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Precision X-band RF control system

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The new PolariX TDS and its tomographic capabilities will be used in FLASH2, FLASHForward and SINBAD and shall provide a new level of beam diagnostics. It is developed in cooperation between DESY, PSI and CERN and requires X-band RF front-ends for the measurement of the 12 GHz electric fields. The cavity, waveguide and klystron signals will be down-converted from 12 GHz to 3 GHz and further processed in a standard 3 GHz S-band LLRF system based on MicroTCA.4. We will present the methods used to convert the signals as well as providing an overview of the MicroTCA.4 functions used in this setup. Measurements have shown a short-term jitter of less than 1.5 fs rms added by the conversion system.

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