# THE COMMISSIONING OF THE CONTROL SYSTEM OF ACCELERATORS AND BEAMLINES AT ALBA SYNCHROTRON

March 8th-June 10th 2011… October 18th 2011

The control system

The infrastructure implicated in controls includes more than 350 racks, 6300 equipments and 17000 cables. The controls architecture is highly distributed, comprising about 2500 network devices. The central Tango Installation for the Control and data acquisition of the accelerators has today 5680 devices and 1480 processes running.
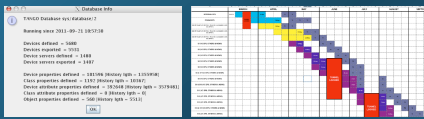
Each Beamline has an independent Tango installation, controls hardware and disk space in the central storage. The networks between machine controls and Beamline controls are separated, having a firewall in between. Thus the interfaces between Machine and Beamlines are implemented via virtual machines acting as gateways, and PLC direct connections.

ccdb: The cabling database

•Having a consistent and up-to-date central repository of the equipments and cables for the control system opens many new possibilities from the installation and operation point of view. During the pre-installation phase, the equipments were assembled, mounted and tested in the warehouse, and the record of those tests was kept in the database. Also valuable information like MAC addresses, IP addresses, boot servers, etc. was added during this phase. This made possible to create from the cabling database, configuration files for several network services, such as DNS, DHCP, Radius
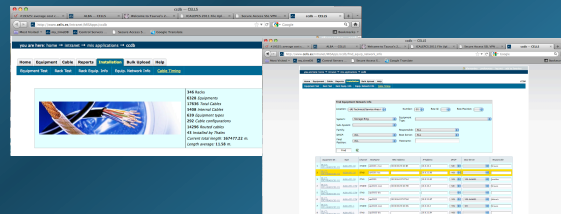


RT, Timedb, and other management tools

•RT (Best Practical Solutions LCC), has been intensively used in the computing division. It is a great tool for implementing ITIL [7] practices.

•Projects are managed following the PRINCE2 methodologyq, and assisted by the Computing Project Management tool, another application developed by the Management Information System group (MIS), and extensively used by the entire Computing division.

