The DCS for the 2006 Run

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Outline:

- Reasons to build a new DCS project
- New packages used
- Equipments/parameters to control/monitor
- The archived DCS data 2002 – 2004
- What is new in the new DCS
- Graphical User Interface
- Alerts scheme
- Options for CAEN HV controls
- New requests for integration of detectors/equipments

Motivation

- DCS is "transversal" w.r.t. the COMPASS detectors, DAQ, PT and SPS info
- Important to ensure good running conditions of the experiment, and the good stability and quality of data taking
- Must provide clear indication of alarms, in such way that the shift crew will react at the shortest delay
- Must provide settings and On/Off capabilities for equipments like HV, LV, etc

  ↪ guarantee easy but protected access
- Must provide monitoring tools (e.g. trendings) easy to use by non-experts
- Must provide archiving capabilities for the relevant monitored parameters

Why a new DCS for COMPASS

- The old version of PVSS suffered from several problems of performance, reliability, graphical interface limitations, etc.
- The new version of **PVSS II**, v.3.0, was released in August 2004, including new features and offering more reliability.

  ↪ We would like to profit from these!

The 2005 SPS shutdown provided the oportunity to redesign the system, at the same time as we update the packages used, and some of the front-end hard and software.

The knowledge of PVSS at CERN and inside the group is increasing
The tools developed at CERN to work with PVSS are also improving (**JCOP-Framework**, **DIM**, **SLiC**, and the evolution of **OPC Servers**)

We are learning together (DCS-COMPASS, IT-CO and the JCOP group, ETM Company, and companies like CAEN and Wiener)

Past DCS data (2002 – 2004) I

Some monitored values (V, I, temps, ...) are archived – may be of interest for offline studies on the stability of the detectors, and even for physics analysis.

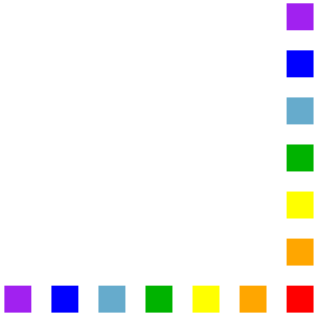
Past data can be accessed outside PVSS in the form of Root tree files.

Will **soon** be stored in the CASTOR file system, under onl account: /castor/cern.ch/user/o/onl/dcs/...

- 2003
- 2004
  - ↪ BMS
  - ↪ GEM
    - HV
    - Central
    - LV
    - Gas
  - ↪ ...

Past DCS data (2002 – 2004) II

- For each archived parameter, value + timestamp are given
- Time is stored in seconds, using TDatime function
- An example for histogramming in Root will be included



New packages used I

PVSS II v.2.12 → PVSS II v.3.0

Advantages:

- Lighter and faster at start-up
- New Linux graphical user interface (including a console panel allowing to see the state of PVSS related processes)
- More capabilities to work with external databases (Oracle, mySQL,...)
- Filtering of repeated alerts, to prevent PVSS overload

Disadvantages:

- Not yet fully debugged
- Discard alerts if too many of the same. Needs intelligent filtering – this is being checked

New packages used II

New JCOP-Framework – incompatible with previously used version

↪ strongest reason to rebuild the DCS project

JCOP-Framework is a CERN software designed for the LHC experiments

↪ COMPASS has no influence in the decisions, and cannot prevent future backward-incompatible modifications

It provides:

- datapoint types (i.e. a kind of templates) ready to use for CAEN HV, ELMB analog channels, etc – simplifi es a lot our work!
- default panels for standard equipment – we can use them by just introducing slight modifi cations.
- tool for trendings – more user-friendly than the PVSS embedded one
- coherent scheme for alarms treatment

New packages used III

- new SLiC for CAEN HV

  $\hookrightarrow$ is being adapted by IT/CO, to work with the new JCOP-Framework – official (but limited) support from IT

- new OPC Servers for Wiener LV and Fan-trays, for ISEG HV, and for ELMBs

  $\hookrightarrow$ Wiener and ISEG OPCs are standard commercial solutions now available (IT/CO and the equip.s companies provide support) – need to be tested.

