

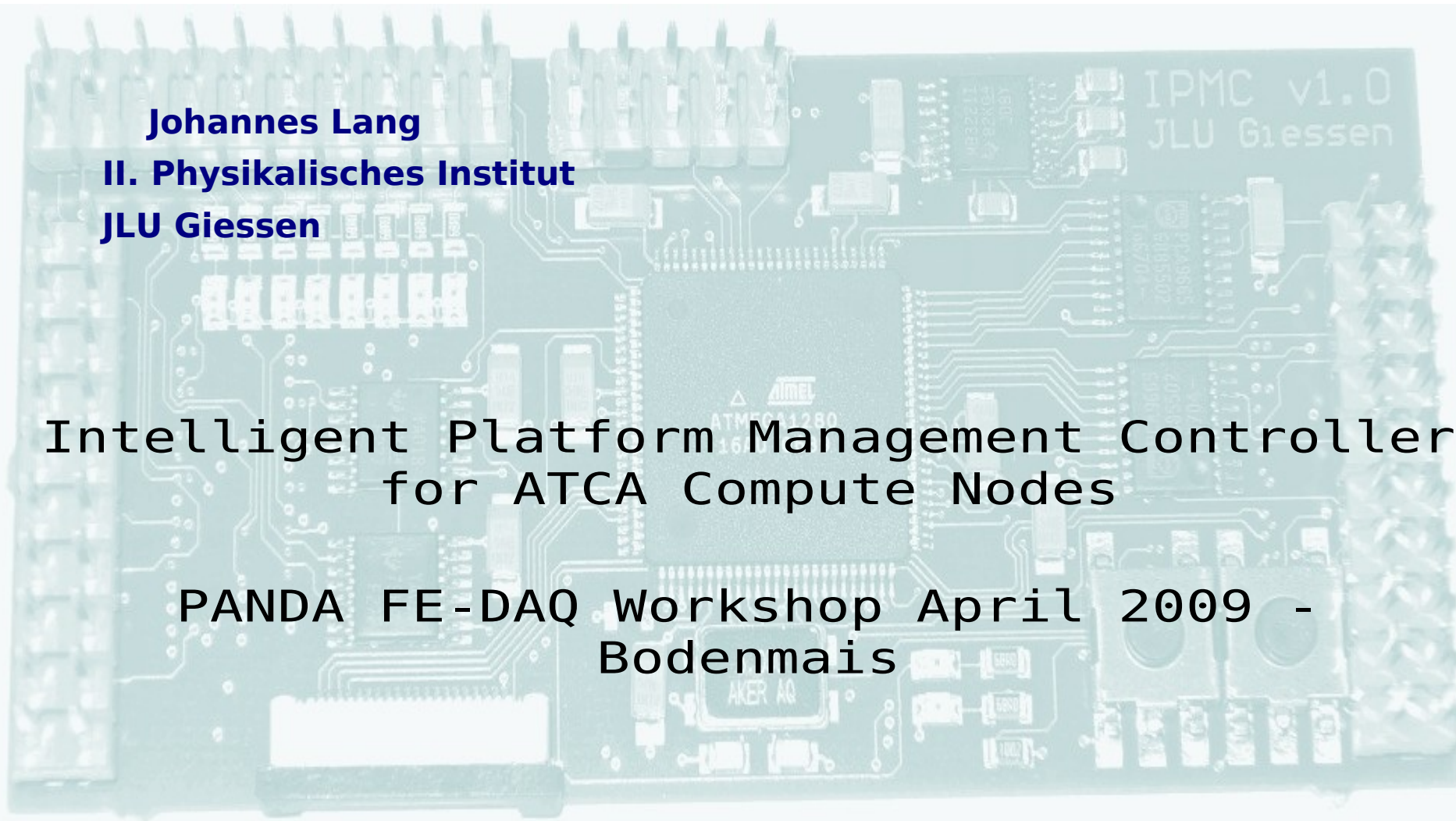
Johannes Lang

II. Physikalisches Institut

JLU Giessen

**Intelligent Platform Management Controller
for ATCA Compute Nodes**

**PANDA FE-DAQ Workshop April 2009 -
Bodenmais**