•Times spent in projects, services and others are gathered in the timeDB.
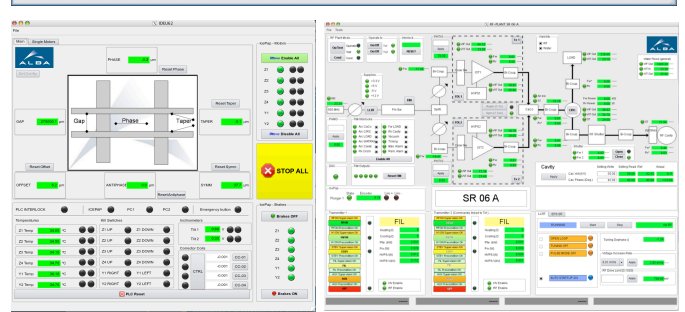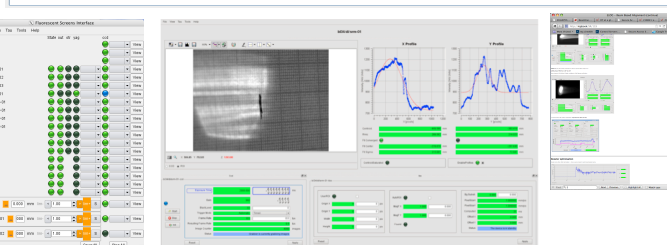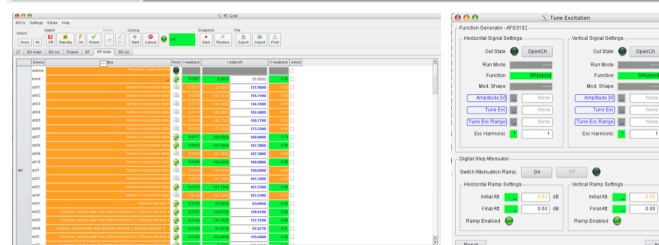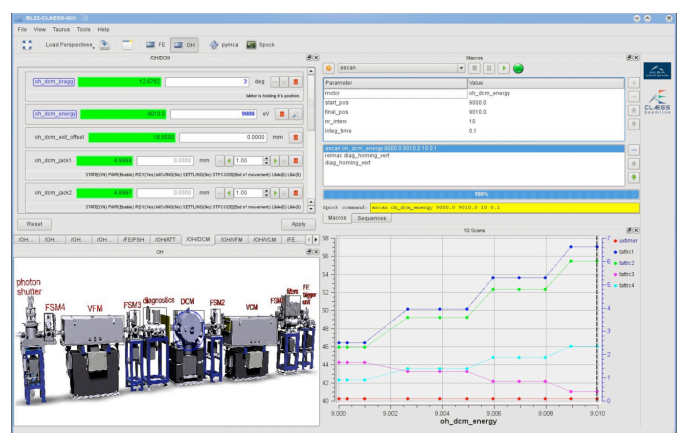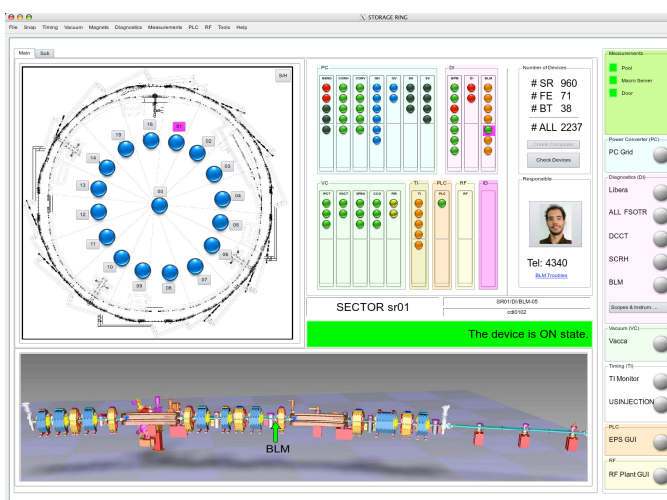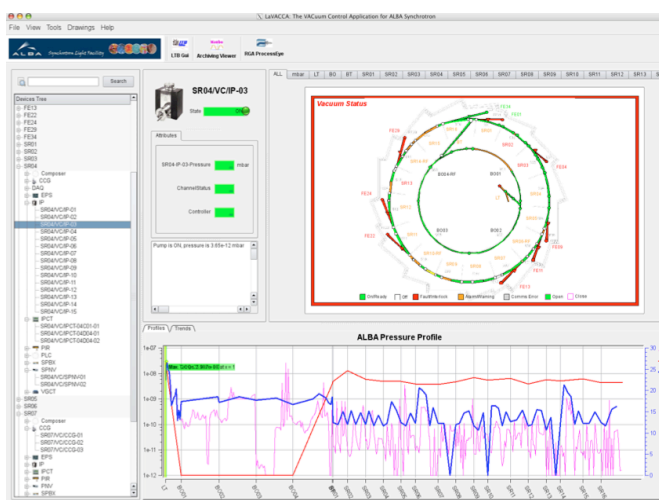
Conclusions

The commissioning of the control system is always tricky, because it is the last one before the commissioning of the accelerators, and it has dependencies with all the predecessors, hardware installation, equipments, fluids, sensors, cables, etc
Having a pre-installation campaign was crucial for speeding up the final installation. Most racks were preinstalled in 2007 and 2008, including equipments and internal cables, which resulted in a significant workload advanced in time.
The management tools, in particular the cabling database was crucial for maintaining the consistency and reducing the tests and early maintenance costs.
During the installation, there were quite a few "routine" operations, like Factory and Site acceptance tests of equipments, which had an important impact in the final workforce for development and commissioning.

Contributions

Many people have worked in this project. This is a work achieved with the effort of the whole computing division. The complete controls, electronics, network system administration groups actively participated in the design, installation and tests of the control system. Among them, the persons in charge of the network, M. Díaz, R. Escriba, had an important role. Furthermore, the help of the Management Information System group, in particular, O. Sánchez, I. Costa, A. Nardella, A. Klora, D. Salvat and V. Prat, who developed and maintained the cabling database, the TimeDB and the Project Management system has been crucial.

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