

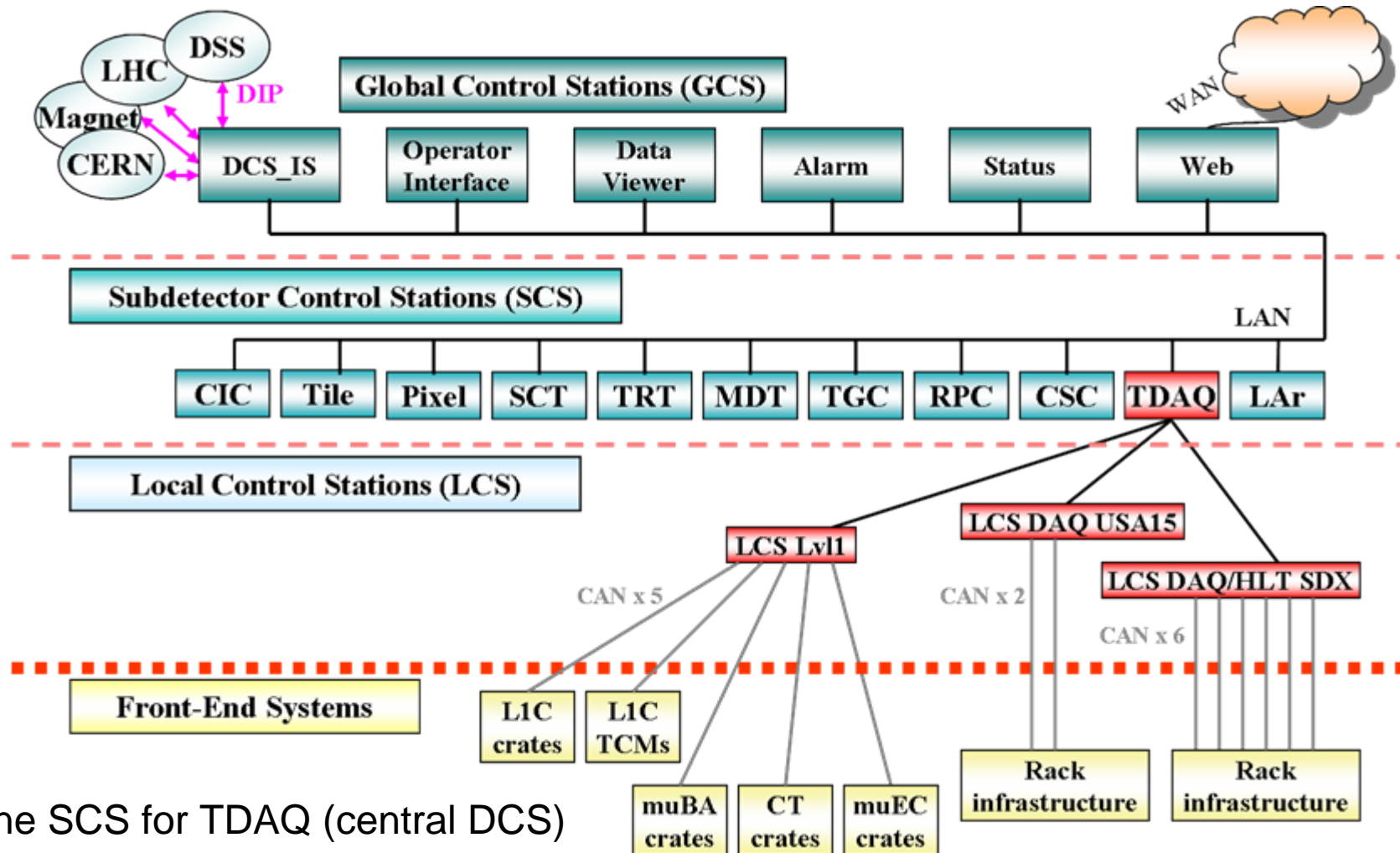
DCS for TDAQ

(from Lab to Point 1)