  $\hookrightarrow$ ELMBs and their software developed by ATLAS. We will use new version (ELMB v.128) – support given by ATLAS

- SMI++ – Final State Machine Server + Client

Equipments/parameters to control/monitor

These are basically the same as in 2004, with some improvements:

- CAEN crates SY127, SY403, SY527 and SY1527

  $\hookrightarrow$ $\approx$ 1200 HV channels, some LV channels

- ISEG HV crates/boards

  $\hookrightarrow$ $\approx$ 360 HV channels

- Wiener LV PS and $\approx$ 20 Wiener fan-trays for VME crates

- $\approx$ 200 analog channels (read using ELMBs)

  $\hookrightarrow$ temperatures, magnet currents, humidities, LV, atmospheric pressure, and few alarms

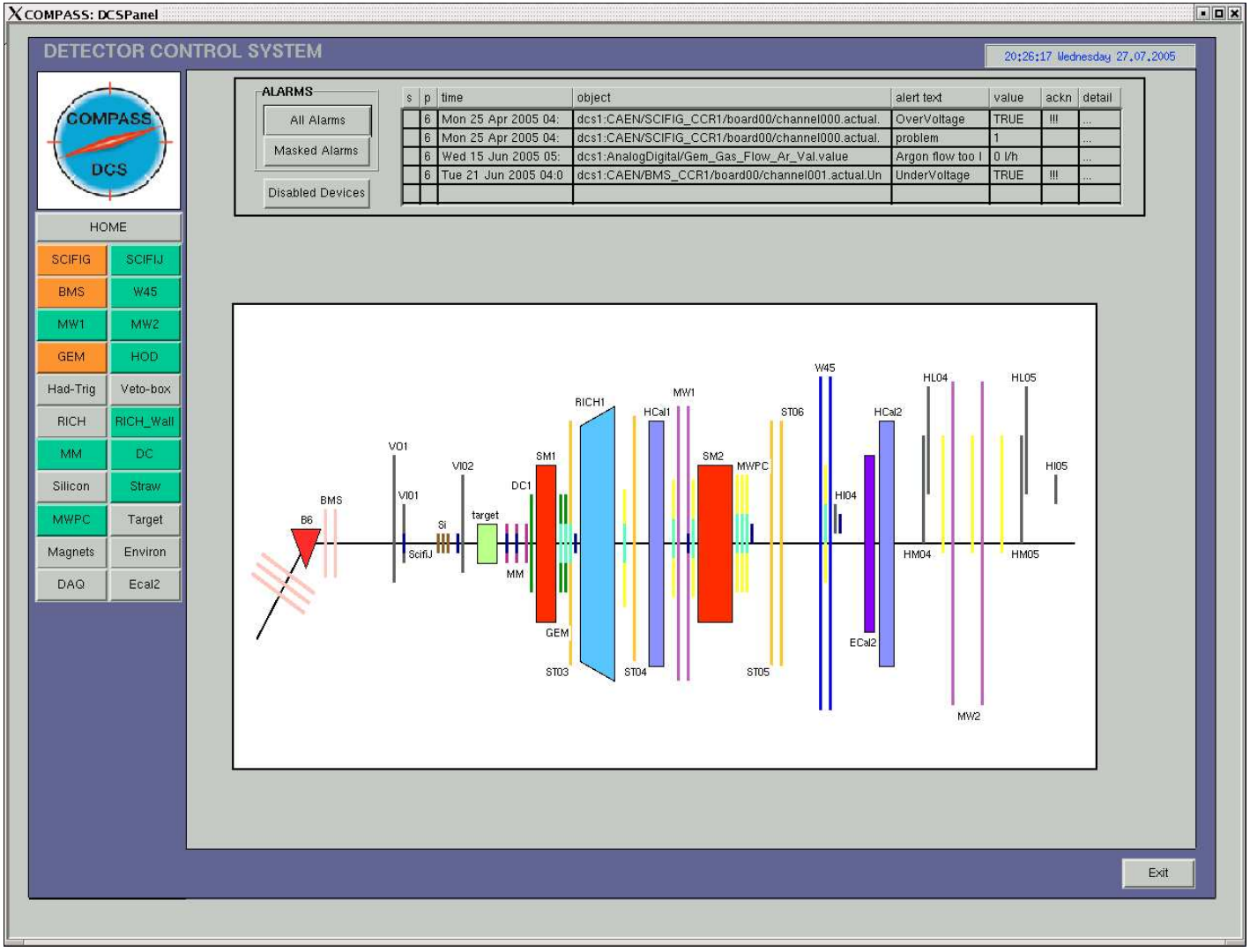
- Gas mixtures of $\approx$ 10 detectors

