



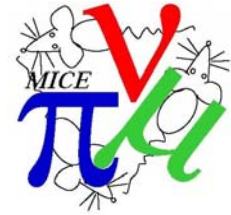
Detector DAQ Hardware Status

Jean-Sebastien Graulich, Geneva

- o Since CM19
- o Detector DAQ hardware Overview
- o Trigger Overview
- o Front End Electronics
- o Schedule Milestones
- o Summary



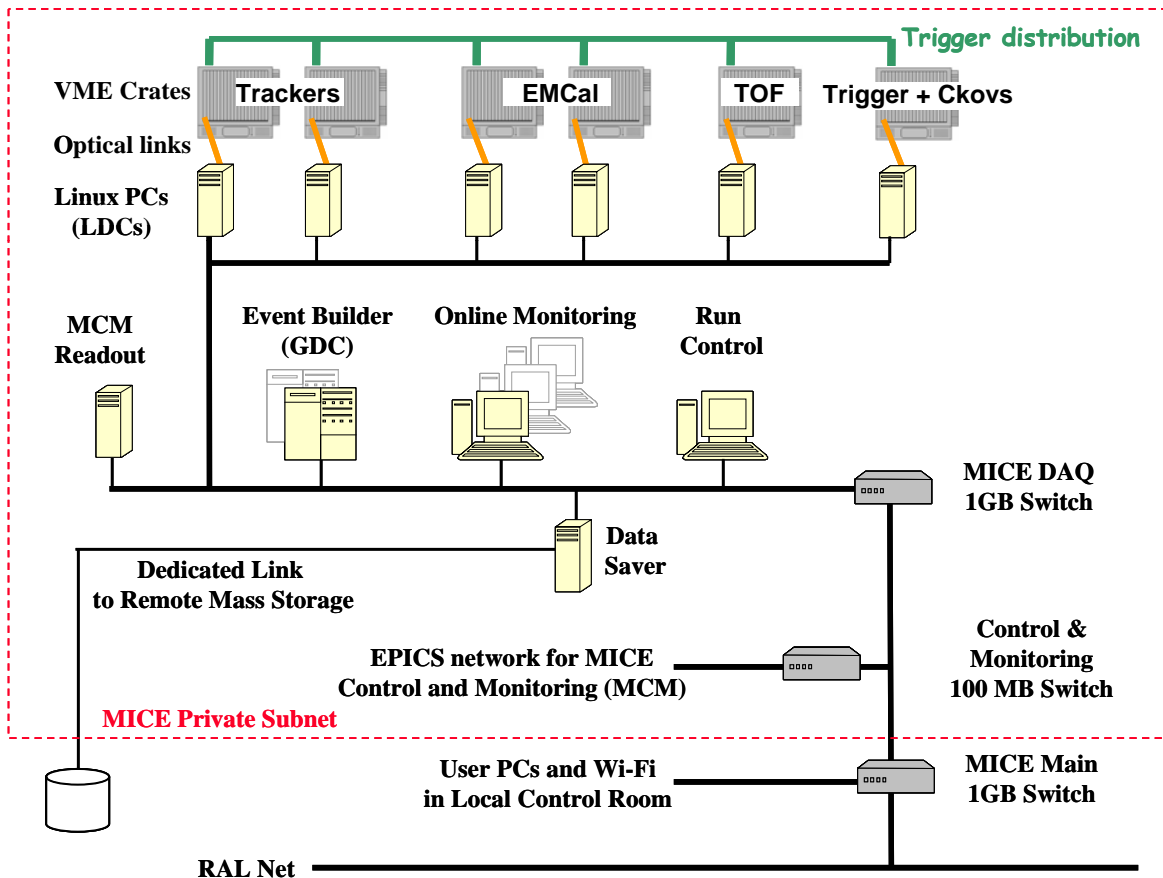
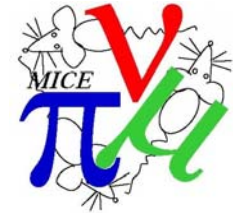
Since CM19



- ◆ **DAQ system has been moved twice**
 - R12 -> R8 in November for the cosmic test
 - R8 -> MLCR last week
- ◆ **Cosmic test**
 - DAQ System and Cosmics trigger were ready and operational
 - Tracker read-out couldn't be tested
- ◆ **Shaper production**
 - PCBs production finished in Sofia
 - Module production shared between Sofia and Geneva
 - 10 boards produced (160 channels)
 - 3 boards already at RAL
- ◆ **Spare VME power supply has been ordered**
 - Delivery expected after October 2008
- ◆ **Servers for Online Reconstruction have been delivered**



