



Control Session Summary

(Or what I understood from it)

Clara Gaspar, May 2000

■ Systems to be controlled

- Motors, Vacuum, Cooling

■ Main Issues

- Safety of the Detector

- PLC's for "process control"

- Interface with LHC machine

- Close contact with the LHC vacuum people

- HW signals not well defined yet

- Interface to LHCb ECS

- The PLC's will be controlled by the SCADA FW

Requirements from Sub-detectors

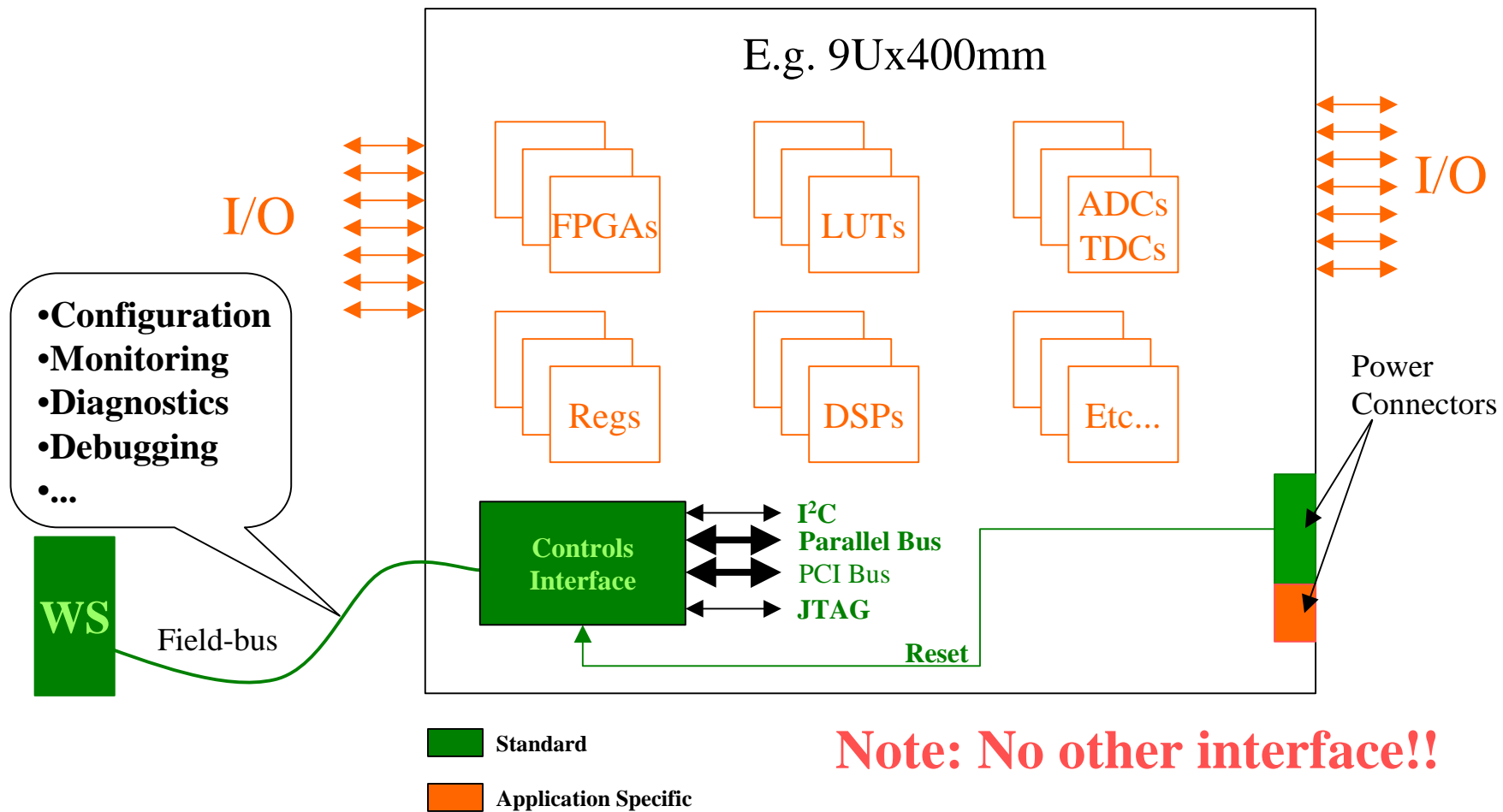
- Nr. Of Boards
 - | ~8000 (many of each are quite small)
 - Mostly Outer tracker and Muons
- Nr of Crates (no need for VME)
 - | 150 - 200
- Needed Interfaces:
 - | I2C, JTAG and some form of a parallel Bus
 - | Serial, I O lines also used
- Data Volume (mainly for configuration)
 - | from a few bytes to a few MegaBytes
- We would like more information
 - | Radiation doses and what boards sit where



Chip-level (or small boards) Interface

- CCU Rings (S. Marchioro for CMS tracker)
 - | I²C, JTAG, 8 bit parallel bus (plus timing signals)
 - | Radiation hard
- Long Distance I²C/JTAG
 - | both are feasible and very simple
 - | No problem with radiation damage
 - | Potential grounding problem
 - | Daisy chain ? (bus Problem)

Board-level Interface



Board-level Interface

■ Possible **green box** Implementations:

■ Credit-Card PCs

- | Provides all required on board interfaces
- | Provides enough bandwidth
- | Not Radiation-Hard (should be tested)
- | Good for boards in the barracks

■ Fire wire

- | Enough bandwidth
- | Don't know if it's feasible yet
- | Not Radiation-Hard (but maybe simpler?)

Board-level Interface

I Other Possibilities:

I CCU Rings

- Not enough bandwidth
 - Save Look Up tables and FPGA code on EEPROM ?
- Not enough address space (on the board)
 - Very slow and cumbersome software on “Supervisor” ?
- More design effort on each board

I Fieldbuses (CAN or Profibus)

- Same as for CCU rings
- Not Radiation-Hard controllers

I Just I2C/JTAG ?

Dominique Breton will make a proposal for Milano

General Control Infrastructure

- **The Generic Architecture was presented**
 - Hierarchical, homogeneous (still Preliminary)
- **A framework will be available**
 - Based on a SCADA system (JCOP)
 - It will provide:
 - Tools to interface to HW Devices
 - Pre-implemented Components for “Standard” solutions
 - Tools to implement the Hierarchical Entities
 - Partitioning, alarm handling, User Interfacing