

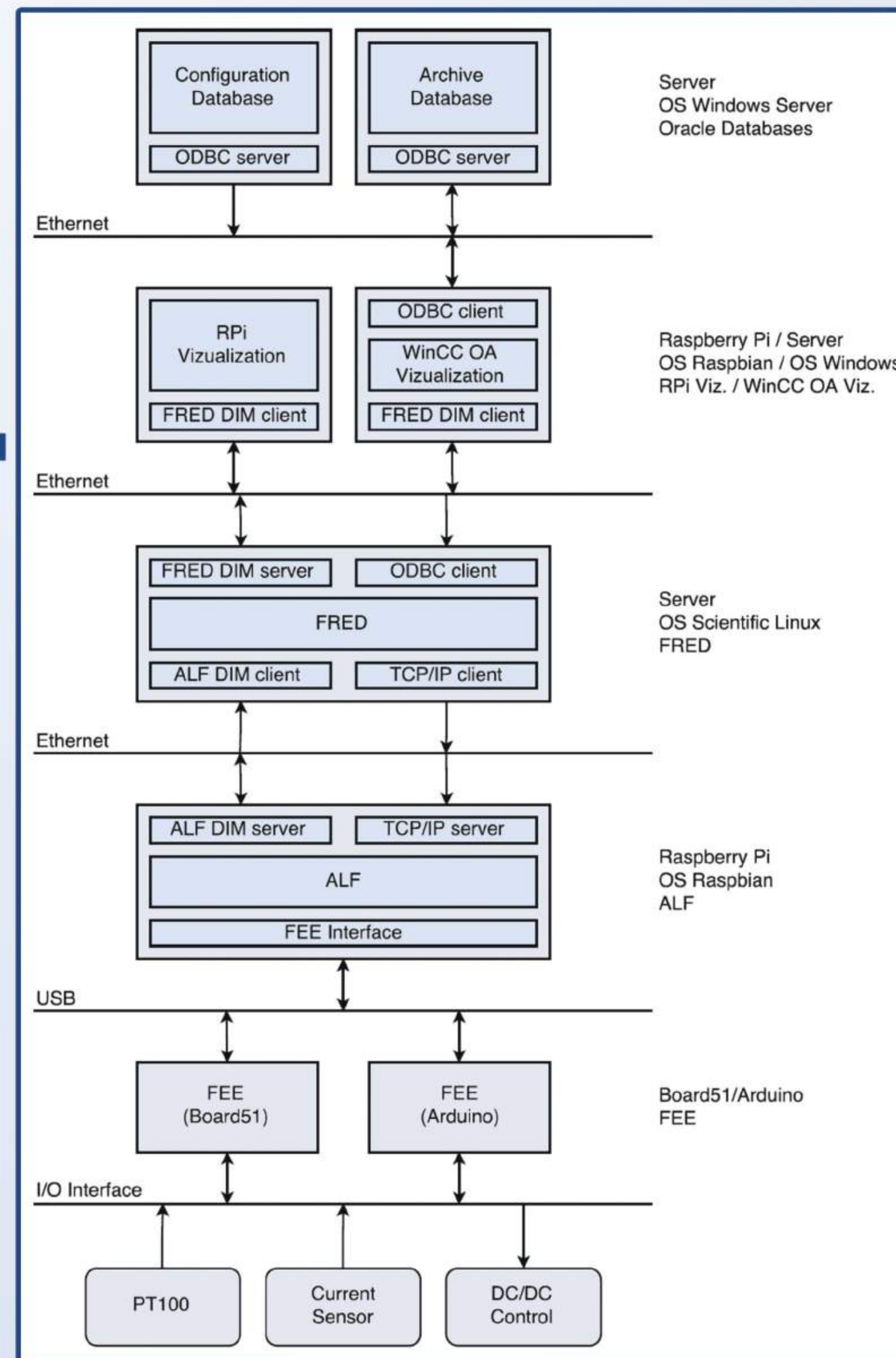
# A NOVEL GENERAL PURPOSE DATA ACQUISITION BOARD WITH A DIM INTERFACE

J. Jadlovský, A. Jadlovská, S. Jadlovská, M. Oravec, D. Vošček, M. Kopčík, J. Čabala, M. Tkáčik, Technical University of Košice, Košice, Slovakia