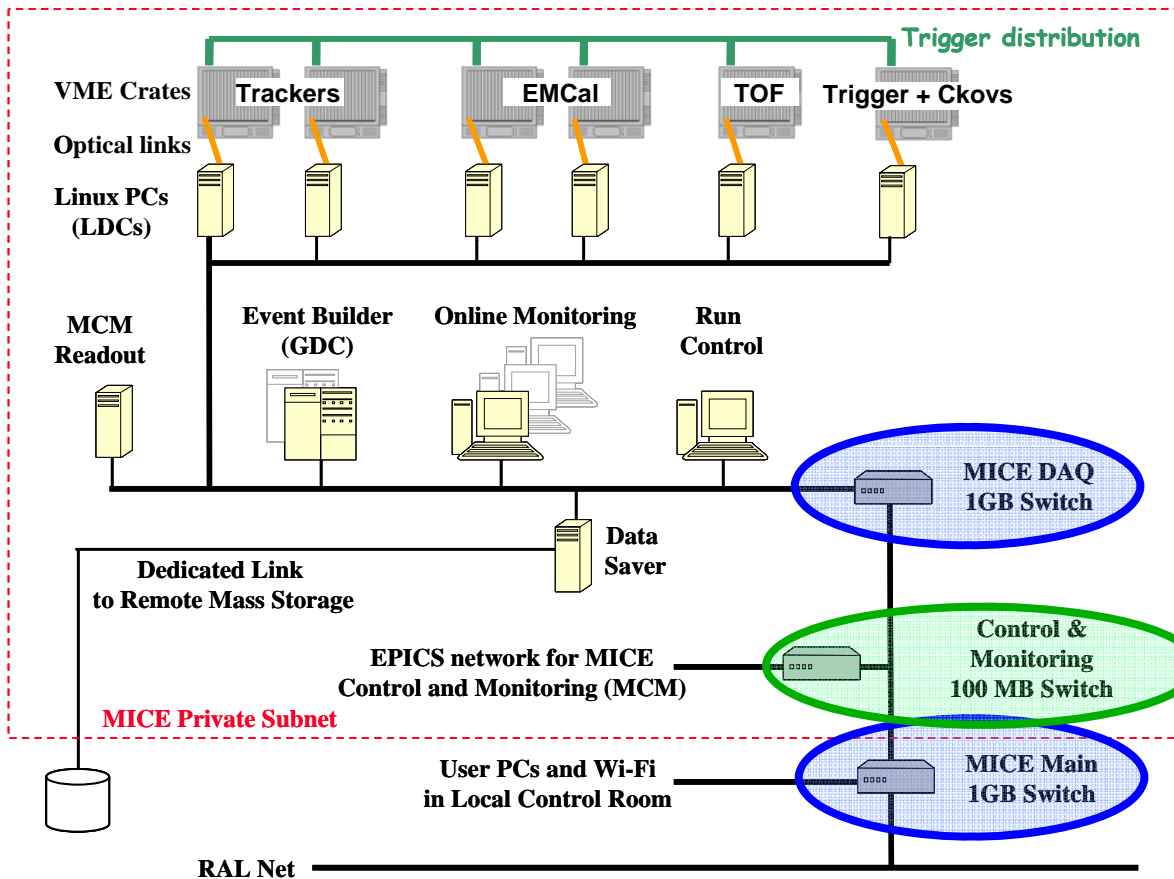
D-DAQ Hardware Overview



All the hardware in hand for stage I and beyond



D-DAQ Hardware Overview

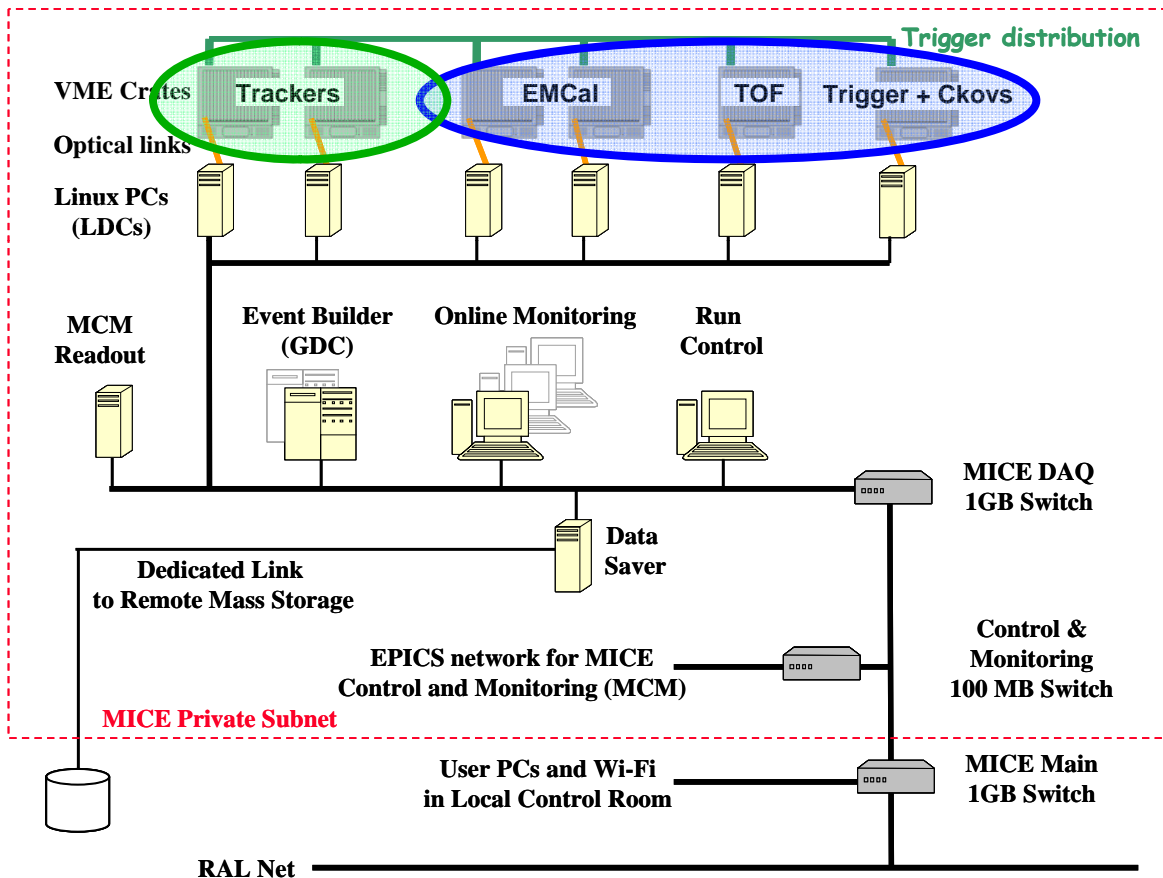


NETWORK

- 2 x Gb Switches
24 ports
at RAL
not configured yet
- 1 x 100 Mb Switch
48 ports
installed in MLCR
Not fully operational yet



D-DAQ Hardware Overview



VME Crates

- 4 x 6U VME Crates
+ Power supply
2 at RAL
2 being shipped
1 Spare ordered

- 2 x 6U VME Crates
Provided by the tracker group
Will be installed in the hall

VME-PCi Interfaces

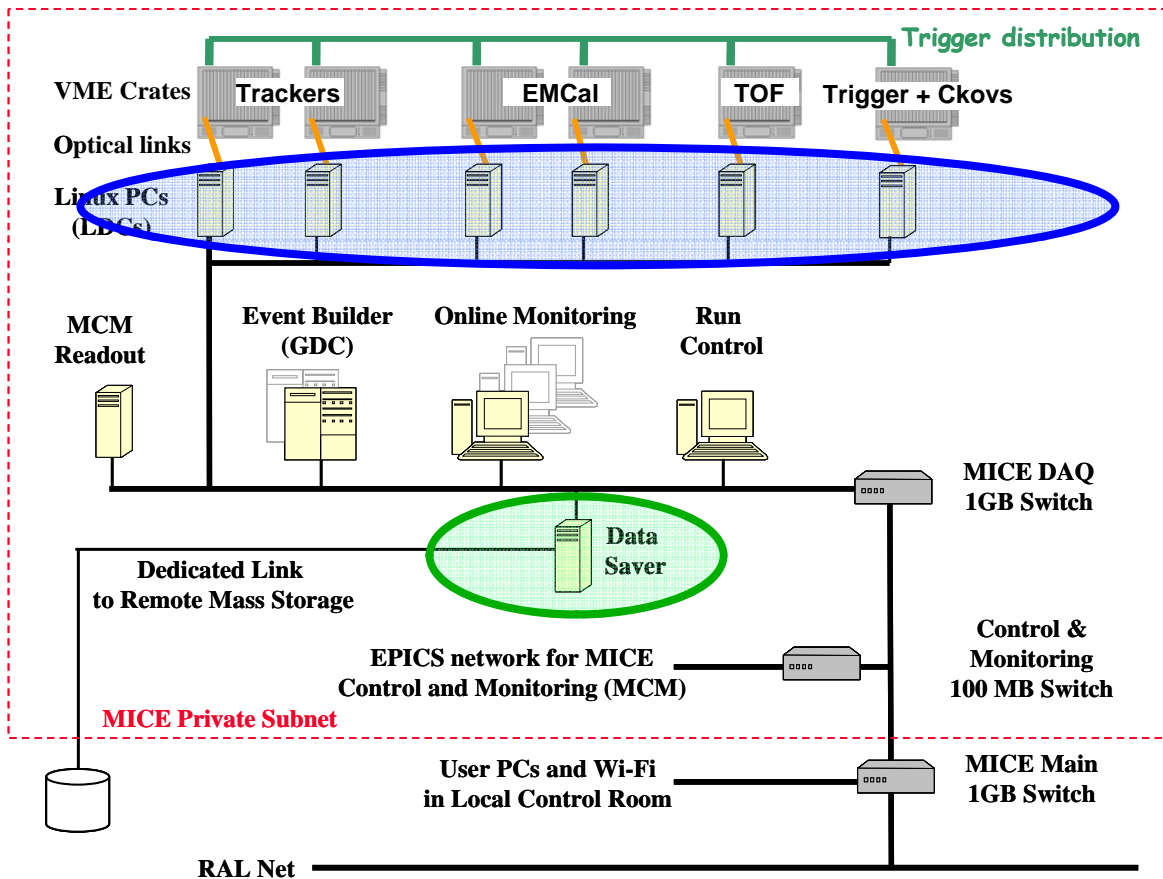
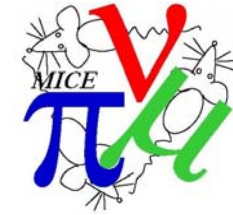
- 2 at RAL
5 in Geneva