  $\hookrightarrow$ reading information from 3 PLCs

$\rightarrow$ Up to now there were **no requests** to integrate new equipments (except for the new SciFi-Poland)

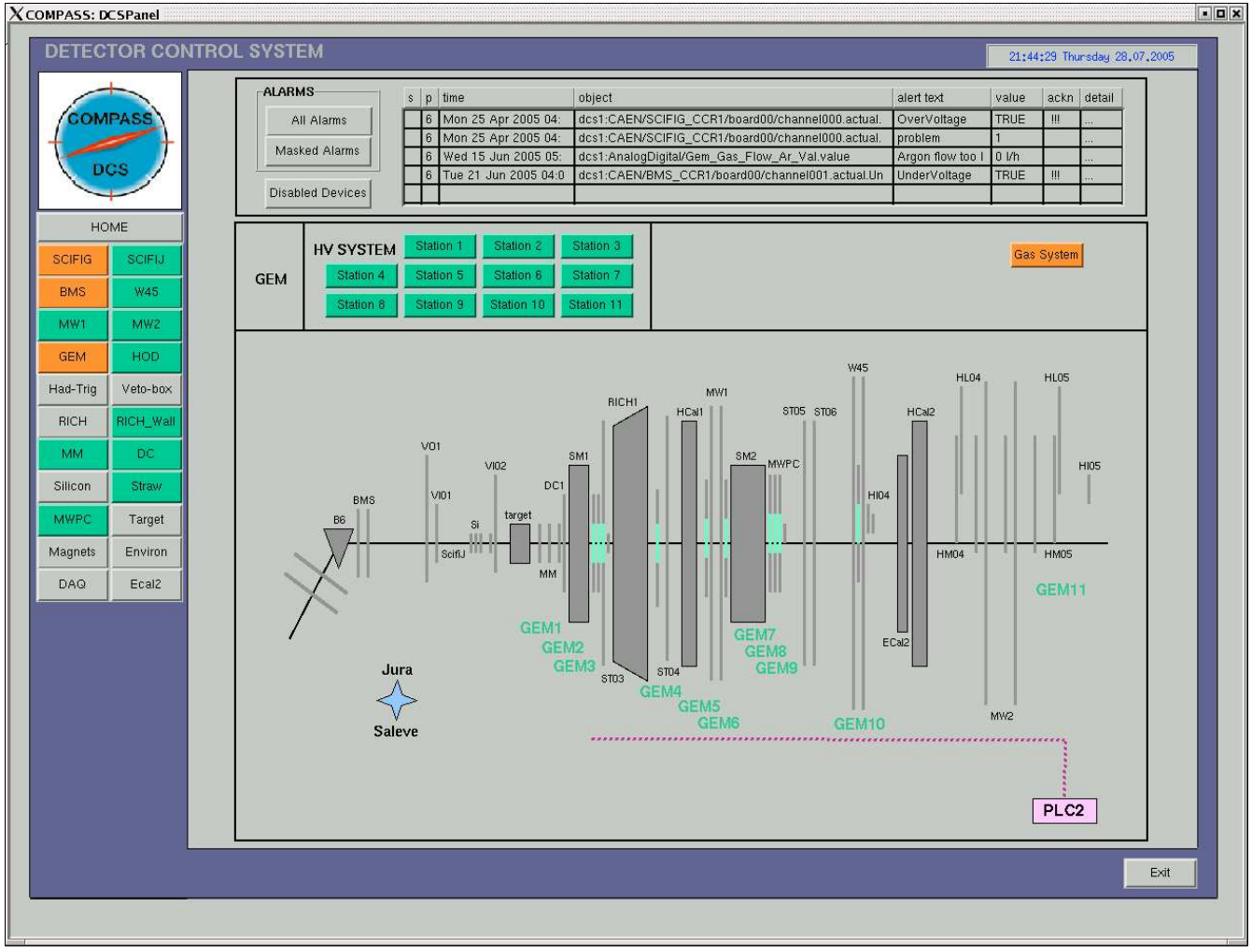
What is new I

→ New "operator" and "detector-expert" panels



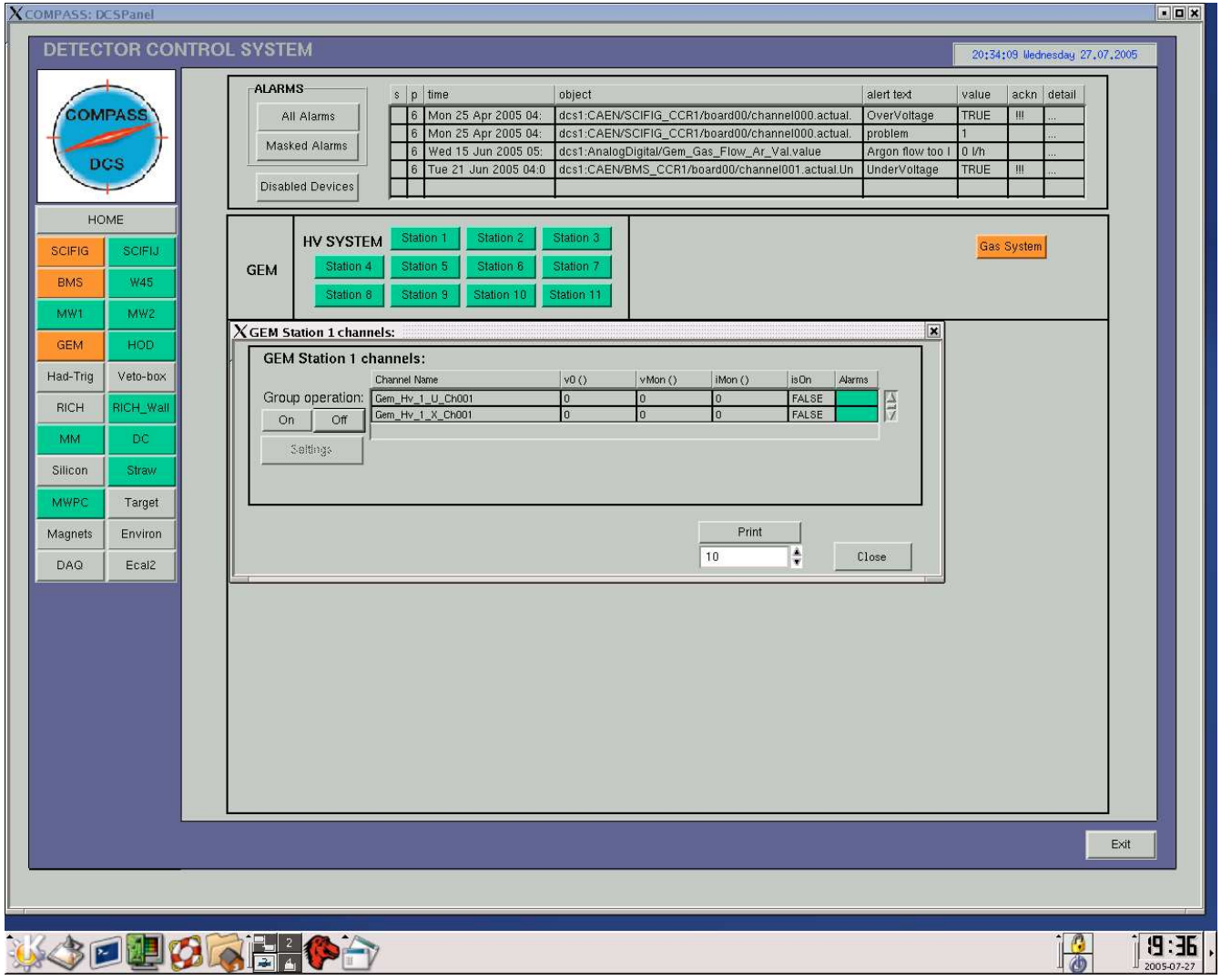
What is new II

