Digital Electronics and Firmware Engineer

Digital Electronics and Firmware Engineer in the Beams Department (BE), Radio Frequency Group (RF), Servos & Controls Interface Section (CS), BE-RF-CS.

Associated Benchmark Job

Electronics Engineer (tbc)

Grade
6 or 7

Job description

Introduction

You will join:

The Beams (BE) Department, which is responsible not only for the operation of all of CERN's accelerators, but also for a number of the specialised technologies and disciplines required for the design, construction and operation of particle accelerators.

The Radio Frequency (RF) Group, in the BE Department, which is responsible for RF technology and the operation of the RF acceleration and transverse damping systems in all the CERN accelerators. A significant part of the RF group's activity is dedicated to accelerator upgrades and new projects.

The Servos & Controls Interface Section, in the RF Group, which is a cross-disciplinary team that provides expertise in all aspects of digital control of the RF systems, including hardware design with programmable logic, digital signal processing, process control with Programmable Logic Controllers (PLCs), real-time control using VMEbus, MicroTCA and Industrial PC front-end computers, and application software running on operator consoles.

Functions

As a Digital Electronics and Firmware Engineer in the Servos & Controls Interface Section, you will be working on RF signal processing and feedback applications as well as the interface between accelerator hardware and the control system. You will:
•   Undertake the theoretical preparation, FPGA firmware development, deployment and beam commissioning of Low Level RF (LLRF) systems throughout the CERN accelerator complex. Take responsibility for the exploitation and future evolution of these systems.
•   Participate in the development of future hardware platforms for digital LLRF. Define and coordinate the integration of these systems into the accelerator control system.
•   Develop and maintain tools for development of FPGA firmware and management of design flow. Coordinate and support the use and evolution of these tools, according to best practices, in the various development projects in the RF group and in collaboration with other equipment groups.
•   Participate in the operation and exploitation of RF equipment throughout the CERN accelerator complex, including as a member of the LLRF stand-by service.

Competencies and experience

Technical:
Essential:
- Proven experience in the development of FPGA firmware and VHDL
- Software development: Scripting languages such as Python
- Experience of Electronic Design Automation tools
- Experience in the application of control theory

Would be an advantage:
- Experience with high speed digital electronics and data links
- Design of RF electronics

Behavioural:
- Working in teams: building and maintaining constructive and effective work relationships
- Learning and sharing knowledge: thinking "out of the box" and proposing fresh ideas, insights and methodologies
- Achieving results: driving work/projects along and seeing them through to their conclusion
- Communicating effectively: ensuring that information, procedures and decisions are appropriately documented

Note on Employment Conditions:

- Work during nights, Sundays and official holidays, when required by the needs of the Organization.
- Stand-by duty, including nights, Sundays and public holidays, when required by the needs of the Organization.
- Work in radiation controlled areas.
- Interventions in underground installations.
- A valid driving licence.