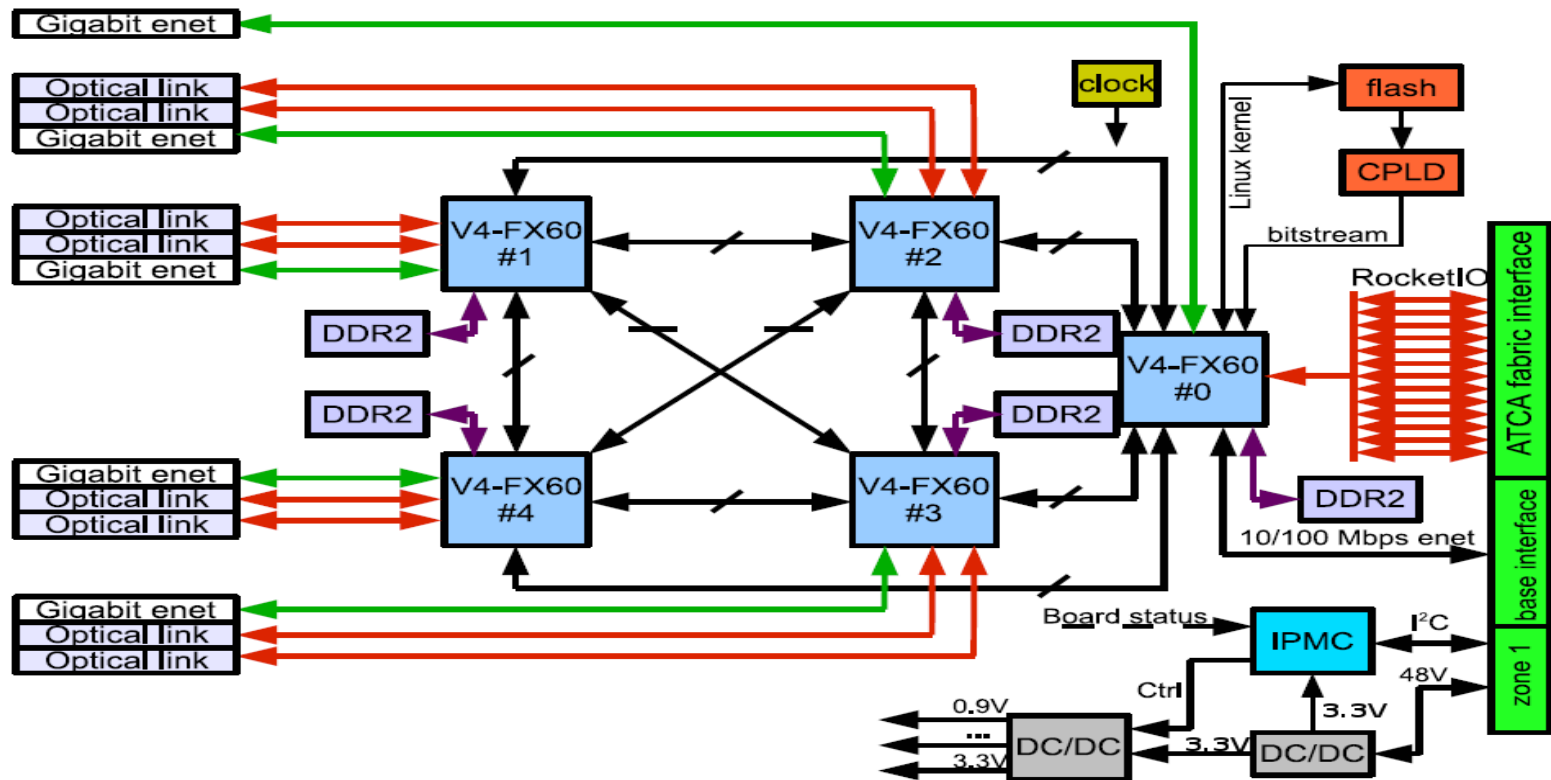


Outline

- × Compute Node for PANDA DAQT
- × Advanced Telecom Computing Architecture (ATCA)
- × Intelligent Platform Management Interface (IPMI)
- × Implementation of an IPMI Controller