Optical fibers

- 2 x 5 m at RAL
3 x 50 m at RAL



D-DAQ Hardware Overview



LDC PCs

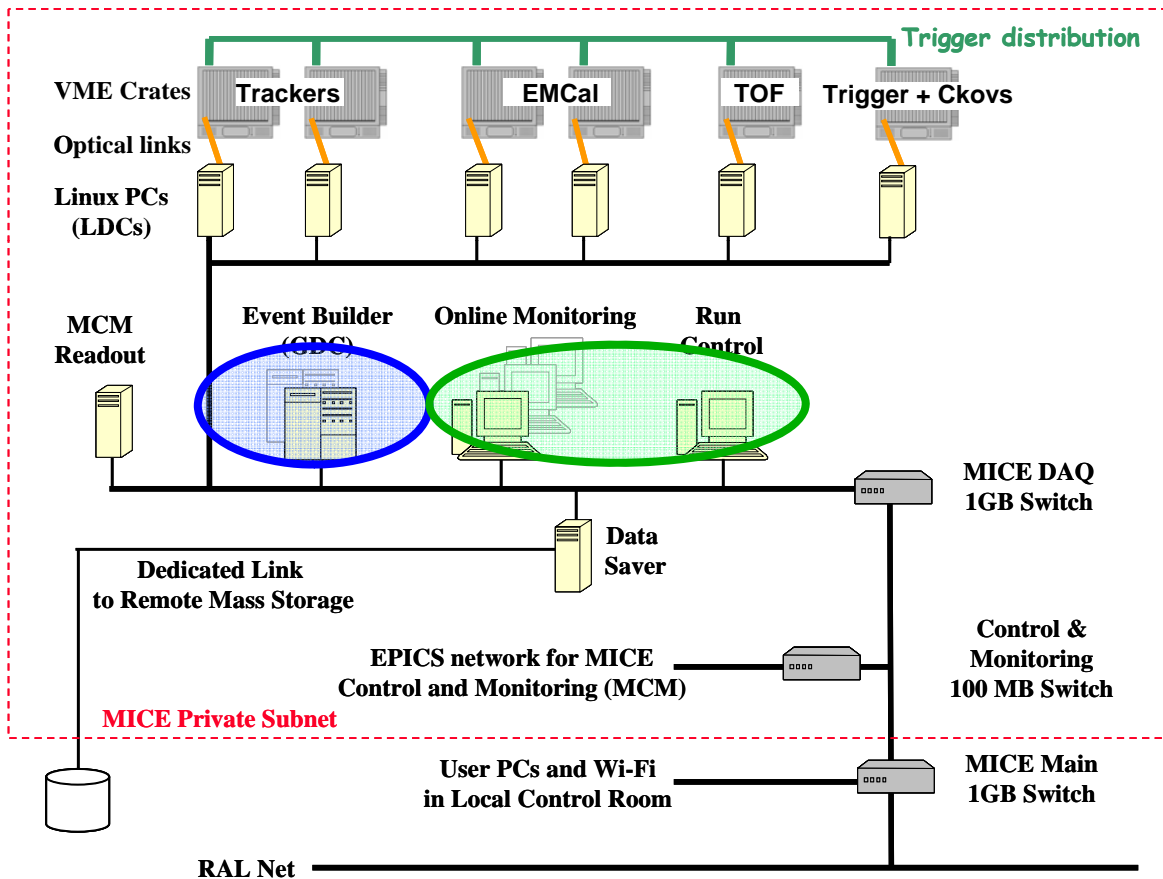
- 5 in hand
- Rackable
- 1 at RAL
- 4 in Geneva

