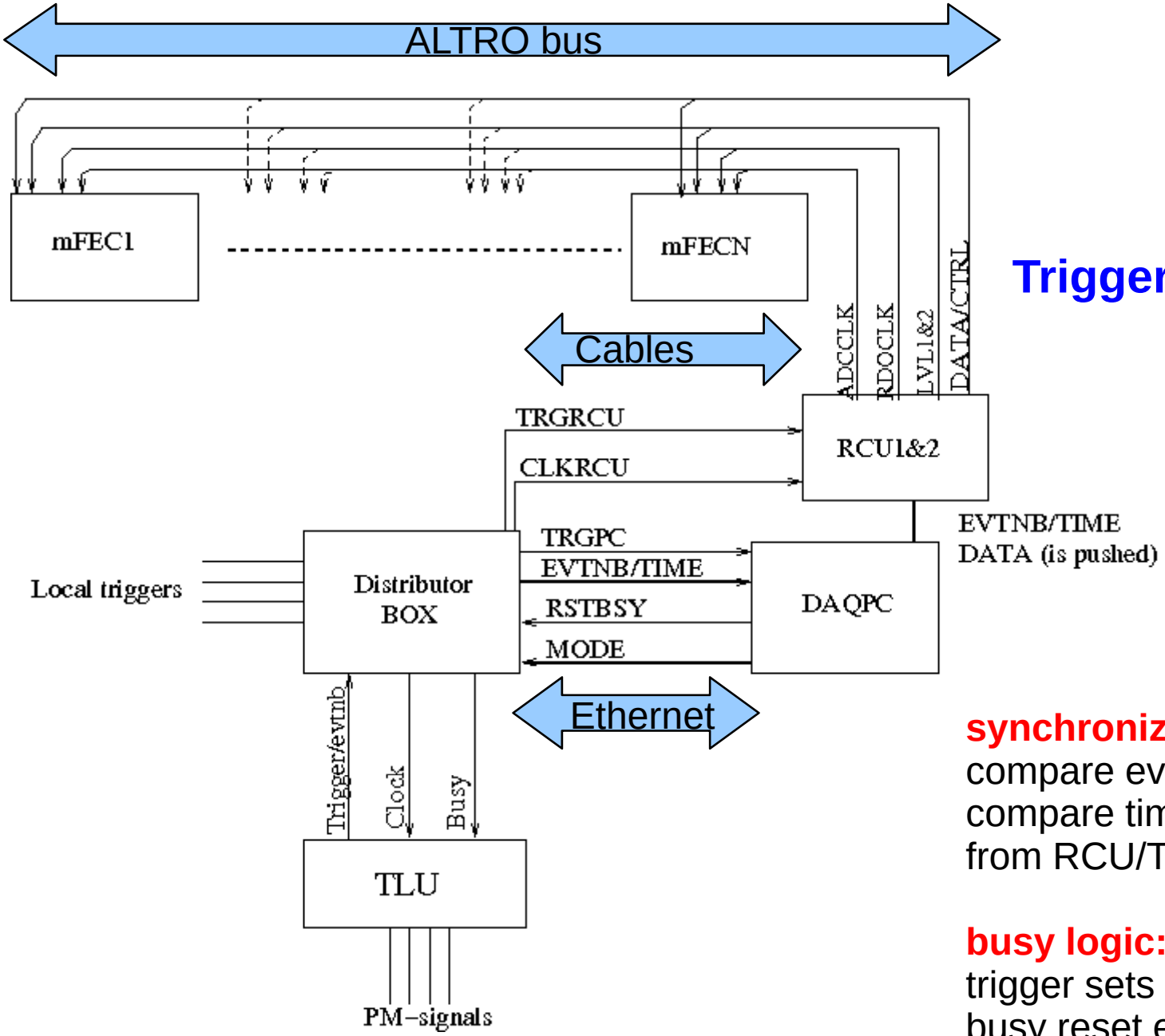
Hardware overview

FrontEndCard
ReadoutControlUnit
ReadOutReceivrCard
DistributorBOX

Local triggers: PMT, DBOX generator, local TLU,ETHernet
External triggers: TLU

ALICE TPC Front End Card



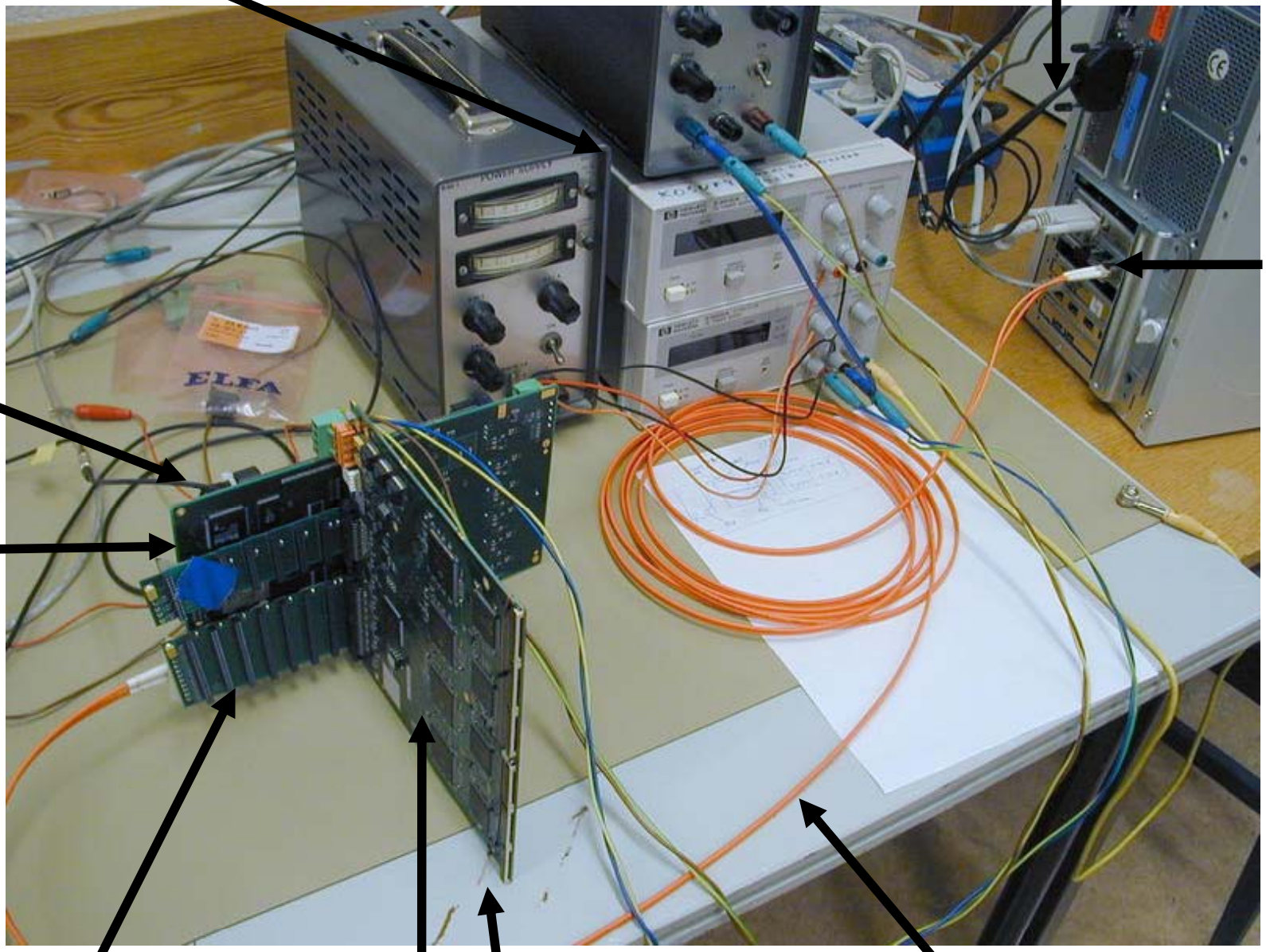


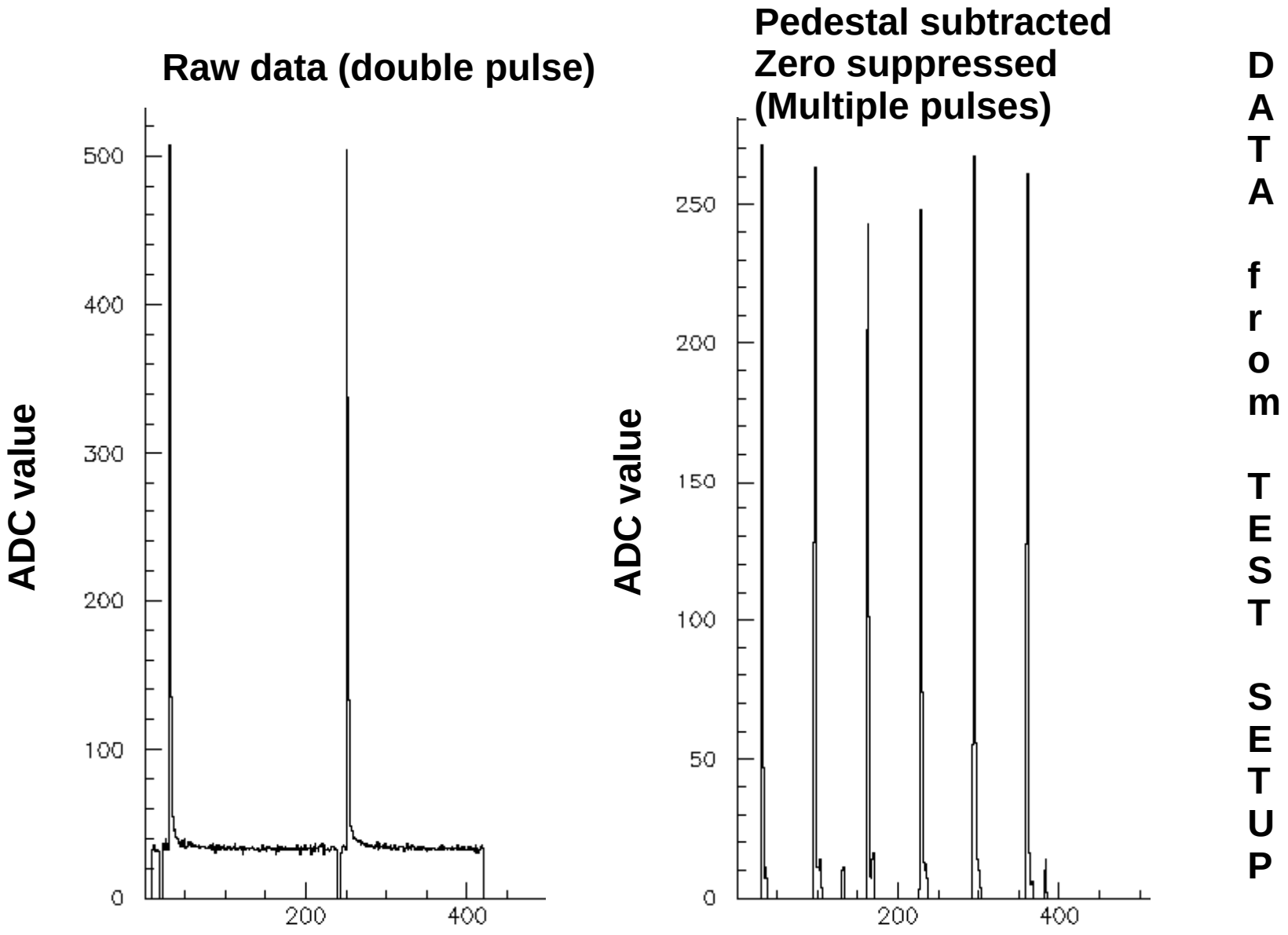
Trigger/Busy system

