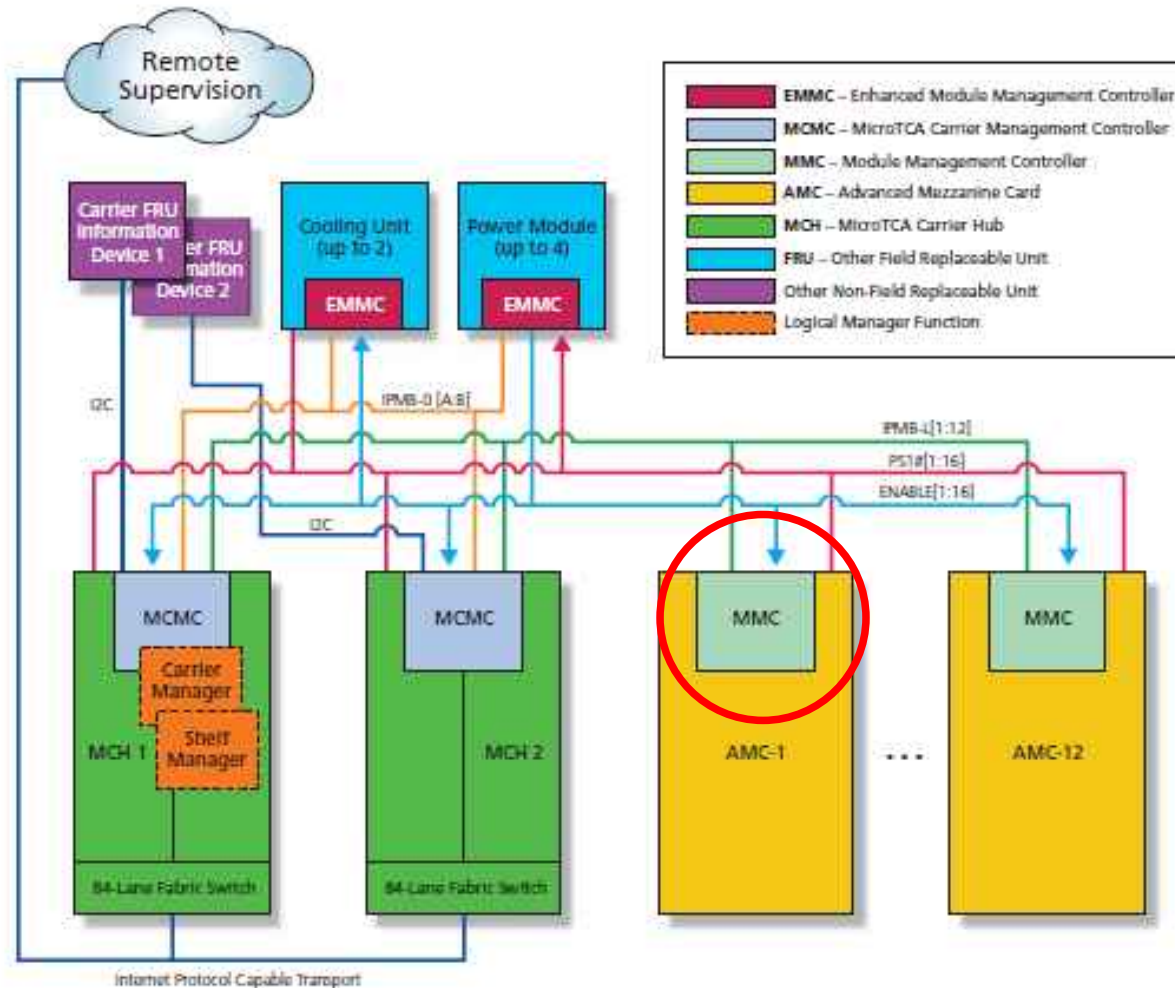# MMC mezzanine implemention

J.-P. Cachemiche, F. Bompard

Outline

- **MMC role**

- **Development motivations**

- **First implementation**

- **Final version**

- **Software**

MMC role

- Manage hot swap sequence

- Board asset information
  - Manufacturer,
  - Product name,
  - Model number,
  - Serial number,
  - Geographical information,
  - Version,
  - Features,
  - ...

