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Industrial Controls at CERN

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Abstract:
The industrial control systems at CERN are mainly based on off-the-shelf components present in many industries like oil and gas, electrical power, water treatment, pharmaceutical or food with fundamental constraints mainly due to the size, criticality and accessibility of the CERN installations. These components are deployed in all the layers of the classical automation pyramid and involve SCADAs (Supervisory Control and Data Acquisition) systems, industrial controllers as PLCs (Programming Logic Controllers) or IPC (Industrial PCs) and intelligent instruments. Their interface is ensured by standardised communication fieldbuses and protocols (i.e. Profinet, Ethernet/IP, OPC-UA$\cdots$). The openness of those components allowed a customisation in form of standard frameworks which allows a more efficient development, deployment and operation of the control systems.

The talk will introduce the architecture, components and frameworks used at CERN within the context of the industrial controls, the organisation of the Industrial Control group to achieve the CERN challenges as well as introducing innovative concepts matching the Industry 4.0 initiative.

About the speaker:
Dr. Enrique Blanco is a MSc in automation engineering and he received his PhD in systems and process engineering, from the University of Valladolid, Spain. He joined the European Center for Nuclear Research (CERN), Switzerland, in 1995. He is currently the head of the Control Systems Engineering section in the Industrial Controls and Safety Systems group at CERN, Switzerland and co-chairs the Controls Committee, a board to ensure common controls-wide strategy within the accelerator sector at CERN.
He has been the project leader of the UNICOS framework as well as of a number of control systems as the LHC Cryogenics or the Quench protection system among others. He provides technical expertise in several fields as process control, advanced control, optimisation, safety instrumented systems, industrial communications and formal methods applied to control systems.

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