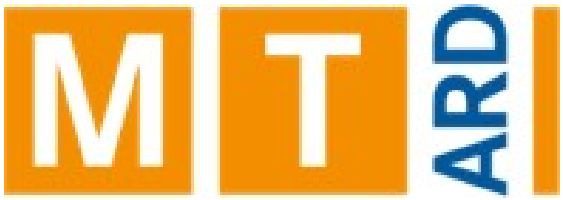

Contribution ID: **13** Type: **Poster (including Speed Talk)**

The DAMC-DS5014DR, a high-speed Digitizer, leveraging the cutting-edge AMD ZYNQ Ultrascale+ RFSoC Technology in a MicroTCA.4 form factor.

Thursday 26 June 2025 15:20 (3 minutes)

This talk reviews the DESY MicroTCA card, DAMC-DS5014DR, designed for high-speed multi-channel data acquisition. Based on AMD Zynq Ultrascale RFSoC ZU47DR, it features eight 14-bit, 5-GSPS ADCs, eight 14-bit, 10-GSPS DACs, extensive programmable logic (PL) resources, and an ARM-processing system (PS). In this card, the AC or DC coupling options ensure that the input signals are pre-conditioned and fed to the ADCs that follow the MicroTCA.4 concept allows users to design a custom RTM specifically designed for signal conditioning. The board offers a QSFP28+ interface that supports 100Gb Ethernet or optical PCIe Gen.4 x4 (16 Gbps/lane) data streaming, while the second set of PCIe Gen.4.0 x8 available on the card provides data transfer to the MicroTCA.4 backplane. Eight independent timing/trigger inputs capture event-coincident data. Three 16-GByte, 64-bit DDR4 memory banks foreseen on this card handle high-throughput data and are especially useful for processing fast data streams. A high-frequency clock synthesizer generates synchronized clocks for ADCs, DACs, and PL, sourced from the backplane, front panel, or a stable local oscillator. The board will follow the CERN white Rabbit, which allows the receipt of white Rabbit Trigger signals via the QSFP Module. Supported by AMD tools (Vivado, HLS, Yocto, Petalinux, SDSoC, SDAccel), the DAMC-DS5014DR combines a large FPGA, fast ADCs/DACs, and a powerful CPU to meet high-speed digitization and processing needs while reducing development time.

Summary

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