→ Detector oriented – as opposed to hardware (or front-end) oriented



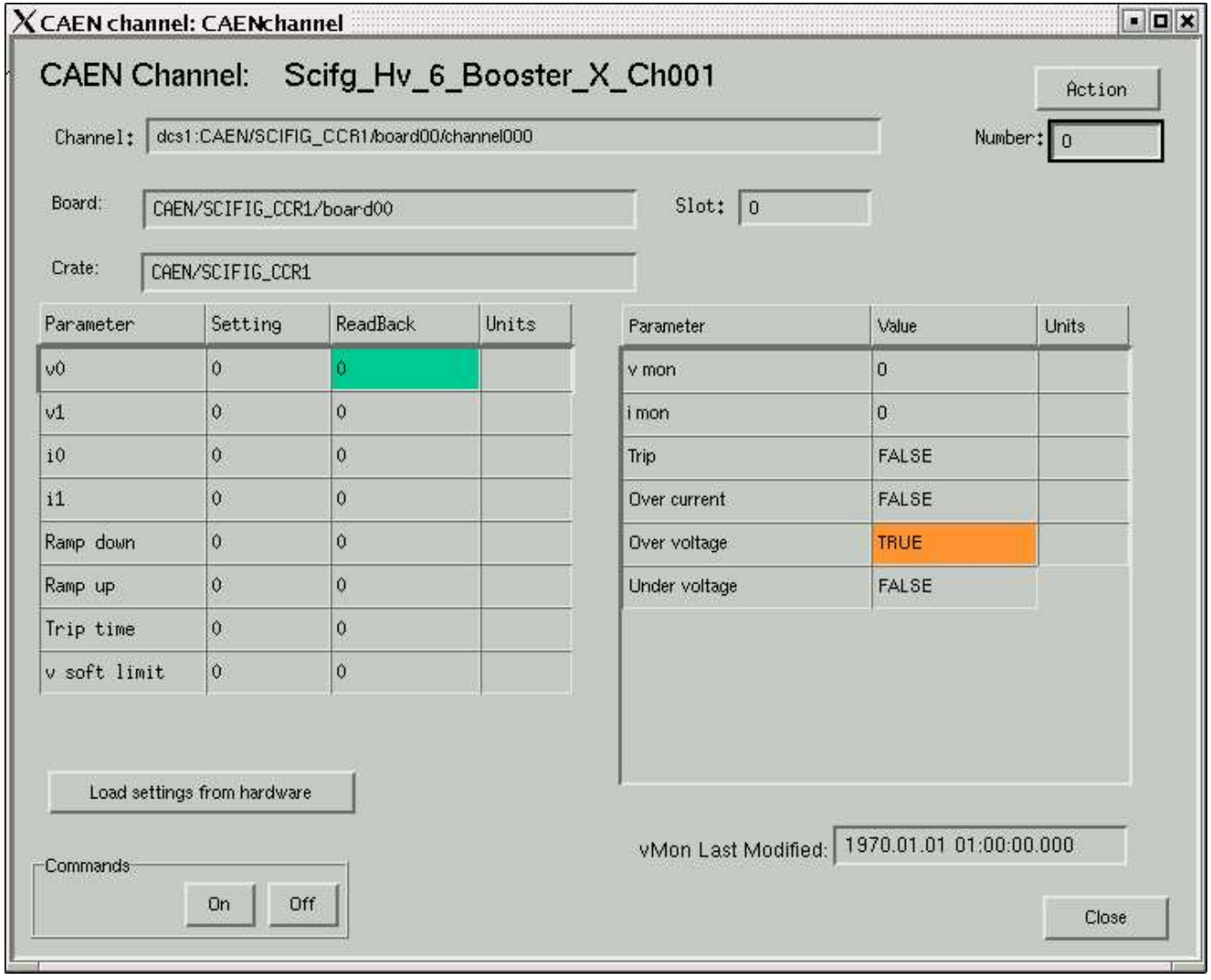
What is new III

→ "Settings" require a "detector-expert" login.