- Monitor functions
  - Board and components temperature,
  - Voltage levels,
  - …

- Relies on IPMI (*Intelligent Platform Management Interface*) communication standard

Development motivations

- Developped our own design because
  - Few commercial solutions
  - All proprietary and single source
  - Or expensive IPs

- Use of a mezzanine to:
  - Save room on AMC board
  - Speed-up development

- Received valuable help from Desy who already designed such a functionality
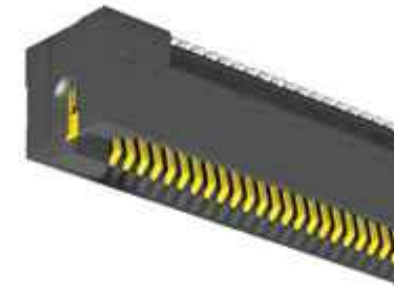 (Thanks to Kay Rehlich and Vahan Petrosyan)
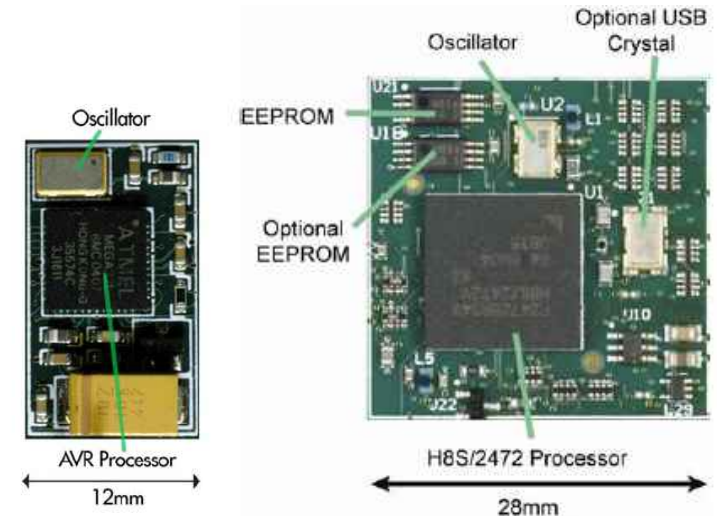
Pigeon Point Reference designs (IPs)
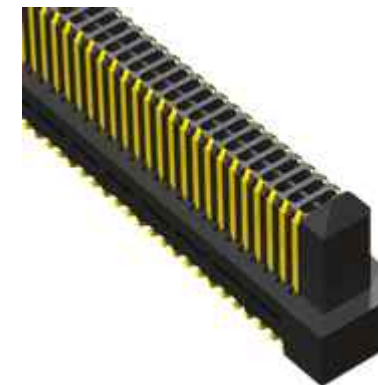
First implementation
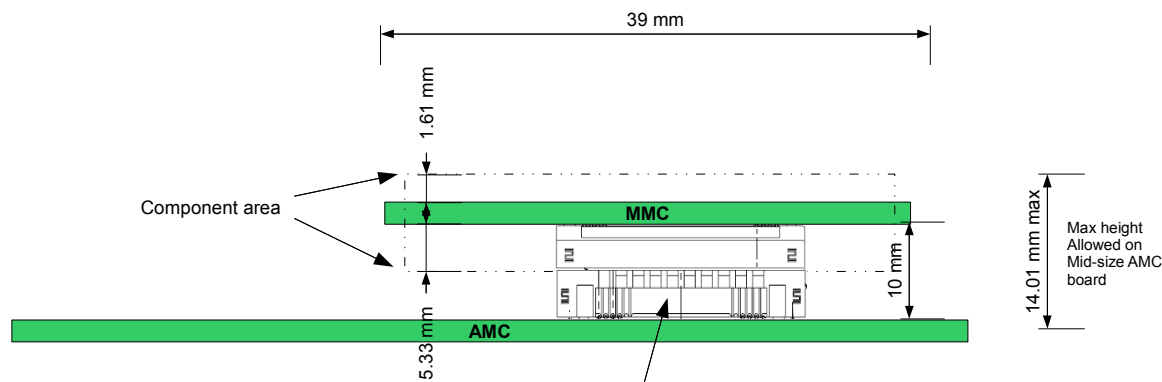
Final implementation