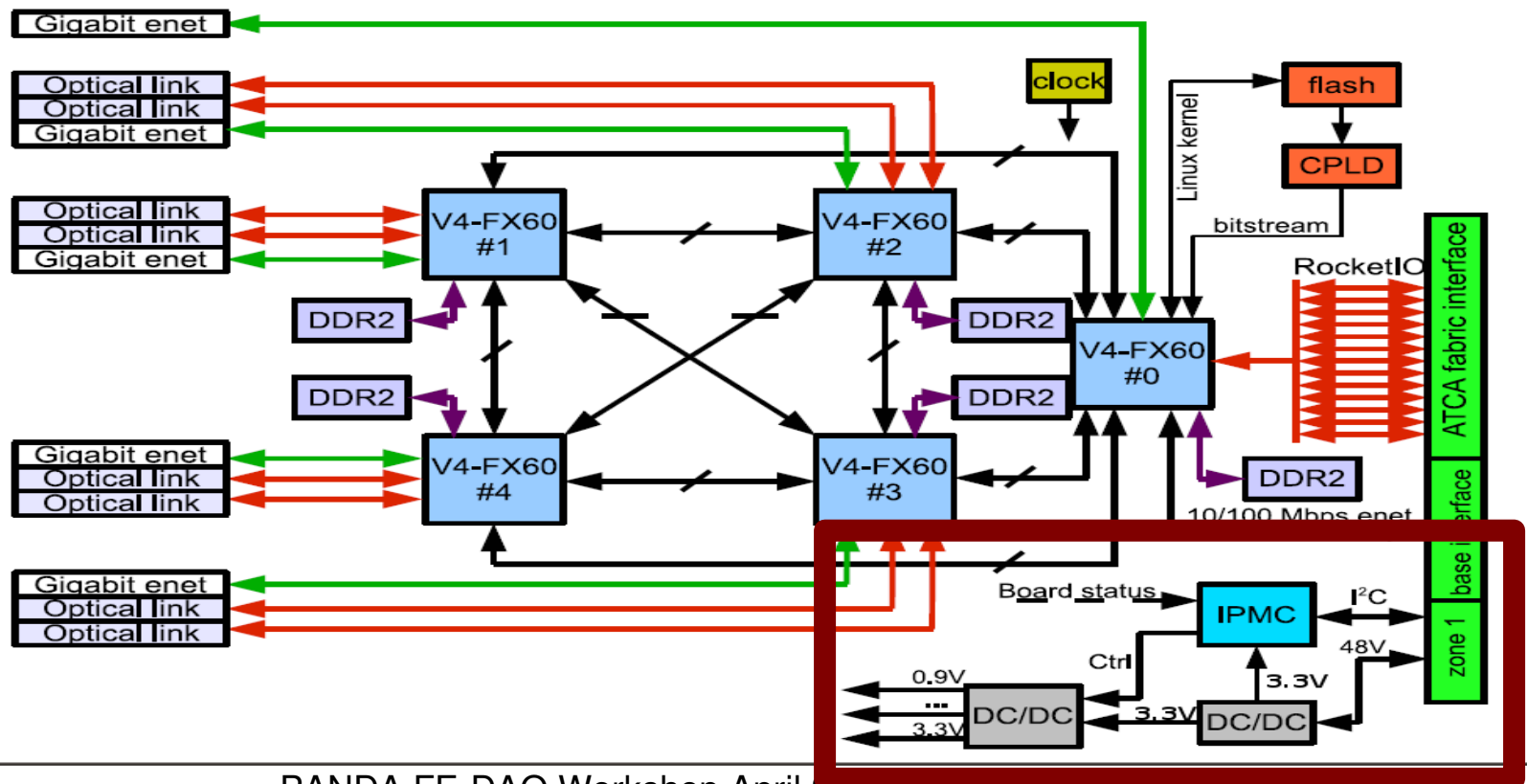
Compute Node for PANDA DAQT

- **FPGA based Compute Node**
- Universal & scalable
- Configurable and flexible
- Takes advantage of **ATCA**



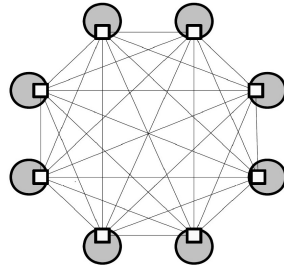
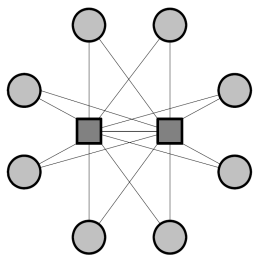
Compute Node for PANDA DAQT

