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Status Update on MicroTCA based Fast Orbit Feedback System for PETRA IV

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PETRA IV is the upcoming fourth generation 6 GeV low-emittance light source at DESY Hamburg. The Fast Orbit Feedback (FOFB) system for PETRA IV will be a large multi-input multi-output (MIMO) control system in an extended star topology. The layout is optimized to reduce the latency between the 790 beam position monitors (BPM) and the 560 fast corrector magnets. The FOFB system is mainly based on MicroTCA technology. The high-speed data transmission and distributed signal processing for the centralized control scheme are implemented on over 500 Advanced Mezzanine Cards (AMC) in about 100 MicroTCA crates. In this contribution, we present the orbit feedback topology, the requirements for the MicroTCA components, the modeling of the individual subsystems and their interaction in the overall feedback scheme.

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