

Demonstration of a First Prototype of the ATCA-based LLRF System at ACC4/5/6

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Goals

- **Demonstrate control of FLASH module(s) by ATCA-based LLRF system with beam**
- Verify in practice the principles of ATCA standard
- Evaluate software and hardware components
- Establish a test stand in ACC456 for the ATCA-based LLRF system development for X-FEL

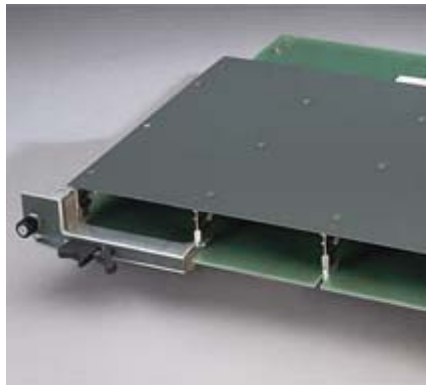
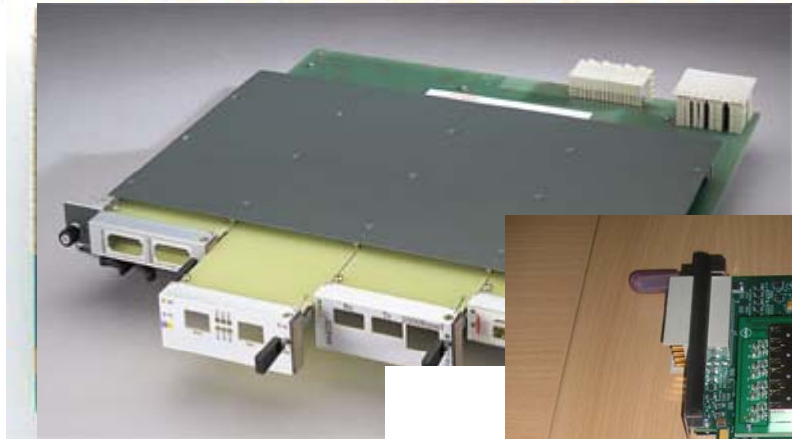
ATCA Standard



Advanced TCA[®]
Advanced MC[™]

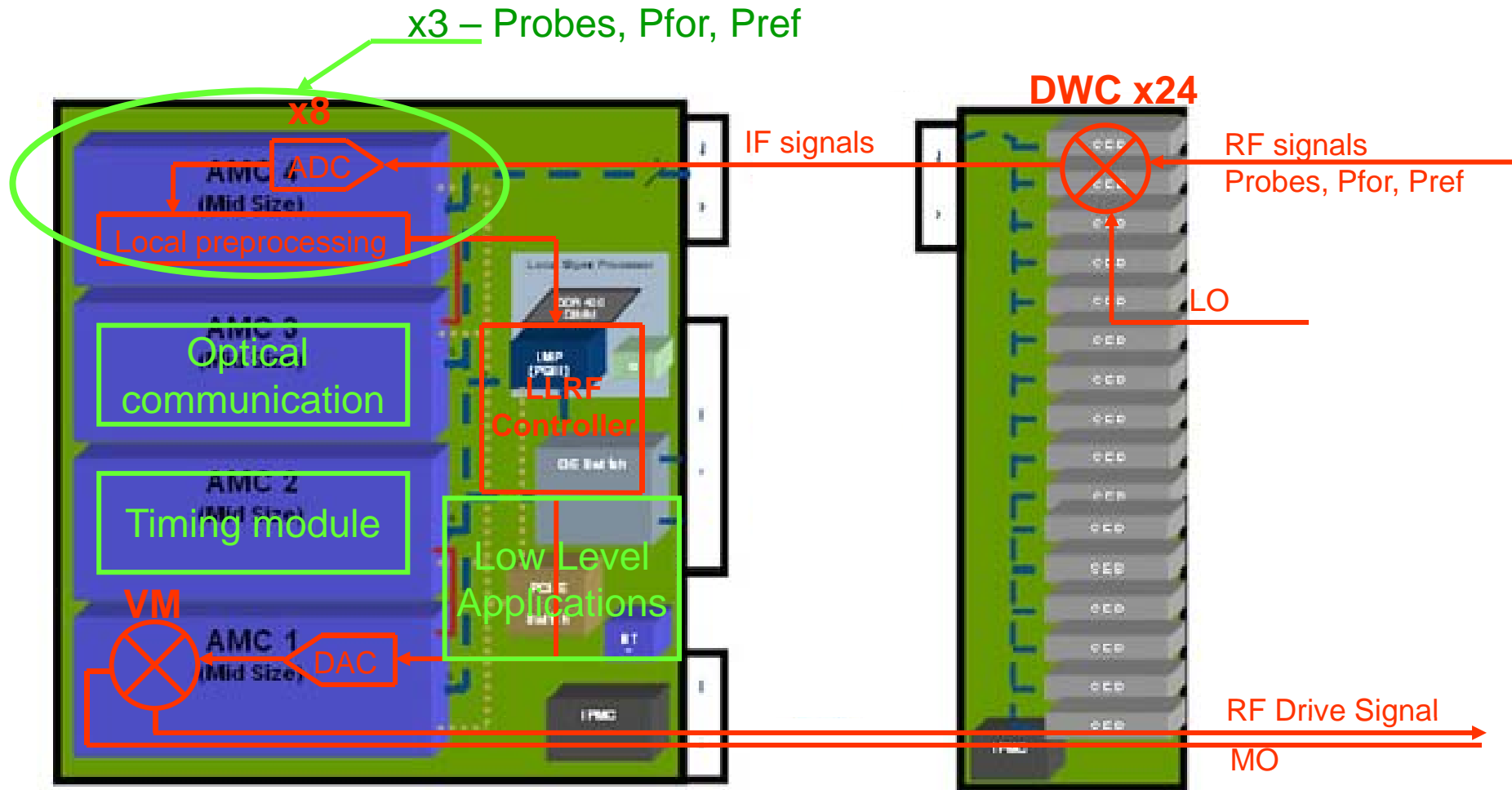
PICMG 3.0 – Advanced Telecommunications Computer Architecture