- **FPGA based Compute Node**
- Universal & scalable
- Configurable and flexible
- Takes advantage of **ATCA**

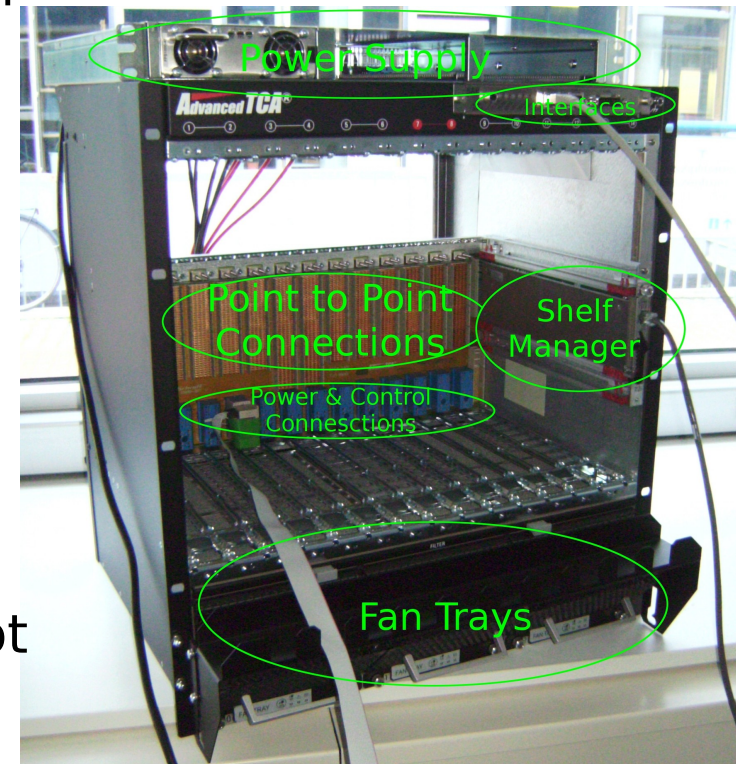


ATCA

- Advanced Telecom Computing Architecture
- Integrated bandwidth of backplane: up to 2.1Tbit/s
- Serial point to point connections
- Dual Star & Full Mesh Fabric topology








- 8U boards (31.1cm x 28cm)
- Cooling capability up to 200W per slot
- 48V power supply
- Redundant & reliable
- Shelf Manager allows **IPMI** management