Data Saver PC

- At RAL
- Rackable
- 1 at RAL
- 4 in Geneva



D-DAQ Hardware Overview



GDC PCs

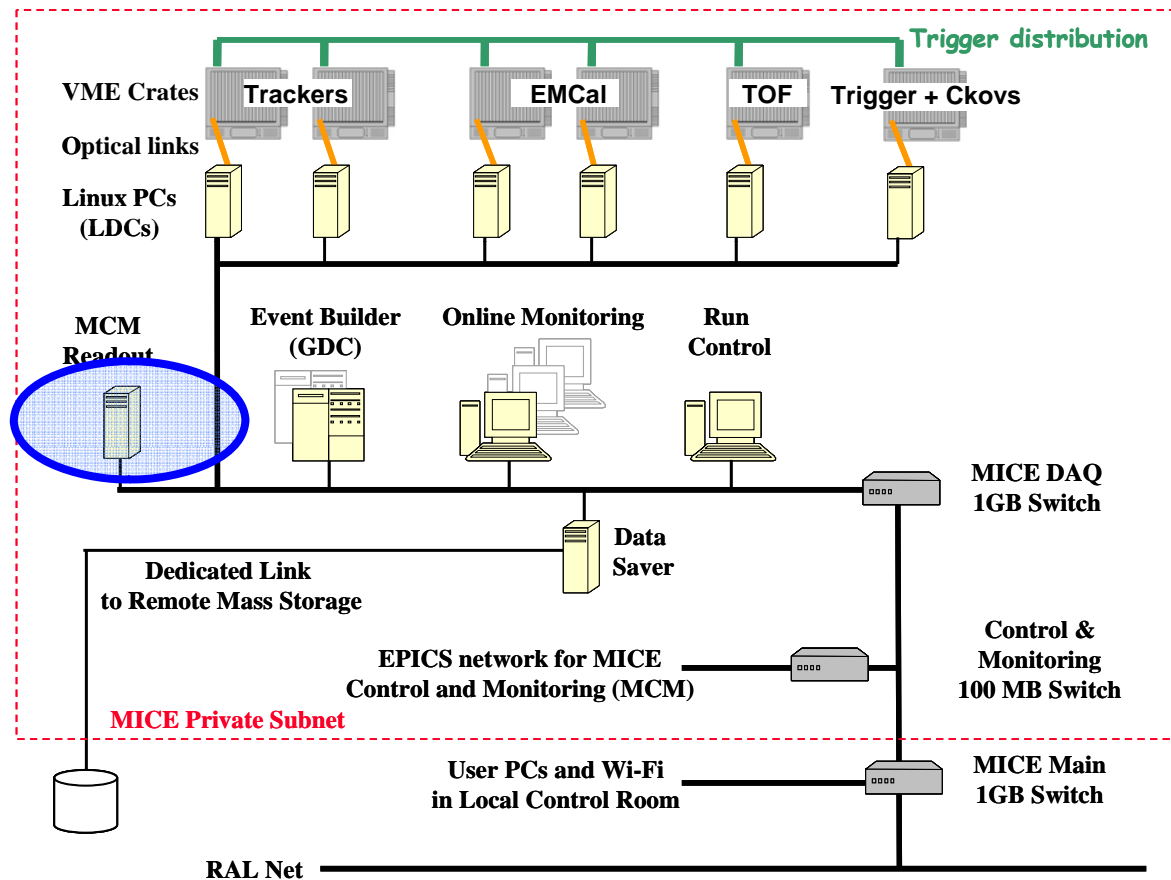
- Both in hand
- Not Rackable
- 1 at RAL
- 1 in Geneva

Work stations

- 2 at RAL
- Run Control
- Online Monitoring
- More needed ?



D-DAQ Hardware Overview



MCM Readout

- Considering using the Trigger LDC for that task
- Tests needed

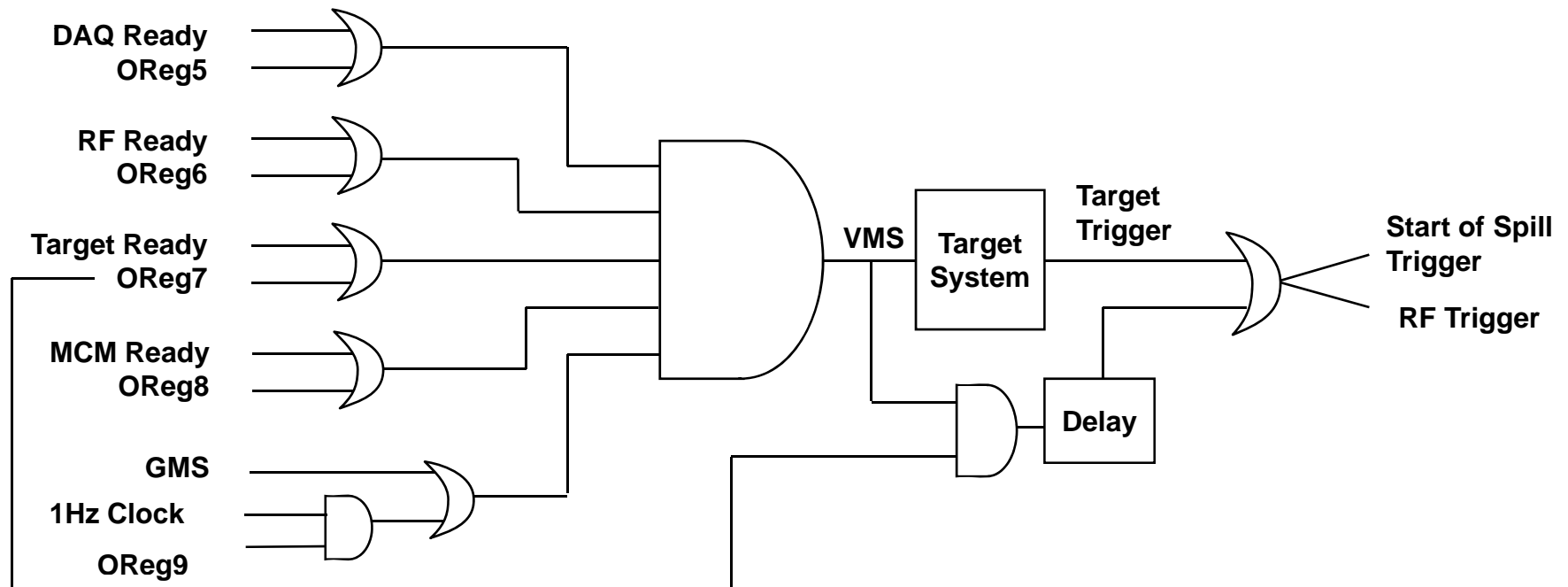


Trigger Hardware Overview



◆ DAQ Trigger

- No design change since CM 18
- DAQ trigger is issued as soon as every system is ready

