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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 9 GHz LO generation method and measurements of the 12 GHz front-end setup as well as an overview of the 19"packaging. Preliminary measurements of a prototype setup have shown a short-term jitter of about 1 fs rms for the LO generation and 1 fs rms resolution for the X-band down-conversion.

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