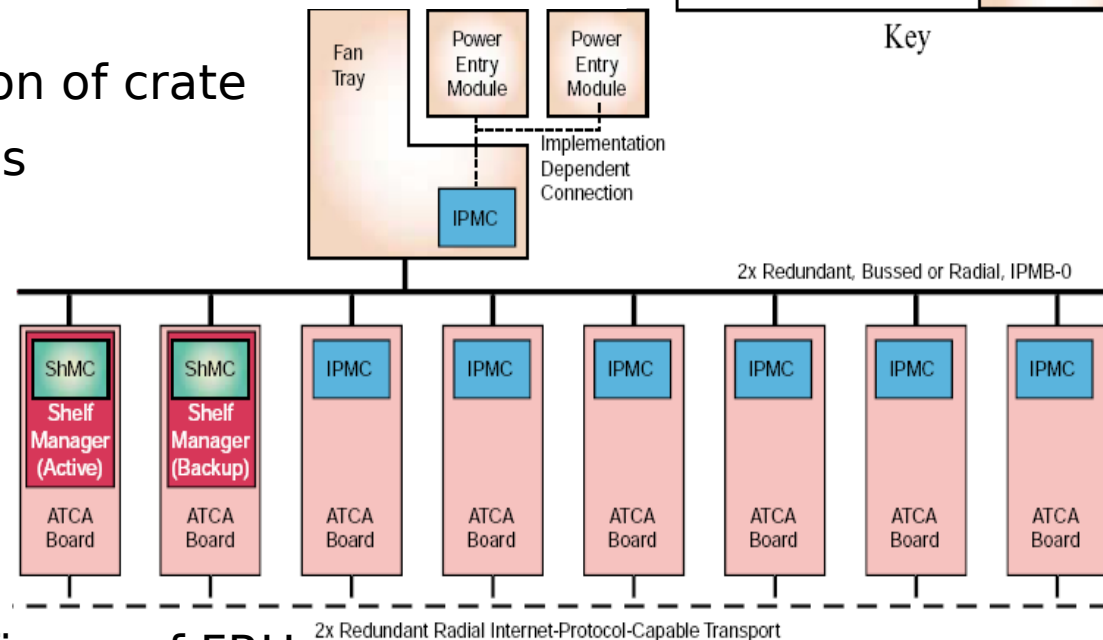


Intelligent Platform Management Interface

- Manage & monitor the operation and health of each Field Replaceable Unit (FRU)
- ATCA specification requires IPMI Controller for every FRU
- Communication via 2 x I²C bus
- Important features:
 - Control power consumption of crate
 - Handle cooling capabilities
 - Hot Swap
 - Electronic keying (backplane assignment)
 - Sensor readings
 - Web Interface (repository)
 - Remote reset/reboot/configure of FRUs

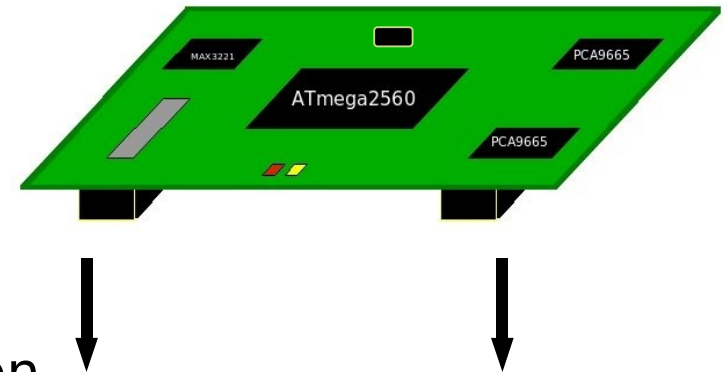
IPM Controller (IPMC)	
Shelf Management Controller (ShMC)	
AdvancedTCA Board	
Shelf Manager	
Other Field Replaceable Unit (FRU)	