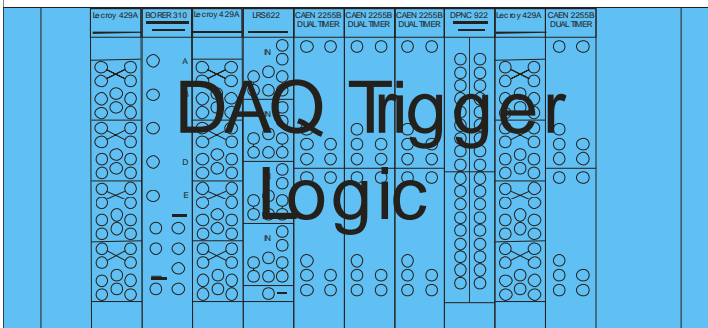


Reserved for RF & hall

Patch Panel 34 ch
Reserved for Target

Reserved for ISIS signals

Patch Panel 34 ch
Reserved for DAQ



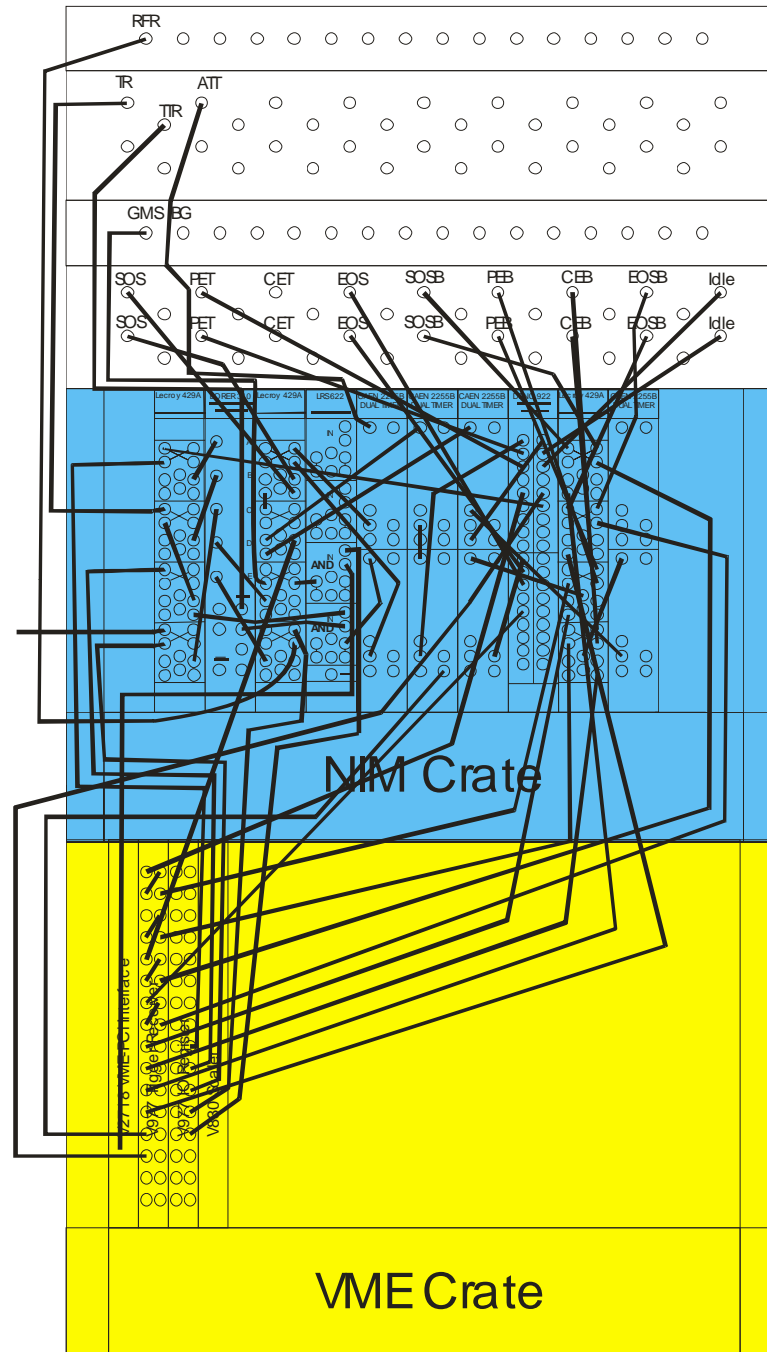
DAQ Trigger
Logic

NIM Crate

V2718 VME-PCi Interface
V977 Trigger Receiver
V977 IO Register
V830 Scaler

Central Trigger

VME Crate



NIM Units

- All in hand
 - 4 x Dual TIMER
 - 5 x Fan In/Fan Out
 - 1 x 5 fold Coincidence
 - 1 x Quad logic unit
 - 3 x Quad 8ch Fan-out

VME Units

- All in hand and at RAL
 - 2 x V977 I/O Register
 - 1 x 32 ch scaler

Patch Panels

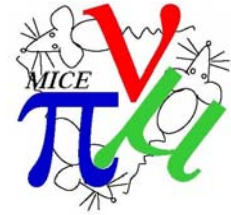
- All in hand and at RAL

Cables

- Collecting ...



Trigger Hardware Overview



◆ Particle Trigger

- Design updated since CM 18
 - TOF Horizontal and Vertical planes are used in OR
 - Downscaled TOF0 can be added in OR
 - Each trigger condition is sent into a dedicated TDC channel

Particle trigger request

Accepted Particle Trigger

Burst Gate

TOF0 (= TOF0_H OR TOF0_V)

TOF1 (= TOF1_H OR TOF1_V)

TOF2 (= TOF2_H OR TOF2_V)

Downscale TOF0

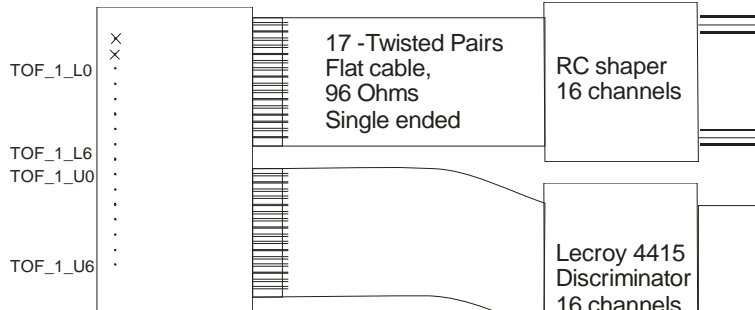
Downscale Burst Gate

■ TDC Channel Budget

- TOF: 108
- CKOV: 8
- Trigger: 8

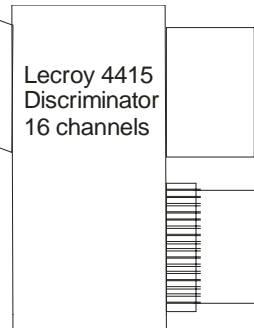
TOTAL: 124 -> Only 4 spares ! (Critical)

