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Software Design and Implementation of the SHINE LLRF System

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This report presents the design and implementation of the SHINE LLRF system software. The software architecture is designed in a layered approach, consisting of two layers. The lower layer is responsible for low-level control of individual sites, specifically for each cavity. It implements EPICS IOC (Input/Output Controller) on the Zynq platform to handle various operating scenarios including normal operation, equipment maintenance, and fault handling. The software offers system status monitoring, parameter measurement and calibration, parameter optimization, cavity conditioning, and fault handling.The upper layer is the management software that oversees all the sites and implements collaborative logic between them. It monitors the status of all the sites and handles any faults that may occur. It also includes fault analysis capabilities for troubleshooting purposes.With this software architecture, the system can effectively manage and monitor multiple sites, allowing for coordinated operation and efficient fault handling.

Keyword

LLRF,Zynq,EPICS

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