

IFR Prototipe

QC Pizza Box  
DAQ, Monitoring Online and ODC

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## Outline

- QC PizzaBox
- General setup for DAQ-ODC-Monitoring Online -> BIRO-TDC
  - DAQ
  - Monitoring Online
  - ODC

## Preliminary on QC PizzaBox

### ➤ Goals of Quality Control test:

- ✓ Check the integrity of chain *scint – fibers - SiPM*
- ✓ Check the uniformity of pizzabox in terms of singles rate at specific working points

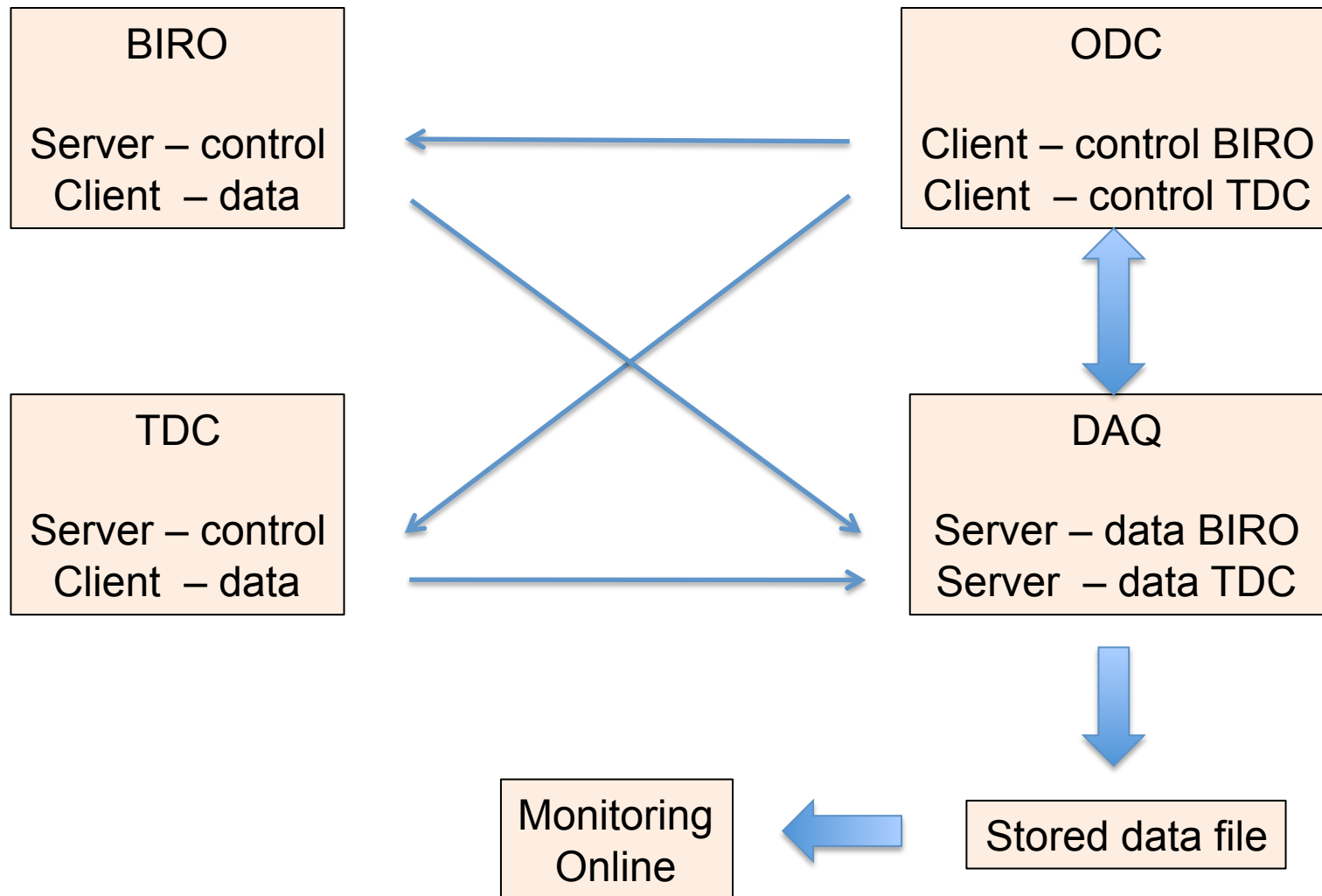
### ➤ Setup and Method of QC:

- Pizzabox will be connected to an ABC-board and it will be tested with cosmics
- Fixed same Gain for all channel -> Vbias calculated with characterization parameters
- a scan on threshold will be performed in order to “saperate” noise from cosmics
- single rates will be measured and plotted to have realtime response

### ➤ Software: Labview or Qt?

- ABC and PC connected via serial port
- **Labview**: all function to control Vbias, Vthr and to measure singles rate are available and tested from characterization. Easy to plot histograms of singles rate.
- Qt: all function have to be written and tested. To produce histogram, Qt needs Root libraries: this means a dedicated PC with specific configuration and a lot of work!!!

