

Latest Technologies in Beam Diagnostics - HW

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Why New Technologies

- Fully integrated versus modular solutions
- Requirement for high manageability and high availability
- Flexibility issues
- Does users have possibility of in-house development?

Fully Integrated vs. Proprietary Modular vs. Standard Modular 1



Fully Integrated vs. Proprietary Modular vs. Standard Modular 2

Feature	Fully Integrated	Proprietary Modular	Standard Modular
Out of the box functionality	excellent	excellent	moderate
Performance optimized	excellent	excellent	moderate
Configurability (HW)	none	good	excellent
User upgradeable (HW)	poor	moderate	excellent
Open concept	poor	moderate	good

Libera HW Architecture B – Proprietary Modular Solution



- Proven to be very flexible within our range of instruments: **Libera LLRF**, **Libera Brilliance+**, **Libera Hadron**, **Libera Single Pass H**
- Full control of all components as whole instrument was developed in-house.
- Maximum performance is achieved due to complete control over all components.

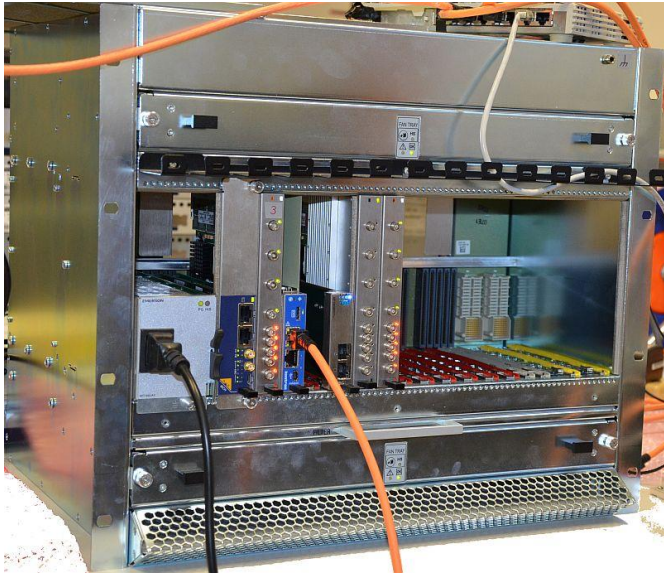
MicroTCA Basic Specification – MTCA.0 Open Standard



Some of the design goals of PICMG MicroTCA specification:

- Complementary to AdvancedTCA
- Favorable cost, size, and modularity
- Target low start-up costs
- Modular and serviceable
- Life span: at least eight years
- Backplane bandwidth: SerDes @ 1–12+ Gb/s
- Scalable system reliability: from .999 to .99999
- Hot Swap/plug-and-play support, in conformance with AMC.0 and consistent with AdvancedTCA

MicroTCA for physics – MTCA.4 open standard



The main reasons of physicists for changing from VMEbus to MicroTCA are that MicroTCA has implemented an extensive remote management that detects all possible faults on plug-in boards, in the power supply systems and in the ventilation system.

- It is a sub specification of MTCA.0 basic specification.
- MicroRTM modules are new in this specification (more space for I/O, enabler to separate analogue from digital)
- Special clock and trigger signals were added to existing MTCA.0 specification
- Offers many features but sometimes interoperability is an issue. Corner cases which are not defined by the standard(interoperability workshop)

Future Outlook



- We gained a lot of experience and good engineering practice in our 13 years of existence.
- Developing our products remains our primary business but we are also prepared to share our knowledge among our customers by working together on various projects.
- Here I would expose collaboration with DESY where one of the projects is already finished and the second one is under development.
- There is also strong Open HW initiative conducted by Mr. Javier Serrano from CERN. The OHW workshop will take place as preconference event of ICALEPS 2011

<http://www.ohwr.org/projects/ohr-meta/wiki/OHWorkshop>

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