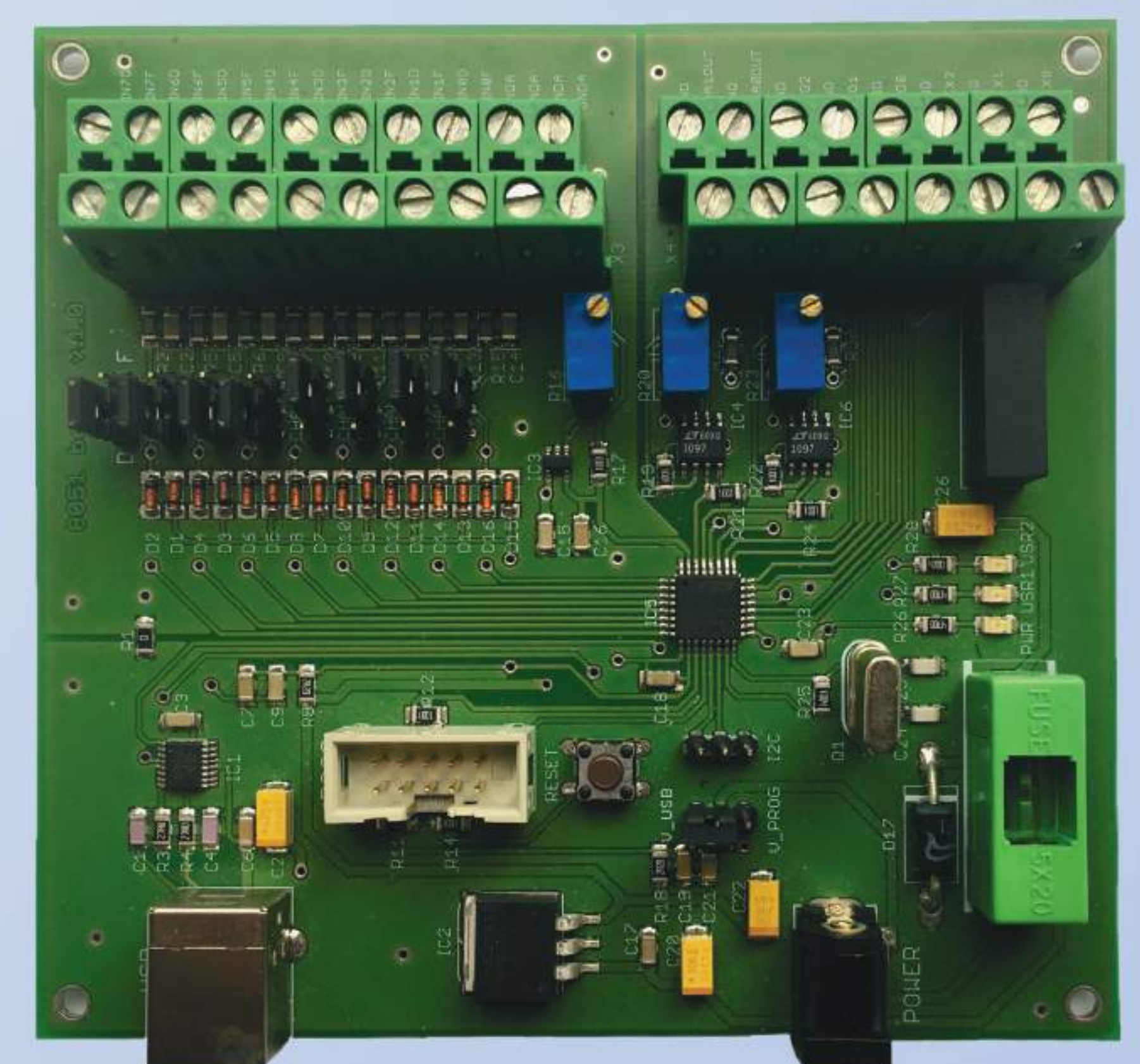
P. Chochula, O. Pinazza, CERN, Geneva, Switzerland