Y. Ermoline et al.

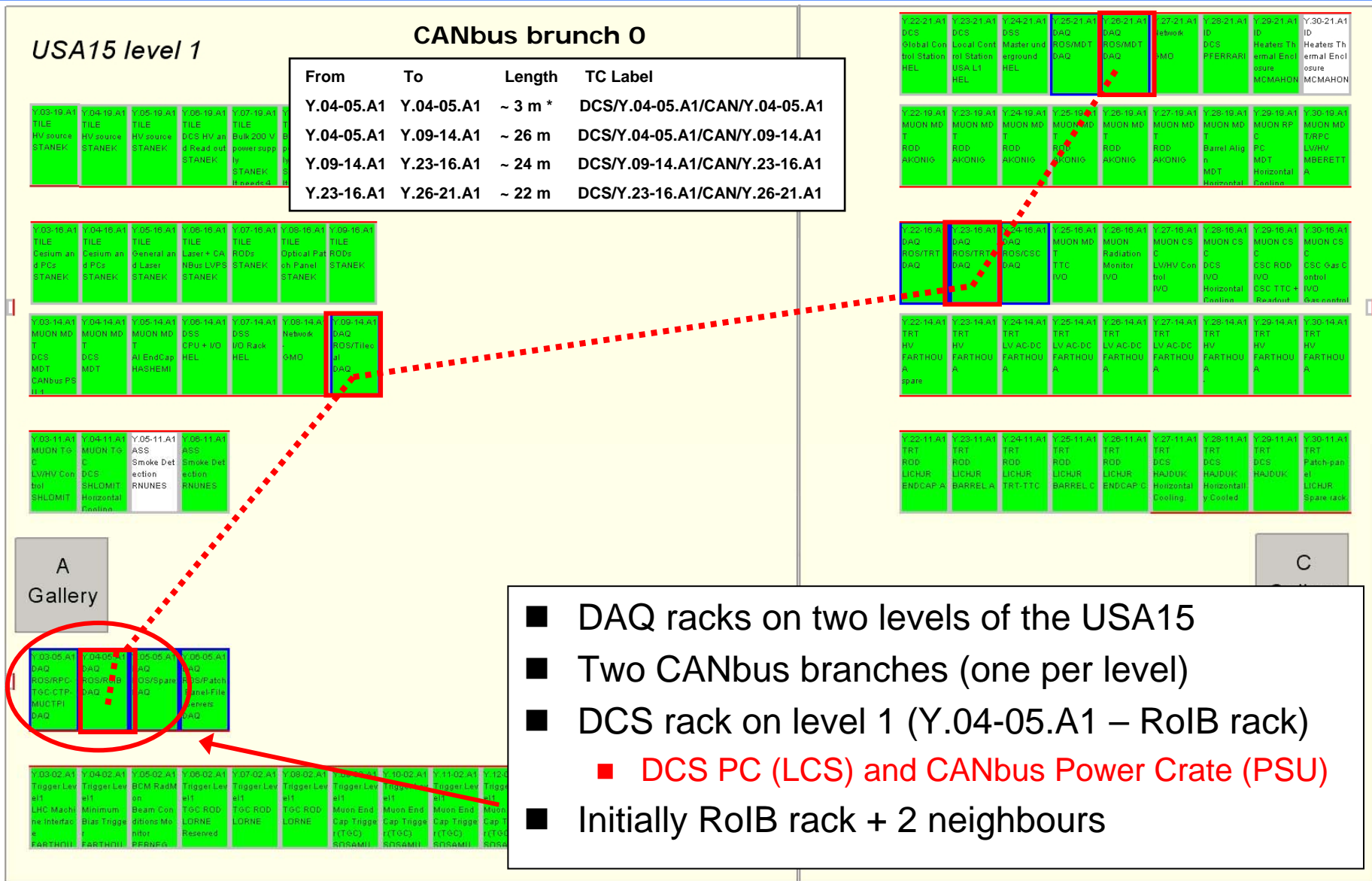
TDAQ Week – UCL London, 19 September 2006