**LEFT
Pmts**

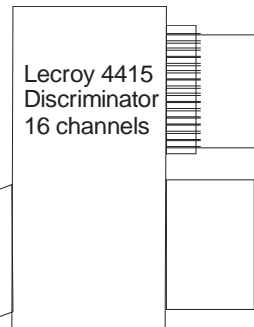


16 x ~6 ns
special cables
to Flash ADC

**UP and DOWN
Pmts are noW used
for the trigger**

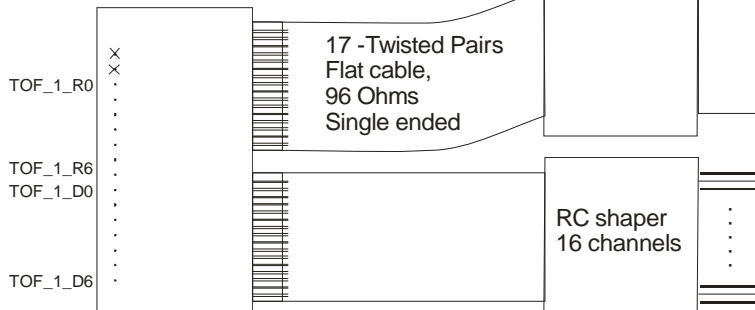


17 -Twisted Pairs
Flat cable
to Tdc 0: ch 0-15

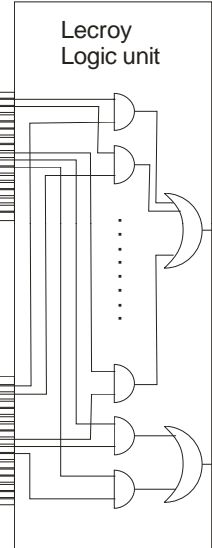


17 -Twisted Pairs
Flat cable,
96 Ohms
Single ended

**RIGHT
Pmts**



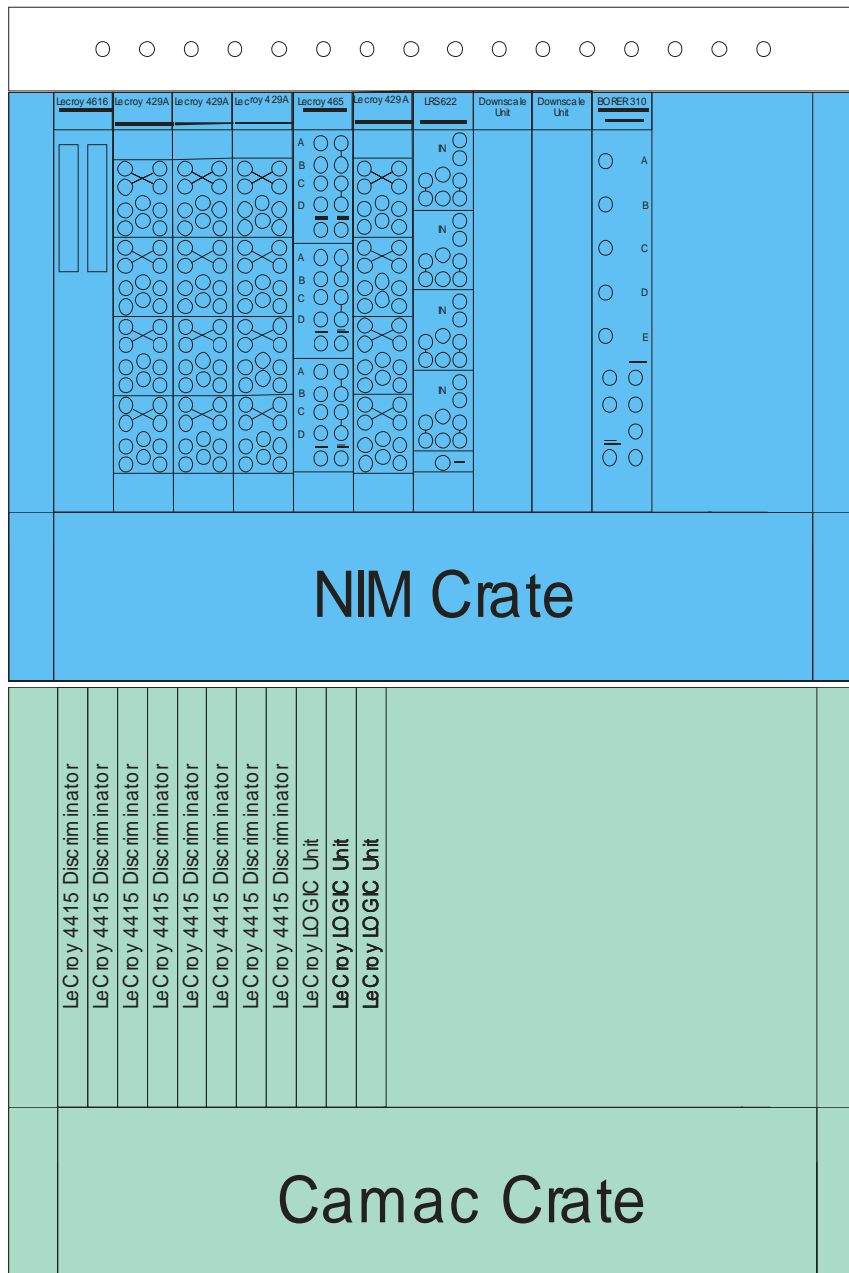
16 x ~6 ns
special cables
to Flash ADC



**OR of
Vert and Horiz
slabs**

NIM logic
from here

**2 by 2
coincidence**

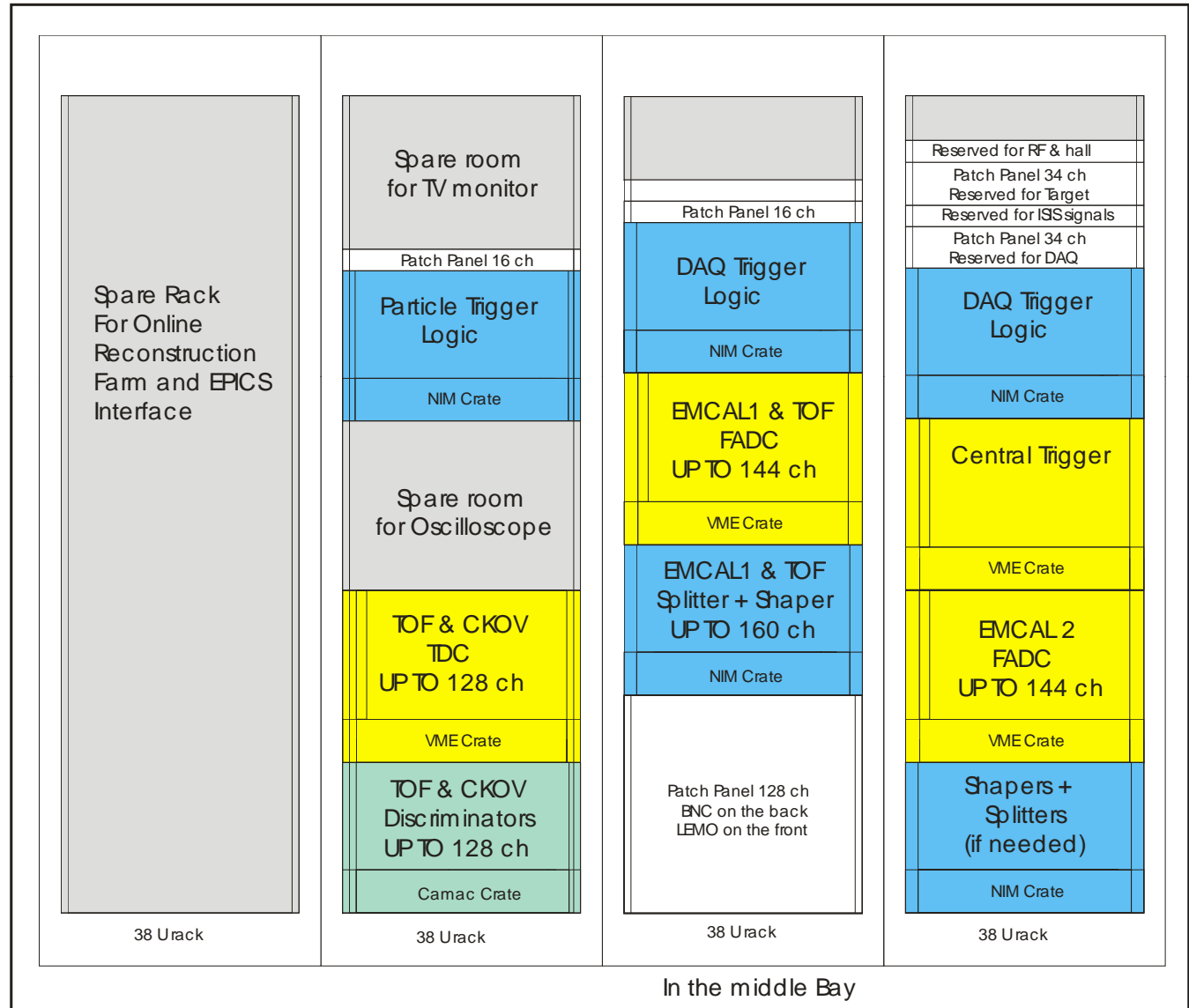
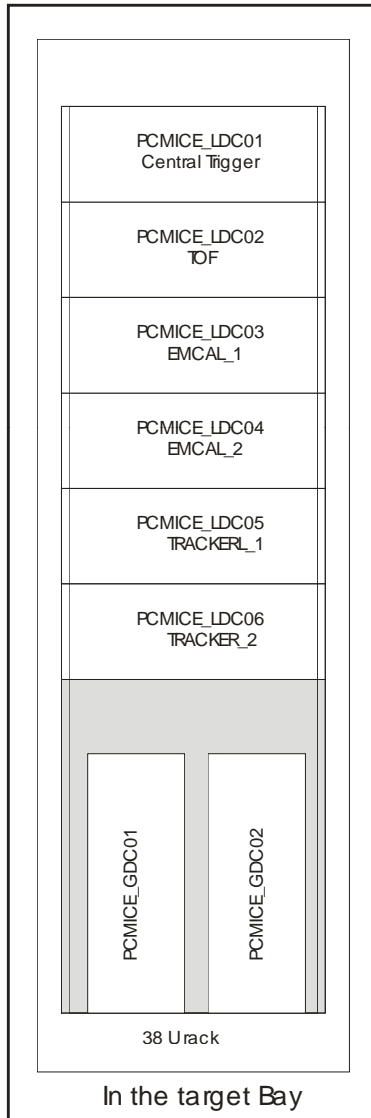


