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Architecture overview of the FGCDv2, CERN's brand-new power converters control framework

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The CERN's Electrical Power Converters group is responsible for around 4000 power converters controlled, monitored, and diagnosed using Function Generator/Controller (FGC) devices. These devices run either on in-house designed embedded hardware (FGC2, FGC3) or in Front-End Computers. The latter flavour of devices is encoded in the FGCDv1 framework, which also implements the logic interfacing CERN's control system to communicate with operational tools, applications, and services.

This paper presents the new version of the FGCD framework, the FGCDv2, developed from the ground up using the modern C++20 language and designed with modularity in mind, allowing for multi-platform compilation (x86, AArch64), easy extensibility and maintenance. The pool of modules available in the FGCDv2 framework will be the basis for the process running in the Front-End Computers and the process running in the new embedded hardware platform, FGC4, promoting code reusability. Finally, to export the FGCDv2 framework to external laboratories through the CERN Knowledge Transfer program, the interface to the industrial control standards TANGO and EPICS will be integrated in the design from the very beginning.

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Footnotes

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