- ◆ Improved connector
  - Number of pins grows from 26 to 40
    - ➔ JTAG management, User-defined pins
  - Mechanical keying and lock

- ◆ Reduced size of mezzanine

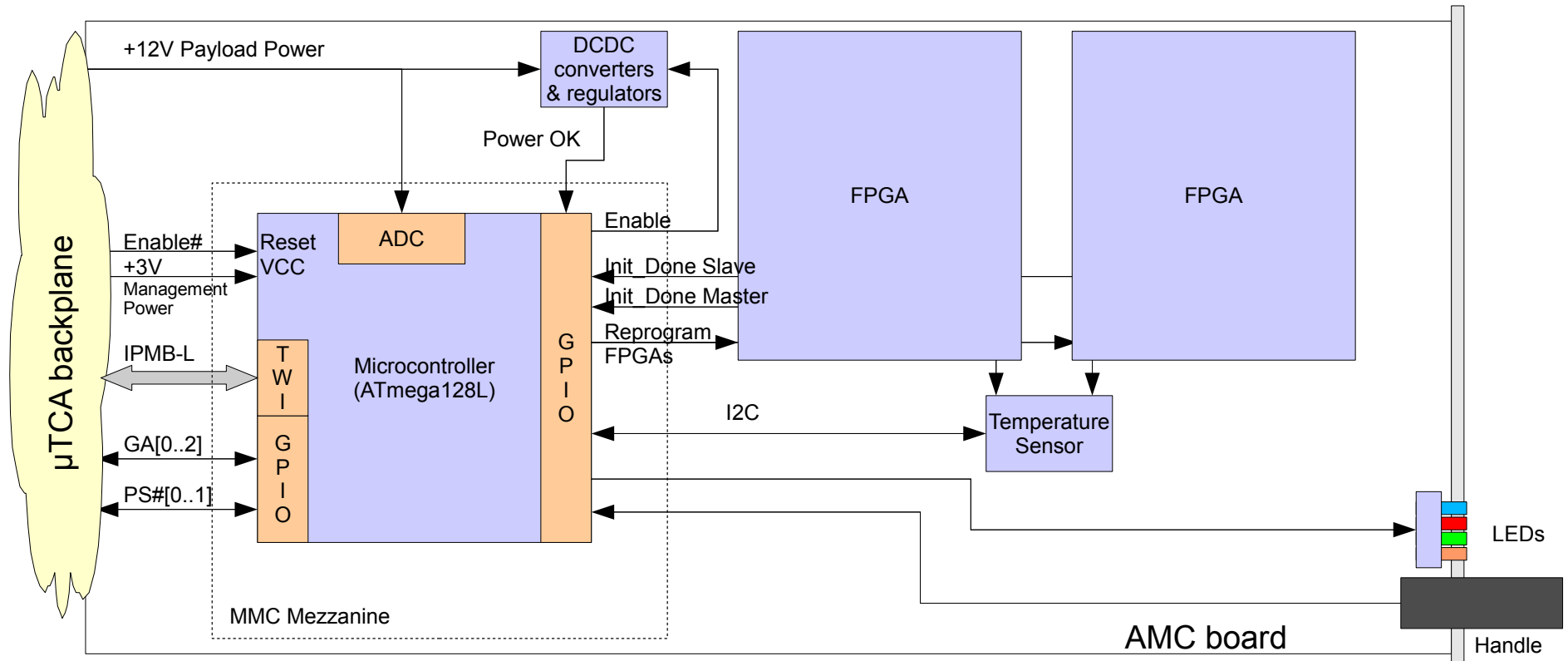- ◆ Dimensions compatible with mid-size AMC