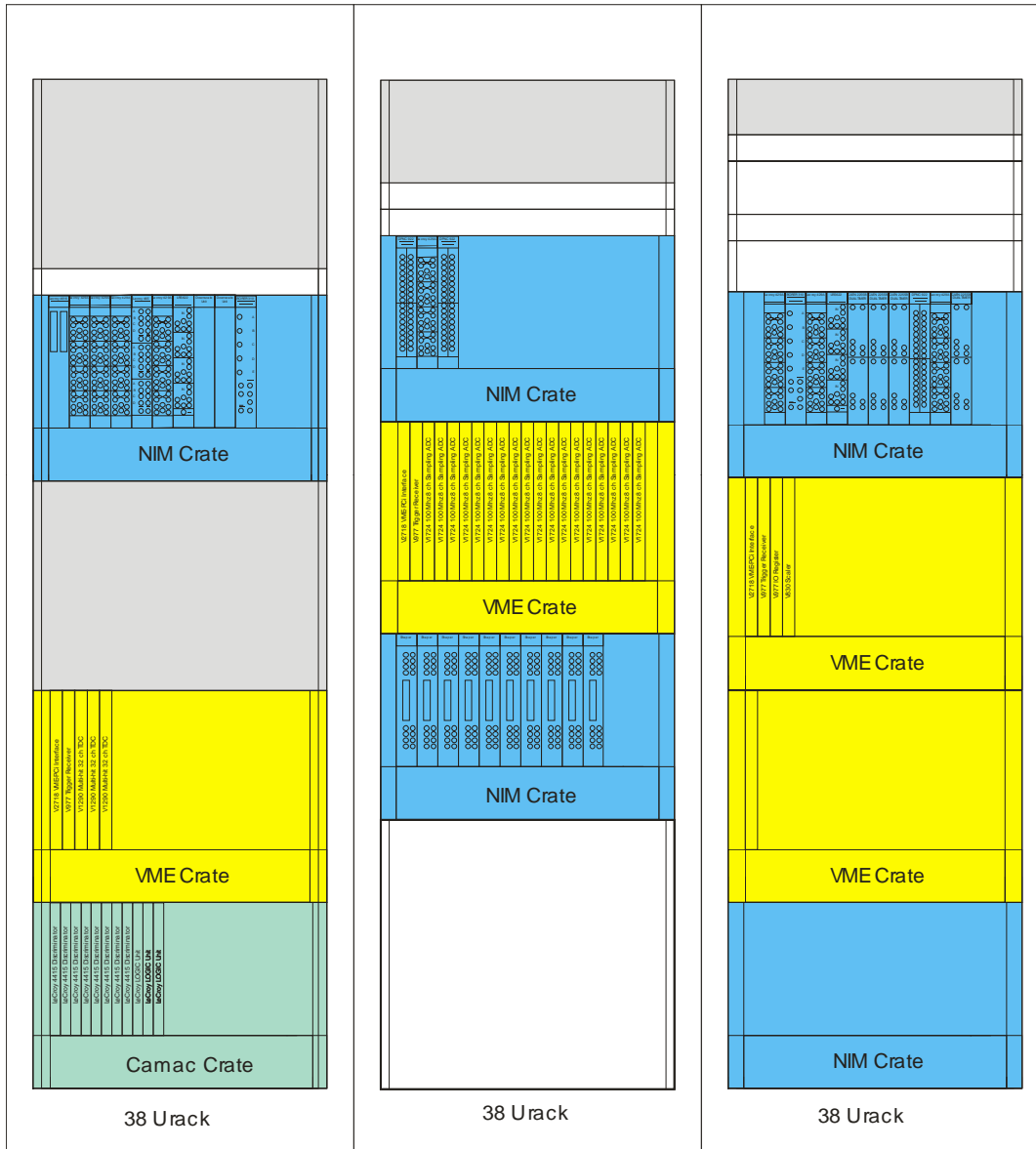
NIM Units

- Some missing
- 4 x Fan In/Fan Out
- 1 x 5 fold Coincidence
- 1 x triple logic unit
- 1 x Quad logic unit
- 1 x ECL-NIM-ECL
- 2 Downscale units

CAMAC Units

- Most in hand and being shipped
- 8 x Lecroy Discriminator
- 3 x Lecroy Logic unit
- (1 missing)