Overview of DAQ-ODC-Monitoring Online -> BIRO - TDC



## DAQ Status

- DAQ Tested with a Simulated-BIRO-app running on different PC:
  - ✓ DAQ send *Startrun* and *Stoprun* command via TCP/IP to BIRO/Odc
  - ✓ DAQ receives pack-events from BIRO via TCP/IP
  
- Performance
  - DAQ receiver follow the sender up to  $\approx 4$  kHz (events) with a local lan PC – hub – PC
  - DAQ preprocessing takes more time... depending on the operations to do:  
Find complete events and store into a file
  
- Next steps
  - ✓ test DAQ-BIRO with real BIRO
  - ✓ implementation of a second BIRO acq (for the second crate) and TDC
  - ✓ monitoring connection
  - ✓ other on preprocessing...

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# DAQ Screenshot

**Prototype DAQ test**

**Control Panel**

Start Run      Start Auto Run  
Stop Run      Stop Auto Run

Eventi da acquisire: 10000      N. of runs: 1

Running Mode:      Run Number:      Acq status:      Preprocess status:      Reset

Start OnLine Monitor      DAQ Settings

**Acquisition Thread**

Stored events \*      0%      Frequenza

**Preprocessing Thread**

**BIRO**

Acquired events \*      Preproc events      Failed events  
0%      0%      0%

Frequenza

**TDC**

Acquired events      Preproc events      Failed events  
0%      0%      0%

Frequenza

**Dialog**

BIRO and TDC Settings      Path Settings

**Crate Biro 1**

Sender Side: IP address: 192.84.144.169      Port: 34343

Receiver Side: Port: 45454      Boards: 8      Samples: 3

**Crate Biro 2**  Active?

Sender Side: IP address: 192.168.0.2      Port: 34343

Receiver Side: Port: 34343      Boards: 1      Samples: 1

**Crate TDC**

IP address: 192.168.0.3      Port: 45454

**Da finire..**

Save and Quit

## Monitoring Online Status

### ➤ General

- will show hit occupancy of the detector accumulated in a fixed number of events/ every fixed time
- will perform a processing of data and return rootuples
- the application is independent from DAQ and Odc
- the application will be realized with Qt recompiled with Root libraries

### ➤ Status

- realization just started
- decode of raw data files into hit information



## Online Detector Control

### ➤ Settings

- ✓ Read Vbias, Vthrh, Vthrl from a Settings\_File and read detector configuration from a Detector\_Config\_File
- ✓ Store Vbias, Vthrh, Vthrl into a specific Settings\_File, in order to be recalled and to have a correspondence between setting and acquired run
- ✓ Set Vbias:
  - Set all channel
  - Set single layer
  - Set single channel
- ✓ Set Gain:
  - set same Gain for all channel: Vbias is calculated from the characteristic *Gain vs Vbias*
  - set Gain for single layer or channel
- ✓ Set Vthr (presented as n.5 PHE):
  - set n.5 PHE for all channel: real value of Vthr is calculated from the characteristic *0.5PHE vs Vbias* and *Gain vs Vbias*
- ✓ Different colors on cells give indication on parameters and on their status (changed, submitted, all channels with same values ...)

### ➤ Rate monitoring

### ➤ Connection monitoring

### ➤ ODC and DAQ run together:

- DAQ send *run\_number* to Odc and a log file with *run\_number* → *V config* → *Detector Config* association will be produced.
- DAQ send status of data-connection

### ➤ Detector configuration file: will be edited and modified by a simple electronic sheet

- different detector configuration will be predefined

# Online Detector Control - ScreenShot

The screenshot displays a software interface for online detector control. It features a main window titled "Dialog" with three tabs: "Voltage - Gain - Thr" (selected), "Detector Config", and "Network Config".

The "Voltage - Gain - Thr" tab contains two main sections:

- AllChSet:** A section with a checked checkbox and a "SubmitAll" button. It includes four spinners for "Vbias" (34,00), "Gain" (0,014), "ThrH" (0,5), and "ThrL" (0,5).
- Layer Set:** A section with a checked checkbox and a table of parameters for nine layers (Layer 0 to Layer 8). Each layer has spinners for Vbias, Gain, ThrH, and ThrL. The "ThrH" value for Layer 1 is highlighted in red.

On the right side, there is a "RateMeter" section with a vertical stack of ten input fields, each containing the number "0". Below this stack is a button labeled "OpenRateMor".

At the bottom of the interface, there are four buttons: "OpenVSet", "OpenGainSet", "OpenThrHSet", and "OpenThrLSet". A separate "Update ABC Board" button is located at the bottom left.

Layer	Vbias	Gain	ThrH	ThrL
Layer 0	34,00	0,015	0,5	0,5
Layer 1	34,00	0,014	1,5	0,5
Layer 2	34,00	0,014	0,5	0,5
Layer 3	34,00	0,014	0,5	0,5
Layer 4	34,00	0,014	0,5	0,5
Layer 5	34,00	0,014	0,5	0,5
Layer 6	34,00	0,014	0,5	0,5
Layer 7	34,00	0,014	0,5	0,5
Layer 8	34,00	0,014	0,5	0,5

# Online Detector Control - ScreenShot

