

MicroTCA Evaluation and Developments in the CERN PH-ESE Group

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The PH-ESE group at CERN provides support for the electronic systems of the experiments. As part of this mandate a project was launched to evaluate μ TCA infrastructure components, in particular shelves, power supplies and MicroTCA Carrier Hub (MCH) modules. Commercial equipment from different vendors has been acquired, evaluated and interoperability tests have been performed. In addition some custom μ TCA hardware was also developed as part of the project. For instance an Advanced Mezzanine Card (AMC) load board and its associated load rear transition module (RTM) have been developed in order to be able to fully characterize the power supply and cooling performance of μ TCA shelves. The design of a Module Management Controller (MMC) mezzanine card has been finalized in collaboration with an external institute and made available to interested users. A test AMC for the MMC mezzanine has also been developed.

A related development is the Gigabit Link Interface Board (GLIB), which is an FPGA-based double width AMC designed for users of high speed optical links in high energy physics experiments. It is targeted at the evaluation of optical links in the laboratory as well as for small triggering and/or data acquisition system in beam or irradiation tests. The card can be extended through two FPGA Mezzanine Card (FMC) sockets providing application specific connectivity. Some FMC extension modules, for example for interfacing to the LHC Timing, Trigger and Control (TTC) system, have also been developed.

Based on our experience from the μ TCA system evaluation and AMC boards design, we have acquired a good overview of the benefits and challenges associated with the μ TCA platform. In this presentation we will present details about the various in-house developments as well as results from the evaluation project.

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