PICMG AMC.0 – Advanced Mezzanine Card



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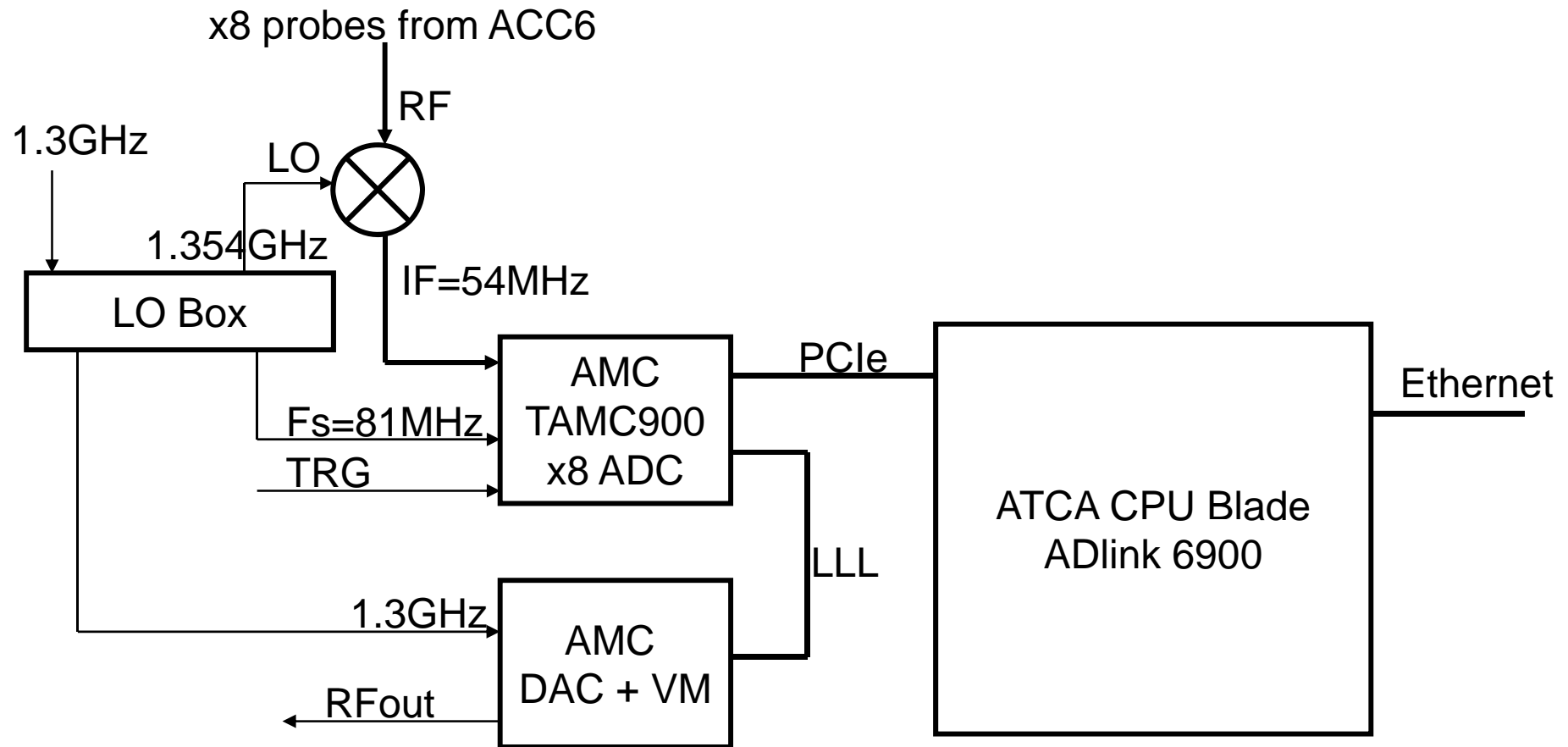
Architecture of the ATCA-based LLRF System