Key



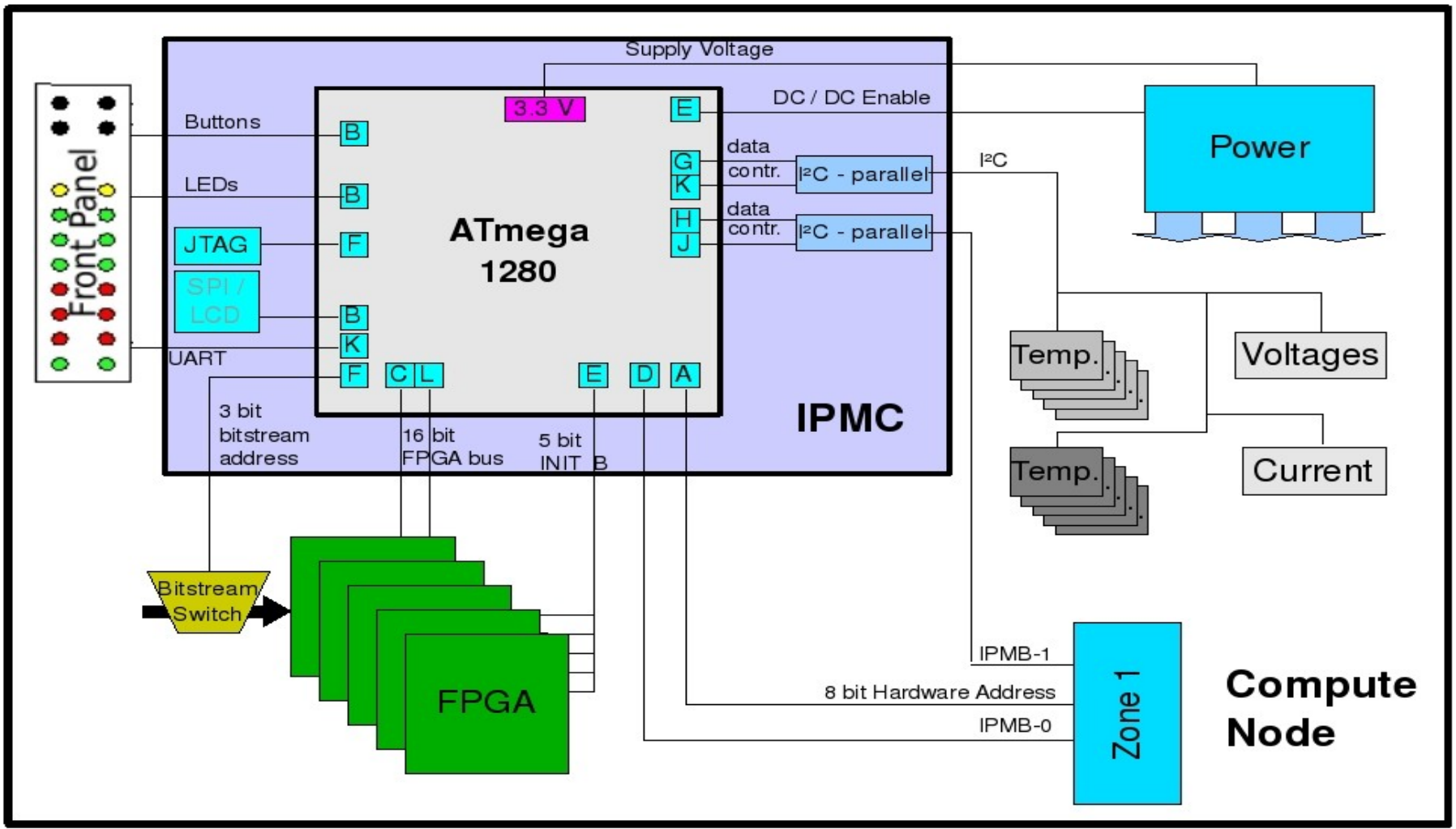
IPMC Add-on Card

- Pluggable & portable Add-on Card
- ATMEL ATmega2560
 - 8 bit AVR microcontroller
 - 256KByte Flash
 - 1 x I²C
 - 86 Programmable I/O Lines
- Small outline & low power consumption
- 2 x I²C to parallel interfaces
- Program & extension connector
- UART driver
- 2 x 60 pin connectors to ATCA board