**Abstract** - A new general purpose data acquisition and control board (Board51) is presented in this paper. It provides analog I/O functionalities and is equipped with software bundle, allowing for easy integration into the SCADA systems used at CERN. Based on the Silicon Labs C8051F350 MCU, the board features a fully-differential 24-bit Sigma-Delta ADC that provides an ability to perform very precise DAQ at sampling rate up to 1kHz. For analog outputs two 8-bit current-mode DACs can be used. The Board51 is equipped with serial UART to USB interface that allows communication with any computer platform running Linux or Windows OS. To ensure compatibility with CERN communication architecture the board can be controlled through the DIM system. This is provided by the program running on host computer that publishes services that include measured analog values of each ADC channel and accepts commands for setting ADC readout rate and DACs voltage. Digital inputs and outputs are also accessible using the DIM communication system. Considering these services, any computer on a common network can read measured values and control the board.

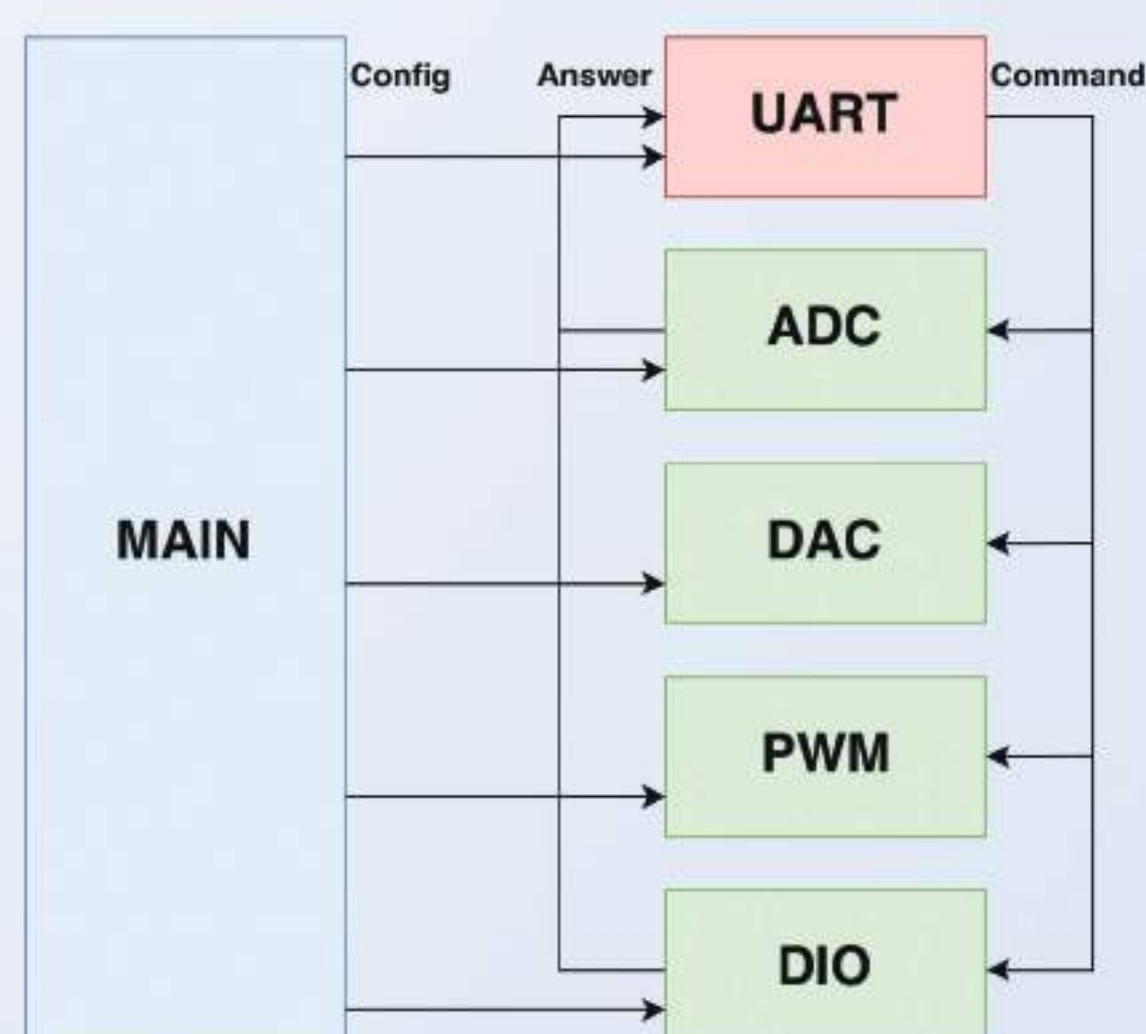
## ALFRED communication architecture at Košice and at CERN using Board51 for data acquisition and control