DCS architecture in ATLAS



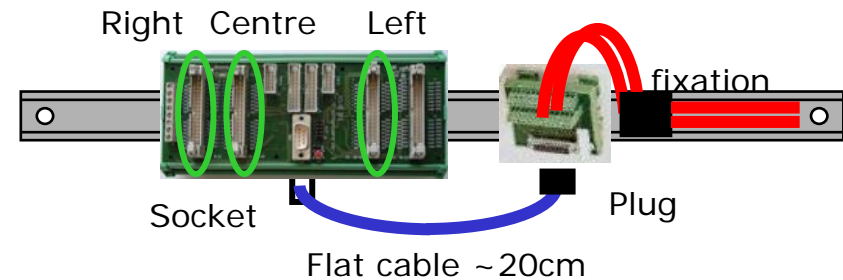
- One SCS for TDAQ (central DCS)
 - One LCS for LVL1 in USA15
 - One LCS for DAQ racks in USA15
 - One LCS for DAQ/HLT racks in SDX1

Rack DCS commissioning in USA15



Status of hardware components installation in USA15

- LCS - PCATLTDQLCS01 (2U) + Kvaser 3.3V PCIcan-Q card
 - Registered, installed, powered, networked, OS installed
- CANbus PSU (6U)
 - Delivered with 1 power module (2 CANbus branches), installed
- CANbus cables (4)
 - Ordered, connectorized (1), registartion/labelling requested
- ELMB + motherboard (MB) on metal plate + terminal block
 - Installed on DIN rail in upper 2U in the rack, on the left side
- Sensors (10 per rack)
 - Sensor allocation to ADC ch's
 - Adaptors installed in MB
 - Flat cable to rear doors
 - Terminal block on DIN rail
 - Wires/sensors on rear door



TDAQ racks sensors (reminder) & remote Reset

- What is monitored by DCS inside the racks:
 - Air temperature – 3 sensors (1 ADC ch/sensor)
 - ⇒ Quartz TF 25 NTC 10 kOhm, -35...+100 degrés C,
 - ⇒ 6*32 mm, 2m halogen free cable
 - Inlet/outlet water pipe temperature – 2 sensor (1 ADC ch/sensor)
 - ⇒ Same as for the air temperature measurement
 - Relative humidity – 1 sensor (1 ADC ch/sensor)
 - ⇒ Precon HS-2000V to monitor the dew point inside the rack
 - ⇒ In addition one temperature sensor (1 ADC ch/sensor)
 - Cooler's fan operation – 3 sensors (1 ADC ch/sensor)
 - ⇒ 3 fan rotation sensors (binary output) with built-in power supply
 - In total – 10 ADC channels per rack
- Reset signals for SBCs in RoIB and TTC crates in the the RoIB rack
 - External Reset input on the front panel of the SBC
 - 8 bit digital output port (PORT C) of ELMB to implement a remote Reset

PVSSII project in USA15 - 1

- PVSSII is the main DCS tool for ATLAS
 - The JCOP Framework is an integrated set of tools for developers
 - The ELMB JCOP Framework component provides functionality to configure ELMB and to readout it
 - In addition - ATLAS DCS and FSM Integration Guidelines
- Computer Management Framework (CMF) to install packages
 - NICE applications, PVSSII, Kvaser driver, OPC server
- Central network repository to download Framework components
- Windows Terminal Service
 - CERNTSATLDCS01 – Windows gateway to ATLAS DCS network
- USA15: distributed project ATLTDQLCS01
 - CANbus_0 – Name: “USA15_Level1“ (Kvaser Port 0 – PSU port A)
 - ELMB_1_0405 – ELMB in rack Y.04-05.A1
 - Analog Input Sensor: Sensor Type, Sensor Name, ELMB channel

PVSSII project in USA15 - 2

■ Set Alarms/Alerts: N of ranges, Alert Text, Limit Values, Alarm Class

Alerts ranges for AirTemperature

("Normal" temperature before cooler $T_N = 33^{\circ}\text{C}$)

Alerts ranges for PipeTemperatureInlet

("Normal" water pipe temperature $T_N = 15^{\circ}\text{C}$)

DEVICE_MODULE: fwAnalogDigital/fwAiConfigPanel.pnl dist_1:ELMB/USA15_Level1/ELMB_1_04...

