

FTEC Project: Design, development and testing of PLC based industrial control systems for high power converters and static var compensators

Department:

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Description:

You will join the Converters Controls Software section of the Electrical Power Converters group at CERN, and more specifically the team in charge of the PLC based industrial applications for controlling and interlocking some of the most powerful systems at CERN. You will have the opportunity to participate in all the phases of important projects such as the new main power converters for the PS and PSB accelerators, the Static Var Compensators of the LHC, or the circuit disconnectors of the HL-LHC inner triplet power converters.

You will use the most modern industrial automation technologies (Siemens S7-1500 PLCs, TIA Portal, Profinet, Modbus, WinCC-OA), participating in the design of the hardware control architecture and the development of PLC software based on UNICOS-CPC (the framework developed at CERN for PLC based control applications) using Continuous Integration techniques.

Functions and training value:

You will implement PLC based industrial controls systems for controlling and interlocking main power converters and static var compensators. The work will consist of:

- Gathering requirements from power engineers and writing specifications
- Designing controls architecture and choosing hardware components
- Configuring industrial network communications and fieldbuses
- Learning the UNICOS-CPC framework and using it to develop standard PLC software for Siemens S7-1500 PLCs on TIA Portal (training on UNICOS-CPC and TIA Portal could be provided)
- Using Continuous Integration techniques for software development: Git, Gitlab CI, Python scripts for automatic testing
- Participating on the testing and commissioning of the implemented systems
- Collaborating with engineers and technicians of the Electrical Power Converters group and other departments

Qualification / skills required:

- MSc. in Industrial Automation and Electronics, or similar
- Good knowledge and some working experience with PLCs both hardware and software (ideally with Siemens PLCs on TIA Portal)
- Programming in Python

- Experience with Git (or other versioning tool) and/or Continuous Integration and/or automatic testing
- Knowledge of Linux OS and command line
- Some knowledge of power converters and high voltage electrical installations would be a plus