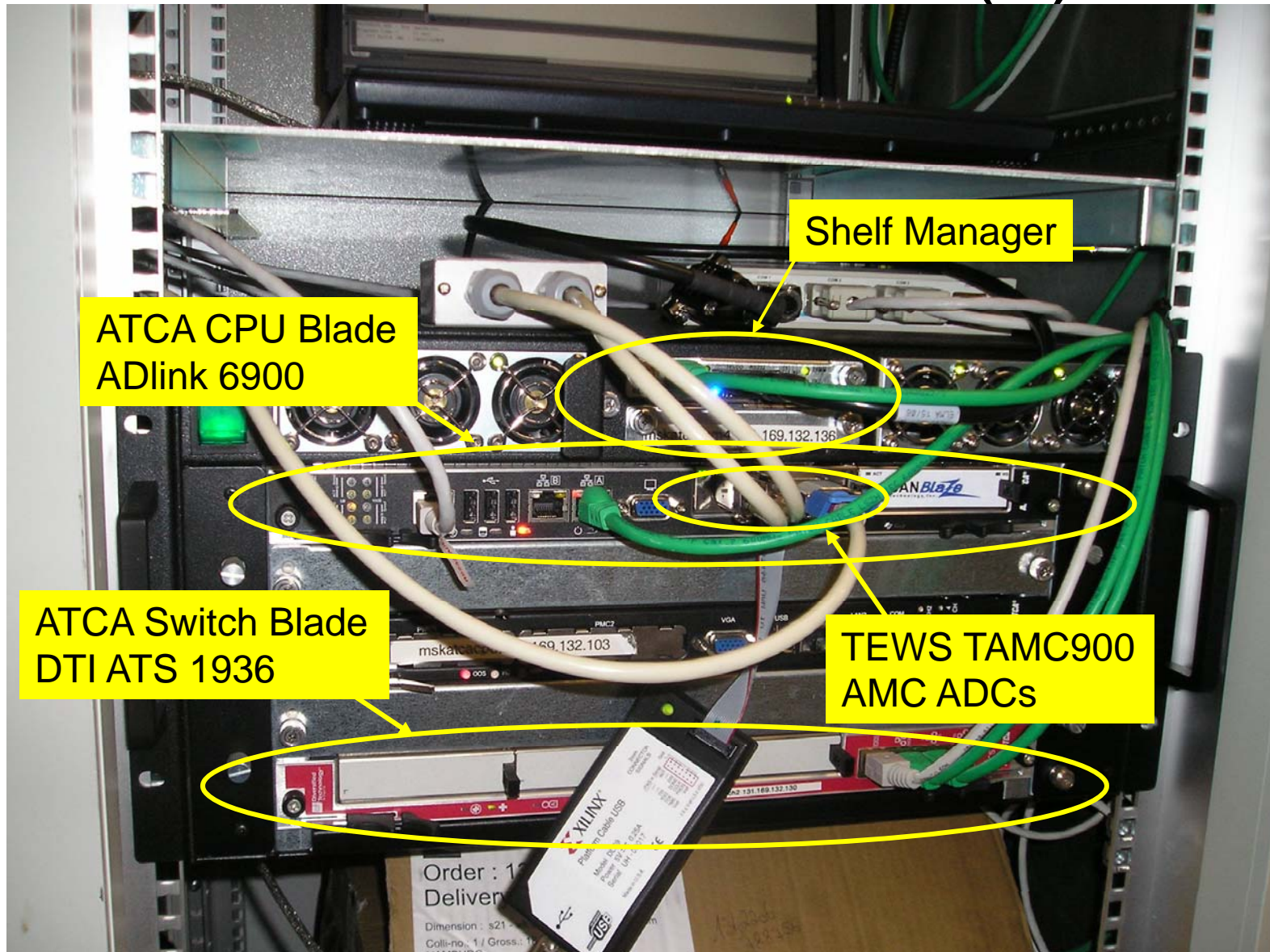
RF Station = One cryo module x4

Tests performed in January 2009

Hardware Block Diagram of ATCA-based LLRF System Installed in ACC456



Hardware Pictures (1)



