WHAT IS REVOLUTION

Not a political revolution ……………………… Not an artistic revolution

REVOLUTION is the acronym of

REconsider VARIOUS controLLers for your motion

Review of the current motion control system

Hardware

Flexible and modular hardware architecture

BASED on standardized products and industrial technologies and OPEN to other technologies (piezo, sin/cos, etc.)

Standard products and technologies:
- Motor: stepper motor 4 phase, Brushless and DC
- Encoder: incremental quad, SSI, analog, resolver (servo)
- Cables and connectors are clearly defined
- ControlBox integrates a Galil[1] DMC2182 – 8 axis controller
- DriverBox integrates Mid-Engineer[2], power boards (stepper)
- VacuumBox integrates Phytron[3], power boards (stepper in vacuum)
- ServoBox integrates power boards for servomotor developed by SOLEIL and based on Elmo[4] component

Software

Multilayer processing

Motion processes are closer to the hardware in the firmware and the microcode. User Tango devices (GalilAxis, GalilSist) have a short and simple interface. The device (ControllerBox) manages data exchange.

Dedicated microcodes meet the needs of specific applications (phase loop RF, collision avoidance, safety equipment, etc.). Users access via device MicrocodeDataViewer

Results

Extensive, relatively homogeneous installed base of motion controllers

1534 axes: 1197 standard steppers
107 non standard supported axes
244 fully non standard axes

Controllers: 220 ControlBox
37 fully non standard controller

Standard systems represent 84% of total
Non-standard axes are used for magnetic insertion devices, diffractometers and hexapods.

Figures from May 2011

Satisfactory quality

- Initial objectives achieved
- Motion systems efficient and reliable
- Cost controlled
- Performance sufficient for almost all applications

But we must prepare for the future TODAY

Prospect of a new system

Reasons

SOLEIL needs to upgrade
- Risk of obsolescence of our current controller
- New complex applications demand higher performance

MAX IV needs to
- Define an up-to-date motion system
- Select a controller

Guidelines

Similar requirements
- RELIABLE
- FLEXIBLE
- HIGH PERFORMANCE

REVOLUTION

A technical collaboration to provide a complete and ready-to-use solution for motion control

Similar orientations
- MODULAR SOLUTION
- STANDARDIZATION OF HARDWARE
- NO OR MINIMAL IN-HOUSE DEVELOPMENT

Current results

Founding event: Workshop

Discussions about motion control in radiation facilities - May 2011
20 people from 7 synchrotrons
- A written summary
- A mailing list: mocro@synchrotron-soleil.fr
- A motion workshop every second year (next in Diamond facility)

Main steps defined

- Selection of industrial motion control
- Design of a crate for integration
- Call for tenders
- Software development (embedded and Tango devices)
- Training sessions and documentation

In progress

- Market analysis of controllers
- Technical evaluation of some controllers

* dominique.corubre@synchrotron-soleil.fr