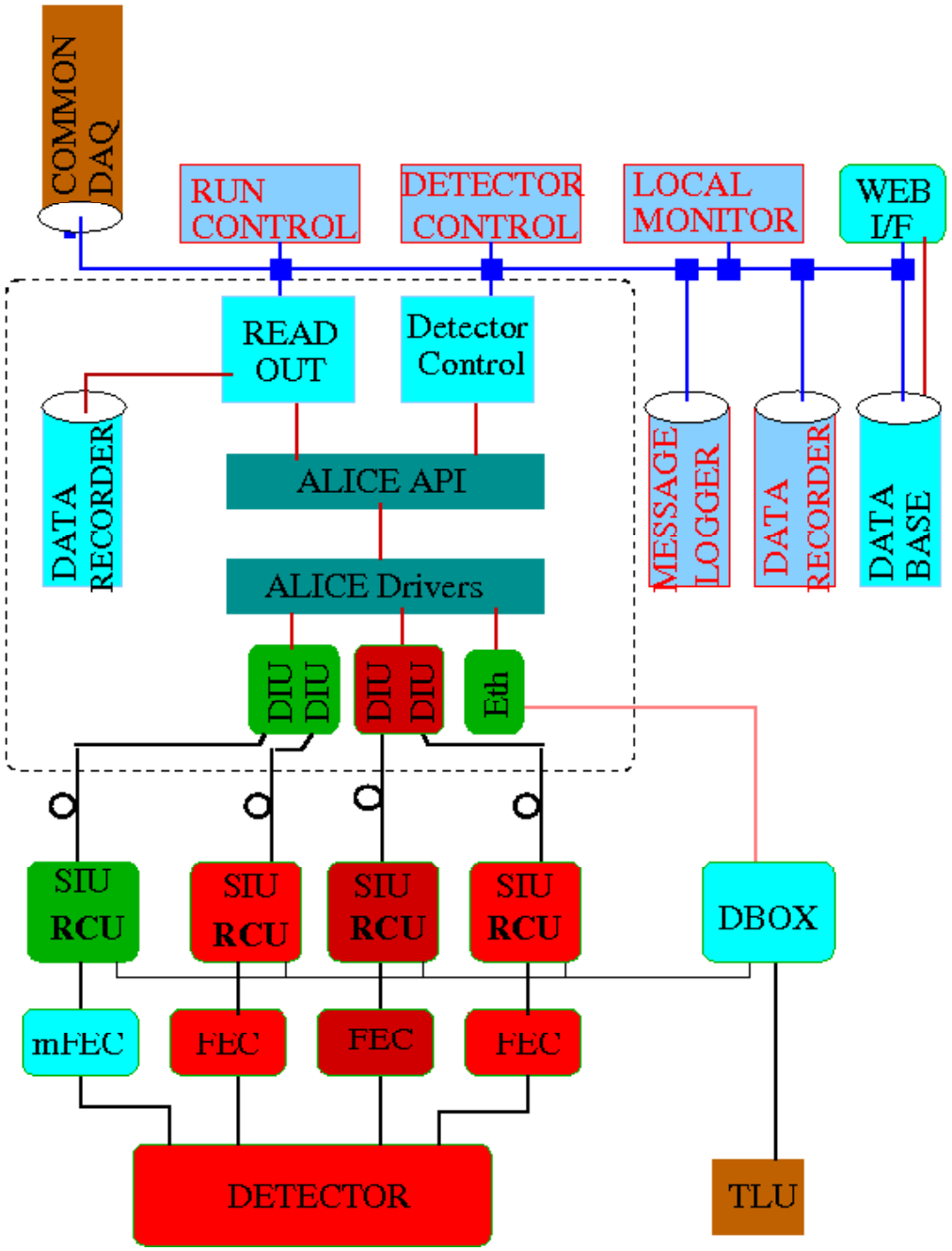
synchronization:
compare event number
compare time stamps
from RCU/TLU/DAQPC

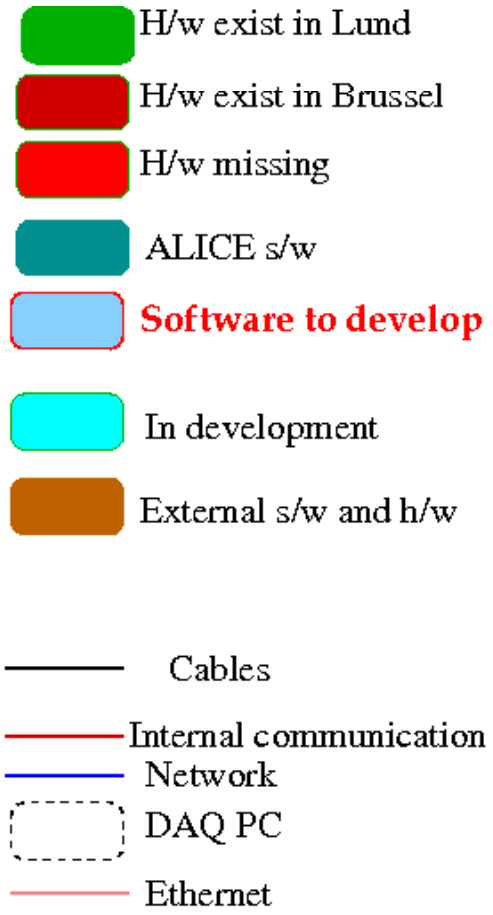
busy logic:
trigger sets system busy
busy reset either:
1) DAQPC via ethernet
2) Fixed time in distributor box

TEST SETUP


Power
Busy/Control
(Parallel port)
DRORC
Trigger
RCU
Backplane
ALICE FEC
Pulser
Optical fiber


Raw data (double pulse)
ADC value
500
400
300
200
100
0
200
400
Pedestal subtracted
Zero suppressed
(Multiple pulses)
ADC value
250
200
150
100
50
0
200
400
TIME = 100ns per bin (10 MHz sample clock)
410 samples
DATA from TEST SETUP





Use ALICE drivers and APIs as is
Build DAQ (readout/control) on top
Interface to common DAQ

SUMMARY

Based on ALICE TPC readout
New preamplifier on front end card
Using ALICE drivers
Build simple DAQ on top
Distributor box to distribute trigger/clock/busy

Simple test setup working

Work in progress on:
front end cards
distributor box
readout of hardware
readout configuration

Missing:
run control
monitoring
detector control
data transfer and format