Analog Input Configuration

Device Name: dist_1:ELMB/USA15_Level1/ELMB_1_0405/AI/Centre_AirTemperatureBottom

Description: dist_1:ELMB/USA15_Level1/ELMB_1_0405/AI/Centre_AirTemperatureBottom.

Address | DP func | Archive | Alarm | Smooth | Conversion | PV range | Units | Format

Alert Configuration

DP Element: dist_1:ELMB/USA15_Level1/ELMB_1_0405/AI/Centre_AirTemperatureBottom.value

Configure Ranges: 4

Alert Handling ON

Alert Text	Limit Values	Alarm Class
TOO HOT	< 55.00	_fwFatalNack
HOT	< 45.00	_fwErrorNack
WARM	< 35.00	_fwWarningNack
OK		

Apply

Close

DEVICE_MODULE: fwAnalogDigital/fwAiConfigPanel.pnl dist_1:ELMB/USA15_Level1/ELMB_1_04...

Analog Input Configuration

Device Name: dist_1:ELMB/USA15_Level1/ELMB_1_0405/AI/Centre_PipeTemperatureInlet

Description: dist_1:ELMB/USA15_Level1/ELMB_1_0405/AI/Centre_PipeTemperatureInlet.

Address | DP func | Archive | Alarm | Smooth | Conversion | PV range | Units | Format

Alert Configuration

DP Element: dist_1:ELMB/USA15_Level1/ELMB_1_0405/AI/Centre_PipeTemperatureInlet.value

Configure Ranges: 5

Alert Handling ON

Alert Text	Limit Values	Alarm Class
HOT	< 19.00	_fwErrorNack
WARM	< 17.00	_fwWarningNack
OK	< 13.00	
COOL	< 11.00	_fwWarningNack
COLD		_fwErrorNack

