

JAVA BASED SUPERVISION OF DIGITAL FEEDBACK SYSTEMS IN THE RFX NUCLEAR FUSION EXPERIMENT

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RFX is a large toroidal machine in the European Programme for nuclear fusion. Digital active feedback systems are used in RFX for both the control of the global magnetic configuration and for the correction of local magnetic field errors. A general scalable distributed architecture has been realized for the RFX feedback systems. It is based on processor networks using Digital Signal Processors (Texas Instruments TMS320C40) mounted on VME racks and connected to each other directly or via dedicated fiber optic links. The software architecture defines a general framework in which software components can be defined and configured. Each component is associated with a processor and is responsible for the overall data flow management. A transfer function is then associated with each component in order to define the algorithms performed by the associated processor. A graphical tool written in Java provides the overall handling of the control systems. For each system component it allows the data flow configuration and the retrieval of both status and setup information. Communication is achieved via Remote Procedure Calls and is handled by processes running on the VME controller CPUs, acting as bridges between the local DSP memory and the RFX Local Area Network.