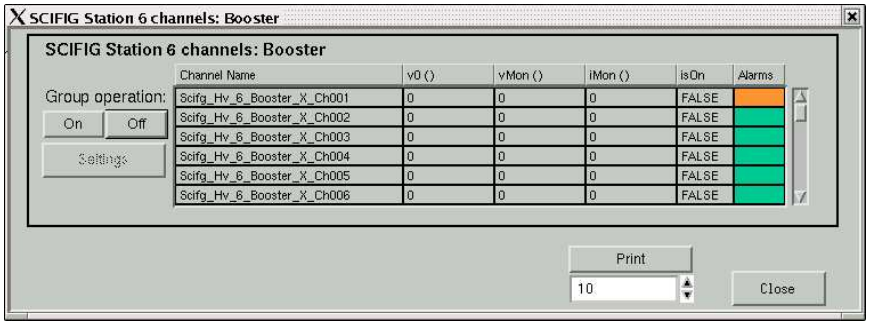
What is new IV

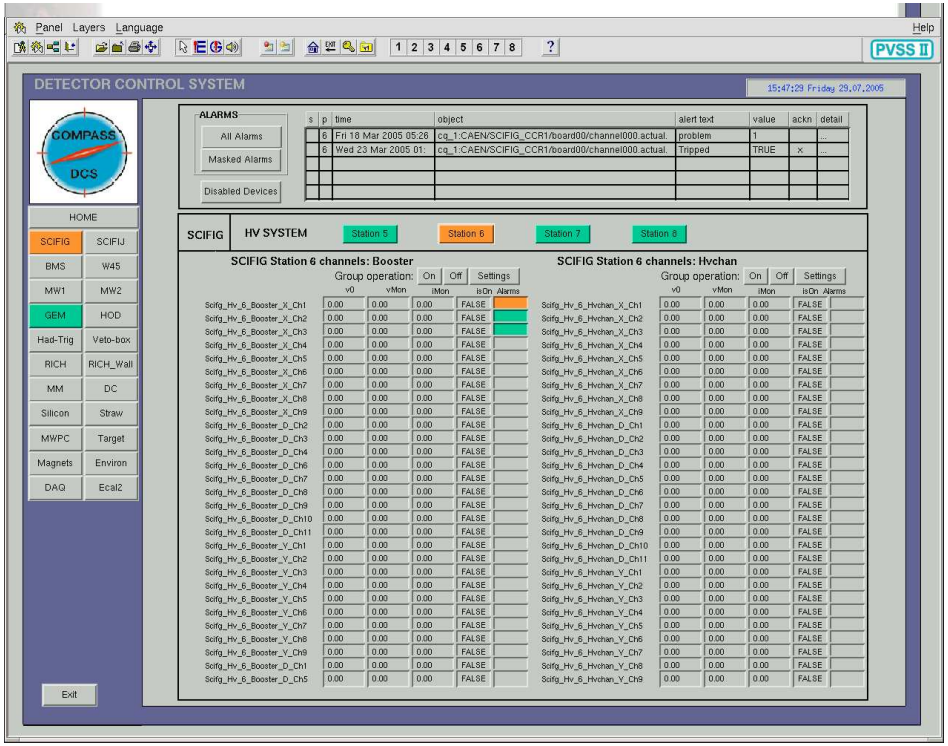
→ All details about a specific channel visible in a pop-up window



Graphical User Interface

The Linux GUI is improved. But some bugs are still present. One of these delayed seriously the redesign of the project.





Alerts scheme

Alerts are shown through the background color of "values cells".

The JCOP-Framework code of alert colors is used, with a few modifications:

- error in the programming
- no "alert handling" defined
- masked alarm
- OK, No alarm
- warning alarm
- fatal alarm
- no connection to hardware. Unknown state.

CAEN HV options I

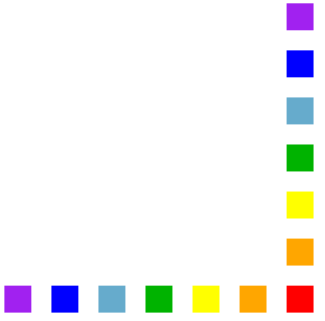
3 main options for CAEN HV controls:

- SLiC + DIM
  - ↪ Can run either in Linux or Windows. We choose SCL3 Linux.
  - ↪ Is similar to what we were using in the past.
  - ↪ SLiC requires some modifications to be compatible with the new supervisory packages.
- SLiC compiled as OPC Server
  - ↪ Must run in Windows PCs.
  - ↪ Never tested.
  - ↪ SLiC requires some modifications.
  - ↪ SLiC package concerning OPC protocol is not optimized, thus expected performance is lower. An optimization would be very time consumming (cf. IT/CO)

CAEN HV options II

- CAEN OPC Server
  - ↪ Must run in Windows PCs.
  - ↪ Not debugged for crate types other than SY1527/2527.
  - ↪ Preliminary tests done at COMPASS (with SY527 crates) show poor performance ($\approx$ 30 seconds needed to read 24 channels)

Even if we don't have the results of all tests, we decided we will proceed with the first option – SLiC + DIM.



New requests

Requests to integrate new equipments in the DCS for the 2006 Run should be made as soon as possible.

Requests can be submitted via the web:
http://compass-dcs.web.cern.ch