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High speed AMC Digitizer and RTM based application modules

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This contribution describes the design of an Advanced Mezzanine Card (AMC) in the MTCA.4 standard suited for direct analog-to-digital conversion of high-frequency signals up to 2.7 GHz with a maximum ADC clock frequency of 800 MHz. Signal conversion is performed using the undersampling technique. This card was designed for the needs of the LLRF and other control and measurement systems of the FLASH and XFEL accelerators. The AMC is compliant with the A1.1 Analog class for MTCA.4 AMCs.

The designed module consists of eight very-high-speed ADC channels, four high-speed and precision DAC channels, a powerful FPGA unit, fast SRAM memory, along with special power supply and diagnostic circuits. The AMC digitizer work in pair with various project-specific Rear Transition Modules (RTMs).

This paper describes details and parameters of the digitizer AMC and the specialized RTMs, as well as performance and usage of direct sampling of high frequency signals.

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