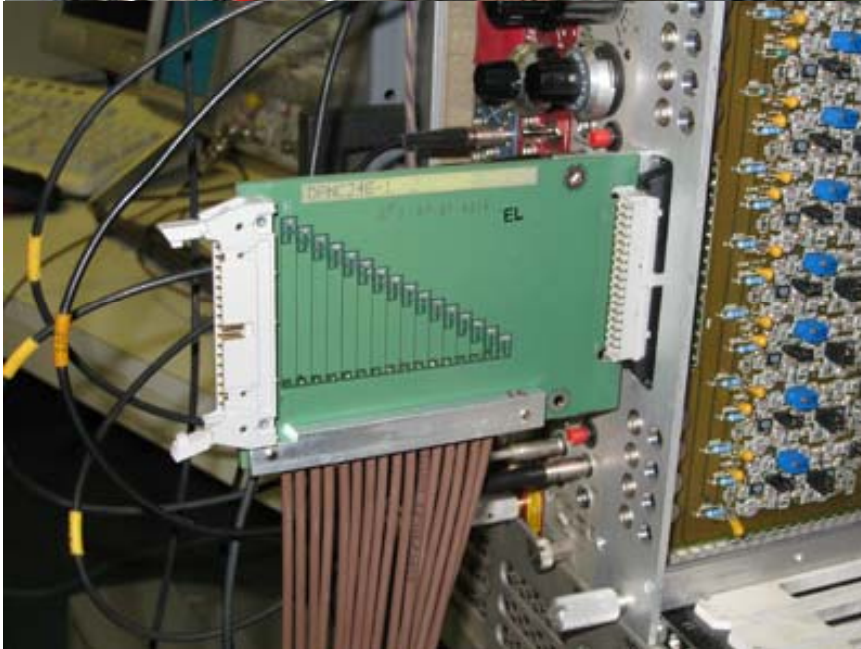
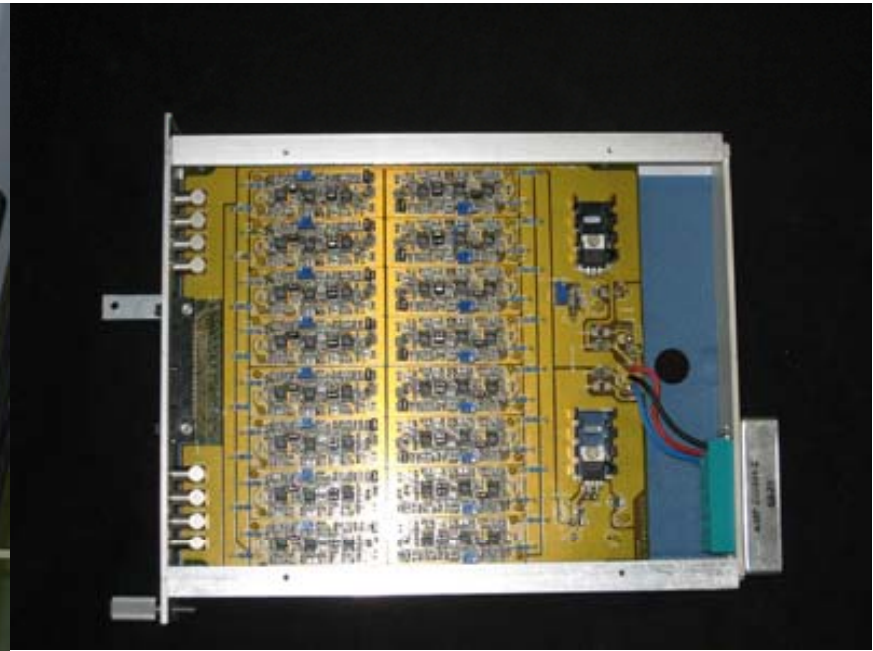
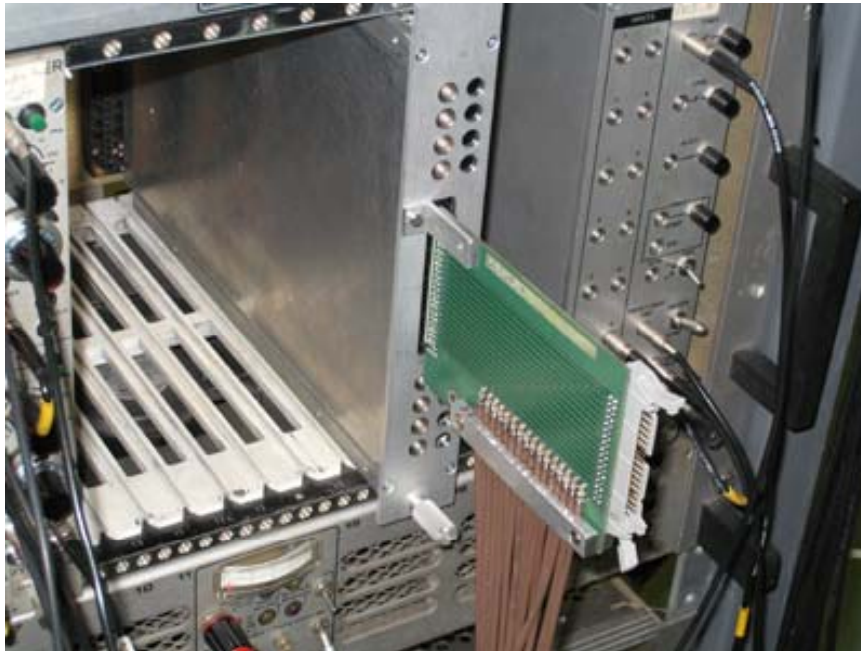
In the middle Bay

CAMAC Crate

- 1 available from RAL
- 1 spare in Geneva, will be shipped soon

NIM Crates

- 2 at RAL
- 2 available in Geneva, will be shipped soon
- Looking around for 2 more



TOF & EMCAL FEE

- Splitters
 - 8 available (128 ch)
 - 1 at RAL
 - 4 being shipped
- Shapers
 - 10 units available (160 ch)
 - 1 at RAL from Sofia
 - 3 being shipped from Gva
- Patch panel
 - Collecting...



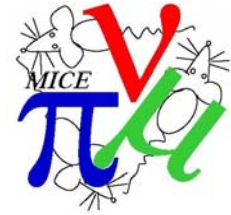
Schedule Milestones



- ◆ DDAQ Cosmic test: November 2007
- ◆ Shaper and Splitter Production + tests January 2008
- ◆ Trigger logic in VHDL Postponed
- ◆ DAQ review January 2008
 - External reviewer identified
 - Postponed due to lack of success of the cosmic test
 - Could happen in end of March
 - Discussing a joined review with the Software Project
- ◆ Single crate DAQ running in MLCR Wednesday
- ◆ Decision on electronics logbook End of next week
- ◆ All DAQ hardware in MLCR March 15 2008
- ◆ DAQ Trigger Depending on target
- ◆ Particle Trigger Depending on TOF



Summary



- ◆ Most of the DAQ hardware is in hand
- ◆ There is a technical design for
 - DAQ Trigger
 - Particle Trigger
- ◆ DAQ Rack layout is available
 - Might need an additional iteration
- ◆ FEE electronics for TOF and EMCAL is ready
 - Ludovico and Maurizio can send the TDCs and FADCs (and the Cables)