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EPICS 7 upgrade for LCLS-II undulator motion control system

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Undulators are essential components of the new LCLS-II X-ray Free-Electron Laser (XFEL) facility, providing highly bright and coherent X-ray light for researchers. The LCLS-II includes two undulator lines: the hard X-ray (HXR) line and the soft X-ray (SXR) line, each with distinct architectures. The HXR undulator motion control system, based on RTEMS running on VME and Animatics SmartMotors, leverages existing LCLS hardware for maximum efficiency. In contrast, the SXR undulator system is newly designed with an Aerotech motion controller, both systems are built on EPICS v3 Input Output Controllers (IOCs). To meet the requirements of a significant cyber security upgrade of the EPICS controls framework at SLAC, we have upgraded all EPICS IOCs from EPICS v3 to EPICS 7. This article details the software architecture and upgrade process for the motion control systems of both the HXR and SXR undulators.

Footnotes

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