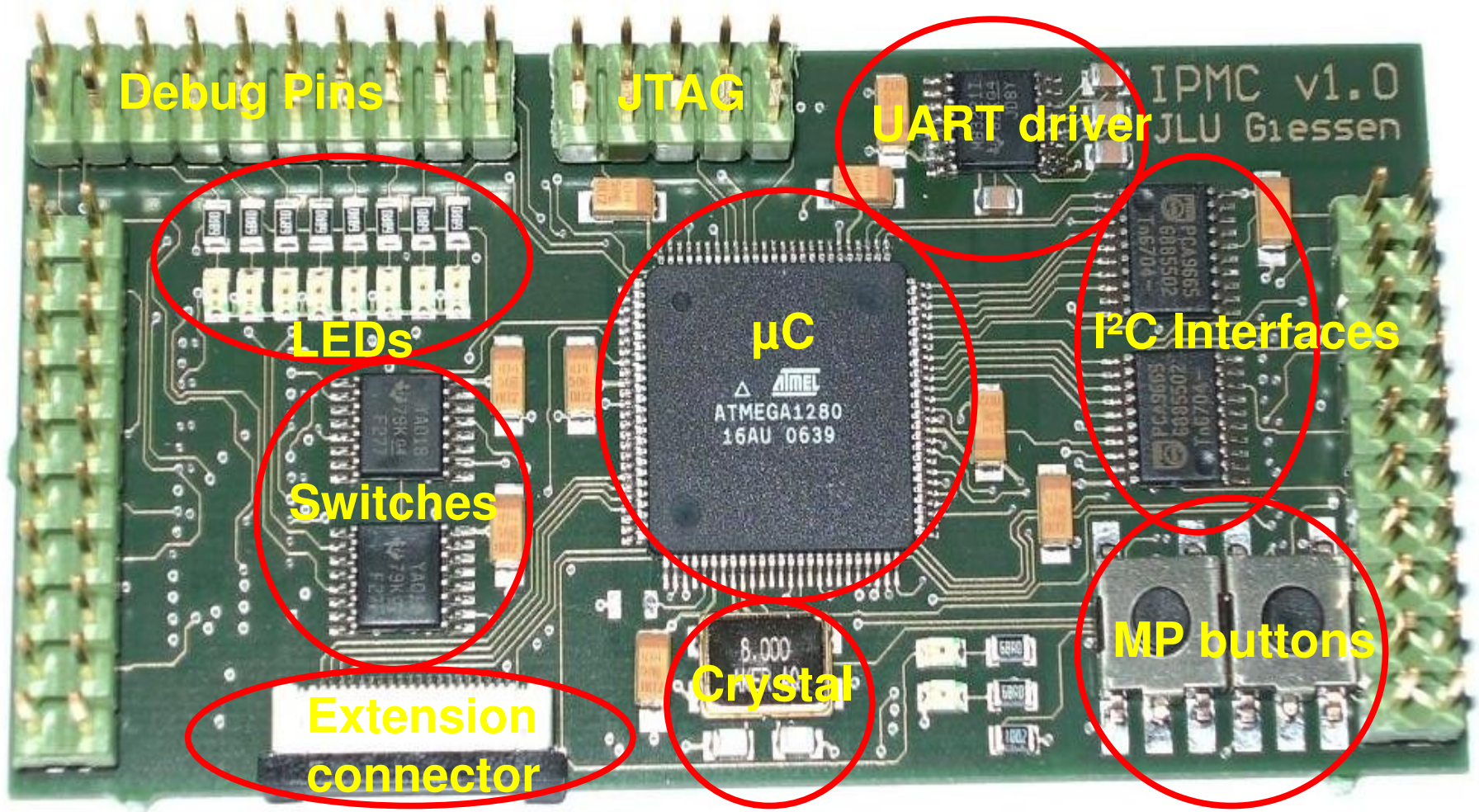


QSH-030-01-F-D-A

Schematic View of IPMC on CN



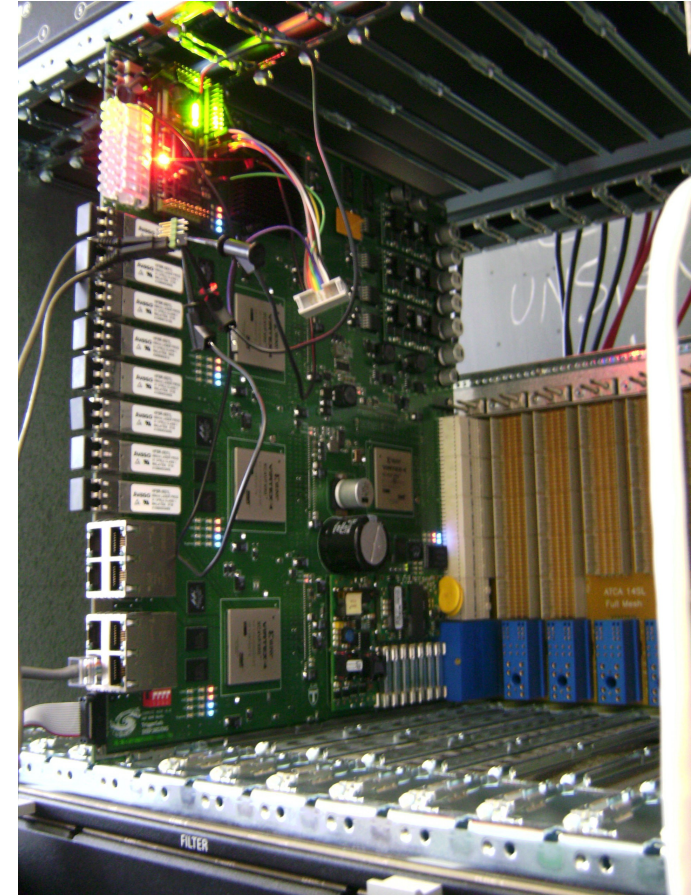
Prototype



35mm x 75mm 4 Layer board

Status / Outlook

- Add-on card fulfills ATCA related & custom needs
- Prototyp tested
 - JTAG programming of μC
 - Physical connections to CN
 - DC/DC control of CN
 - I²C signal transmission from SM
 - Reading of geometrical address from backplane
 - IPMC - FPGA bus
- Recently implementing I²C and necessary IPMI protocol





Thanks for your attention!

