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Update of CERN Proton Synchroton (CPS) Beam Controller based on MicroTCA architecture

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The CERN Proton Synchrotron (CPS) Low Level RF (LLRF) is one of the oldest still operating systems at CERN. Due to new needs in beam manipulation, inter-machine synchronization, diagnostics, maintenance and remote machine configuration, the old NIM and VME based, mainly analog, system is set to be replaced with modern digital electronics implemented on a MicroTCA platform. This upgrade also includes a redesigned, more centralized beam controller, paired with compact digital modules, resulting in a significant reduction in hardware requirements. Synchronization between RF stations will be upgraded to use the White Rabbit (WR) deterministic link. This presentation provides an overview of the proposed architecture, hardware, firmware, and development plan, focusing on the beam, radial and synchronization loops, as well as the interaction between this module and other components in the system.

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