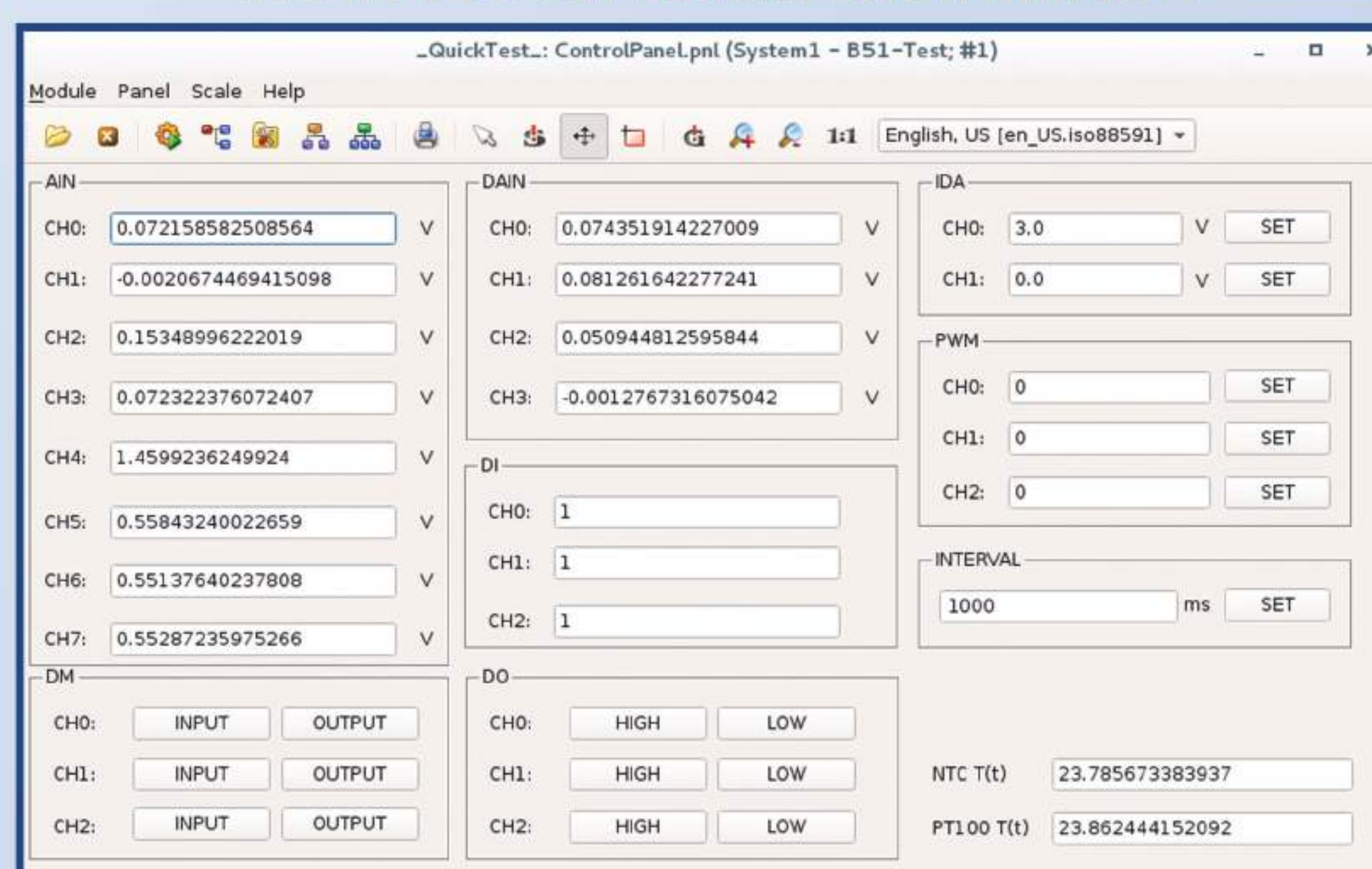
Board51



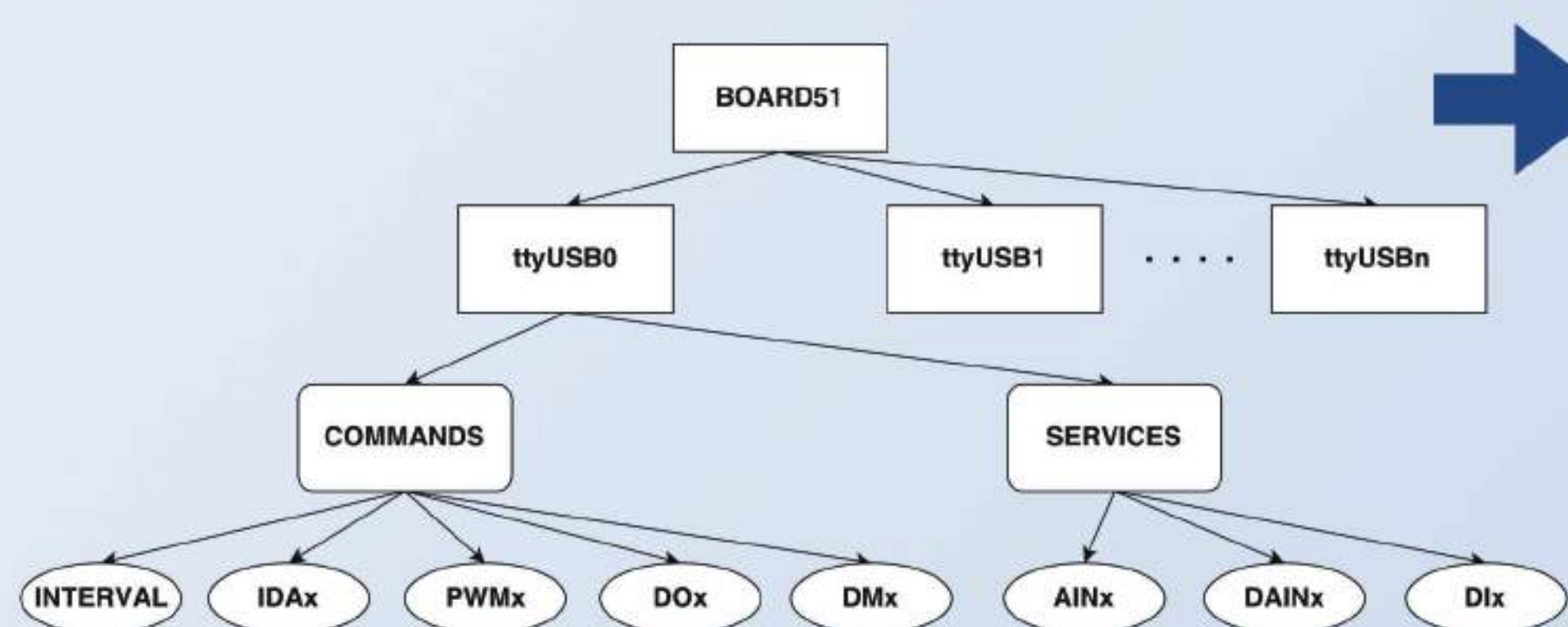
### Logical deployment of MCU program's modules



### The WinCC OA visualization window



### Hierarchy of DIM services and commands created by the program



**Conclusion** - The purpose of this paper is to present a new general purpose data acquisition and control board named Board51, together with the software for connecting the board to the MATLAB simulation environment as well as the application for data distribution and control of the board through the DIM system. This application makes it possible to connect the board with an existing communication architecture used in the detector control system of the ALICE experiment including the direct connection to the WinCC OA SCADA/HMI system.