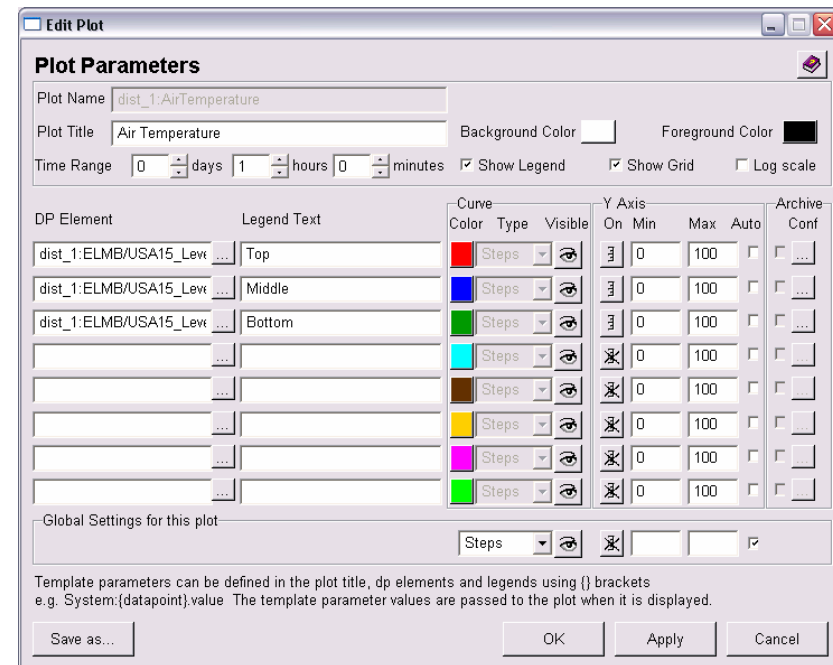
Apply

Close

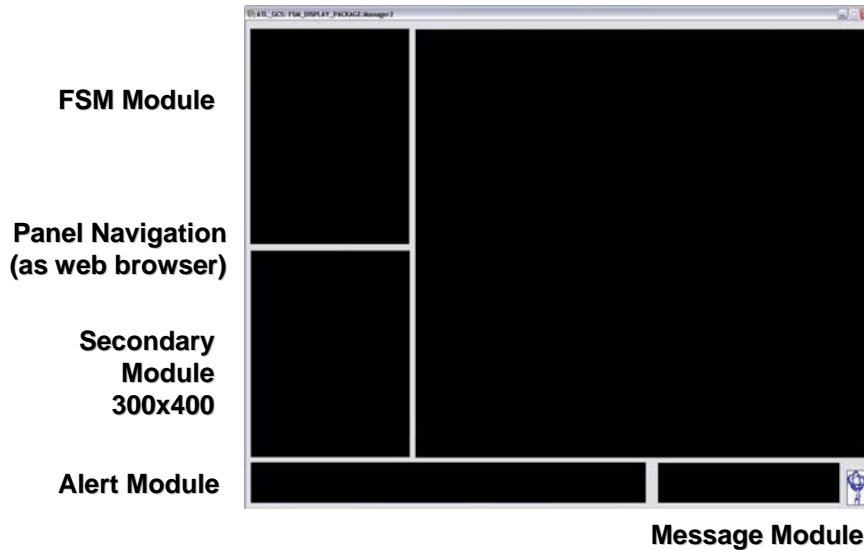
Rack panel prototype



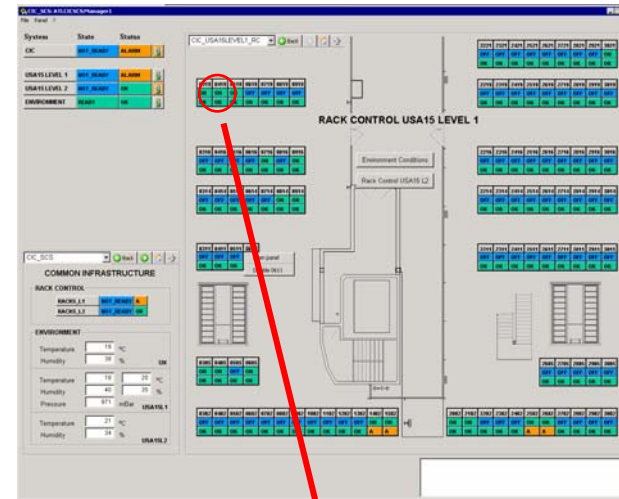
- Rack panel provides access to sensors values and trending plots (per group of sensors)



Operator interface in USA15 (H. Burckhart, ATLAS Week)



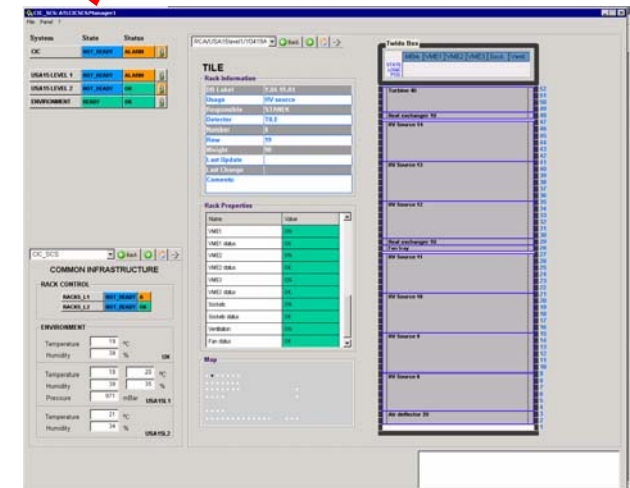
Main Module 900x860



CIC: Racks USA15 L1

■ Subdetector integration:

- Define FSM hierarchy
- Supply panels for operator interface
- Define alerts (**real ones!**) for alarm screen
- Archive data in ORACLE and send to COOL
- Create Web page(s)



Rack 0419

Further steps

- DCS hardware commissioning in USA15 and SDX1
 - Planning, ordering, registration, labeling, installation...
- Implement subdetector integration requirement
 - Configurable (from DB) rack panel
 - ⇒ DB of rack parameters
 - Rack FSM Device Unit & LCS Control Unit
 - ⇒ Instances of DAQ/HLT racks
 - Archiving...