Call for contribution of expertise

CERN invites collaborating institutes and universities to contribute the expertise of their qualified employees to the activity described below.

Start date: Asap	*Duration:* One year, possible extension to a maximum of up to two years.

Project/Activity: FGC Ether Library Engineer

The Electrical Power Converter group is responsible for the development and operation of the software used to control the power converters that drive current in the magnets. The group uses a variety of hardware platforms, including the third generation of embedded controller called a Function Generator/Controller (FGC3). Operators in the CERN Control Center (CCC) use a set of software applications to control and monitor the power converters. These applications communicate with the software running in the FGC3s using an infrastructure composed of different elements, including middleware, databases, timing systems and fieldbuses. Since this infrastructure has been tailored to CERN's requirements, it is not possible at the moment to integrate CERN power converters with FGC3 controllers into other accelerator facilities around the world. In order to overcome this limitation, a project was launched at the beginning of 2017. This will develop an open source C library to communicate with FGC3s from any Linux PC with two Ethernet interfaces, via a dedicated Ethernet network. A specification for the library has been written, and the first version is being developed. The first use of the library will be at the ESRF synchrotron light source in Grenoble in 2017, followed by the TRIUMF cyclotron in Vancouver in 2018.

Detailed description of Activity:

- Become familiar with the current library specification and code.
- Continue the development of new features for the library.
- Support developers from other accelerator facilities on the use of the library.
- In addition, she/he may also participate in other development activities in the section.

Profile: Computer or Electronics engineer. Good theoretical and practical experience with programming multi-threaded applications in C. Good theoretical and practical understanding of distributed systems. Good knowledge of modern collaborative software development techniques using a version control tool.

Specific details: The expert shall bring new best-practice methods for software development to improve the effectiveness of the development team. A positive attitude and good communication and team-working skills are also essential.

The team uses Git for version control and Atlassian collaboration and continuous integration tools (JIRA, Confluence, Bamboo). Development of the libraries is done under Linux.

During the two years, the expert will have the opportunity to improve their programming skills using C, as well as learning about the control of power converters within the context of particle accelerators.

She/he will interact with developers in other institutions, offering assistance and support when

necessary. The expert will write well-structured and maintainable code for the FGC_Ether library project and in that way, contribute to the sharing of CERN's power converter designs with other labs. Good working knowledge of either English or French.

Status at CERN: Associated Member of the Personnel (Project Associate).

Conditions in accordance with CERN's Staff Rules and Regulations and Administrative Circular No. 11. Subsistence allowance is payable by CERN to cover the additional cost arising from the individual's (and, as applicable, their family's) stay in the local area while performing activities at CERN.

Option: Collaborating institutes and universities can propose to support the activity of the qualified employees participating in this "Call for contribution of expertise" with students or other employees. Their status and Subsistence allowance when applicable will be adapted to their relation with their institutions

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