



Detector DAQ Hardware Status

Jean-Sebastien Graulich, Geneva

- o Introduction
- o Preliminary list
- o Plan for action
- o Summary



Introduction



- ◆ **What parameter list ?**
 - Identify the parameters that are recorded/controlled by the Control and Monitoring (CAM) system which have a potential effect on the physics data
 - Those parameters will have to be accessible during offline analysis to correct the data
- ◆ **Current model**
 - These parameters are added to the online Data stream so that the user doesn't have to access the EPICS archive
- ◆ **Significant work has been done a long time ago by Edda Gschwendtner and M.A. Cummings**

MACC's experimental controls channel list

what info source	how many channels	who determines
Beam diagnostics	-	Tilley/Drumm
Beam particle detectors		Gregoire
Tracker/ particle ID	-	Bross/Bonesini
Magnetic Fields	$12*(5+1+6+1+5)$	Rey/Guyot/Green
Alignment	A few - ISIS alignment system	Black/Linde
Cryo controls	-	Baynham
RF (V, phase, temp)	$2*4*2 + 8$	D. Li
Magnets (temps) currents	$3*10$ $3*2$	Green
Absorbers (temps, level, pressure)	$20 *3$	Cummings/Ishimoto

M.A. Cummings CM8 (2004)

What is Missing?

- ◆ Organisation & Coordination!

P. Drumm CM9 (2004)

Beam & Target

◆ CM Parameters

- For all magnets Qs(9), Ds(2), decay solenoid:
 - Current
 - Volts
 - Temperature, Cryogenics, Vacuum
- Target:
 - Insertion depth (read every 0.1ms to adapt drive currents and timing)
 - Insertion time
- Operational monitors:
 - 8 temperature measurements/cycle

Cooling Channel - Absorber

◆ CM parameters

- Temperature (Cryocooler, Absorber, temperature systems)
- Liquid level
- Buffer vacuum pressure
- Pressure at key points in H2 system
- Valve status in H2 system
- Heater currents

◆ CM parameters (from TRD)

- H2 gas system and He gas system
 - Pressure gauge (capacitance-type); 1 each
 - Pirani gauge; 1 each
- LH2 reservoir at 1st stage of Cryocooler
 - 2 Thermometers
 - 1 Level sensor (capacitance-type)
 - 2 Heater (1 for spare)
- Hydrogen absorber
 - 8 Thermometer
 - 1 Level sensor
- Absorber windows
 - 1 Thermometer
 - Heater; 1 each (to warm up)
- Safety windows
 - Thermometer; 1 each
- Absorber vacuum and Safety vacuum
 - Pressure gauge (capacitance type); 1 each
 - Pirani & cold cathode gauge; 1 each
 - Mass spectrometer; 1 each

Cooling Channel - RF Cavities (Virostek)

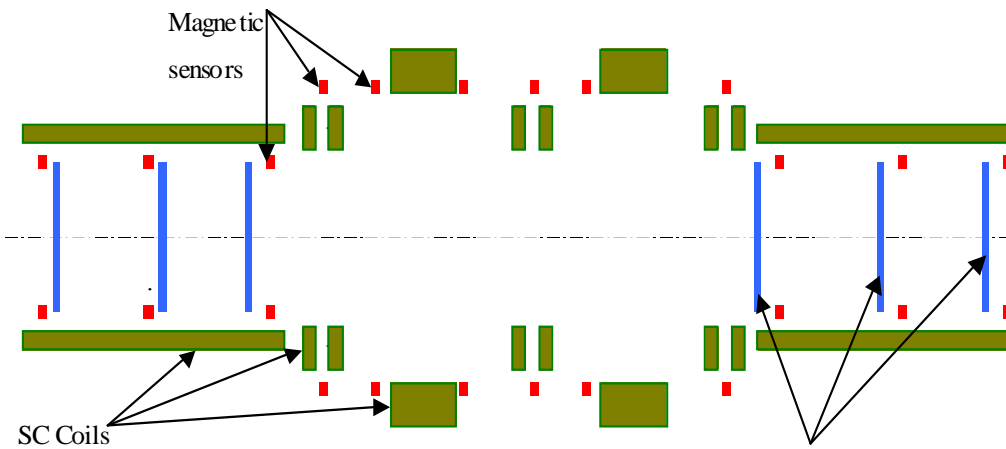
◆ CM parameters

- Cavity temperature
- Sensing loop signal from each of the 8 cavities
- Vacuum roughing pump control (2each)
- Vacuum roughing valve control and status (2each)
- Cryo pump ion gages (4 total)
- Vacuum manifold thermocouple and ion gages (4 each total)
- Vacuum vessel ion gages (2 per vessel, 4 total)
- Cavity ion gages (8total)
- Cryo pump compressor control (2 each)
- Gate valve control and status (4 each)
- Cavity body temperature thermocouple (2 per cavity, 16 total)
- Cavity cooling fluid temperature in (8 total)
- Cavity cooling fluid temperature out (8 total)
- Cavity cooling fluid pressure in (1 per cavity pair, 4 total)
- Cavity cooling fluid pressure out (1 per cavity pair, 4 total)
- Cavity cooling flow rate (8 total)
- Tuner hydraulic reservoir pressure (8 each)
- Tuner hydraulic reservoir pressure control (8 each) [feedback & control from cavity frequency]

Cooling Channel - Magnets

◆ CM parameters:

- Current in each individual supply
- Magnetic field at external probes (4 probes/coil)
- Temperatures (cryocooler and coil)



PID

- ◆ **CM parameters**
 - HV monitor 108 + 42 + 8 channels
 - HV current monitor
 - Hall temperature
 - MLCR temperature