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Beam position monitor control system at the European Spallation Source

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The European Spallation Source facility is divided in three main parts: linear accelerator (LINAC), target and neutron instruments. The Beam Position Monitor (BPM) system is installed along the LINAC and enables accelerator teams to characterize the proton beam properties and optimize the phase tuning of the RF cavities, among other diagnostics. A total of 98 BPM sensors are distributed along the machine, with data acquisition and processing handled by 49 AMC digitizer cards housed in 18 MicroTCA crates. This paper describes the control system architecture surrounding the BPM system, including the EPICS integration alongside the graphical user interface developed in Control System Studio. Additionally, it presents the high-level applications built on top of this framework, such as the BPM Manager, Gain Controls, Archiver, and Synchronous Data Service. The paper also outlines the software strategy adopted for system deployment, maintenance, and updates. Auxiliary systems supporting the BPM infrastructure are briefly discussed, including the BPM components controls, MicroTCA IPMI management and the MRF Timing System integration.

Footnotes

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