MMC Mezzanine Samtec connector

AMC Samtec connector

39 mm

1.61 mm

Component area

MMC

10 mm

5.33 mm

AMC

14.01 mm max

Max height Allowed on Mid-size AMC board

Samtec ERM8-020-05.0-L-DV-L-TR
See http://www.samtec.com/ProductInformation/TechnicalSpecifications/Overview.aspx?series=ERM8
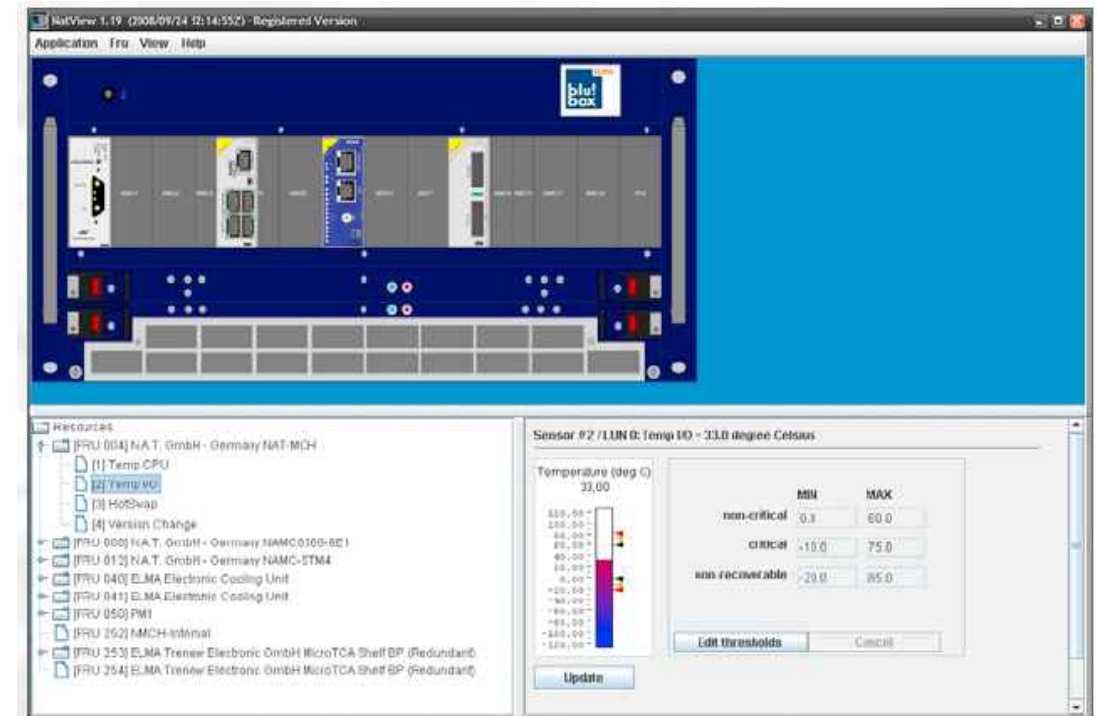
Example of implementation

LHCb Muon trigger system

Software

- ◆ Sources courtesy of DESY

- ◆ Some improvement and tuning made by CPPM
    - Board insertion state machine
    - Temperature reading
    - Write FRU information in EEPROM

- ◆ Tested with MCH commercial board

- ◆ Since then, some improvements made by DESY
    - ➔ Need to merge modifications

Communication with MMC
graphical interface

Conclusion

- Industrial version soon to be released.

- Possibility of shared design/improvements under the agreement from DESY

- CPPM can produce the boards

- User support preferably managed by CERN