Hardware Pictures (2)



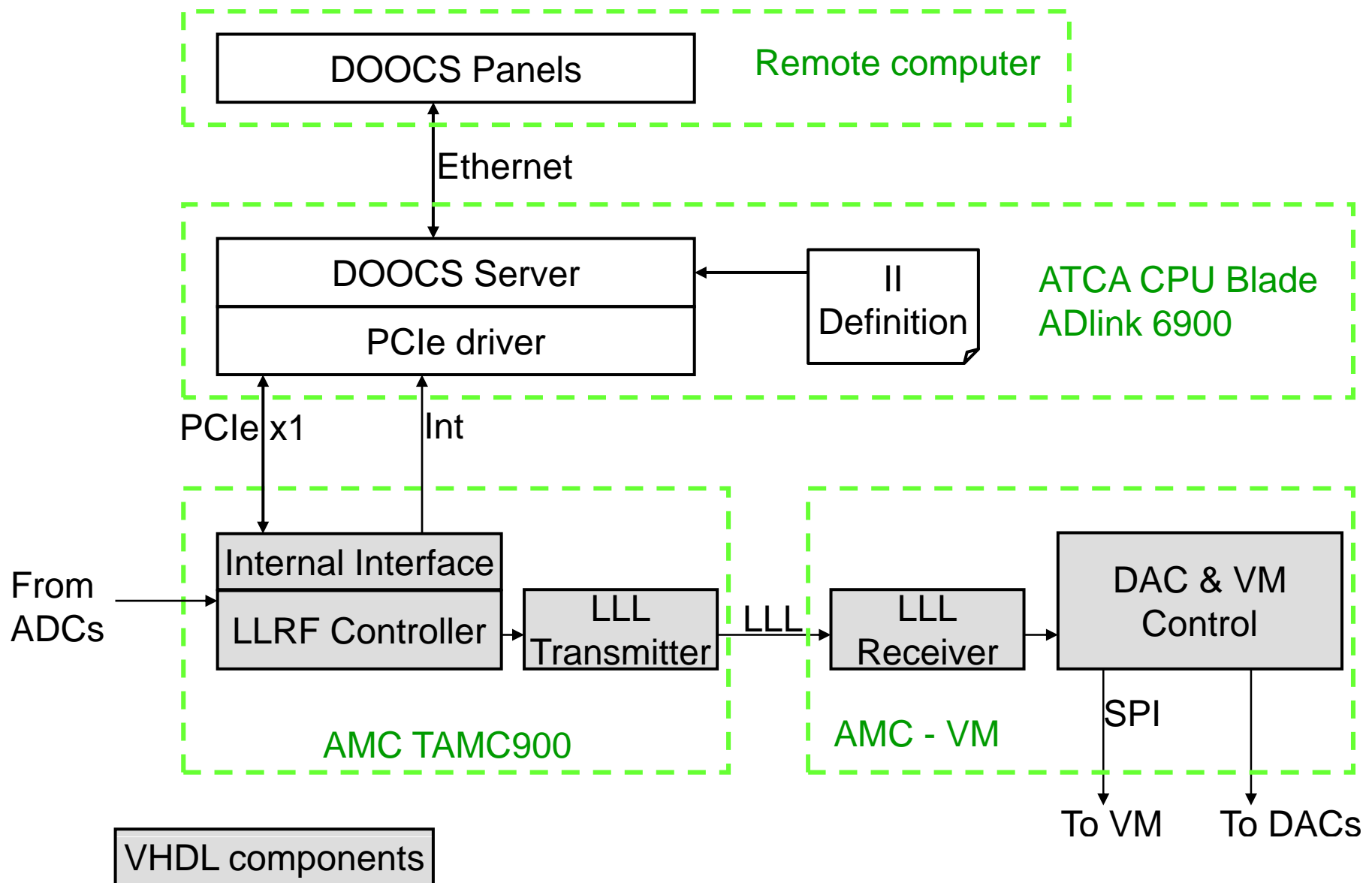
Analog tongue AMC-VM



Digital tongue AMC-B+

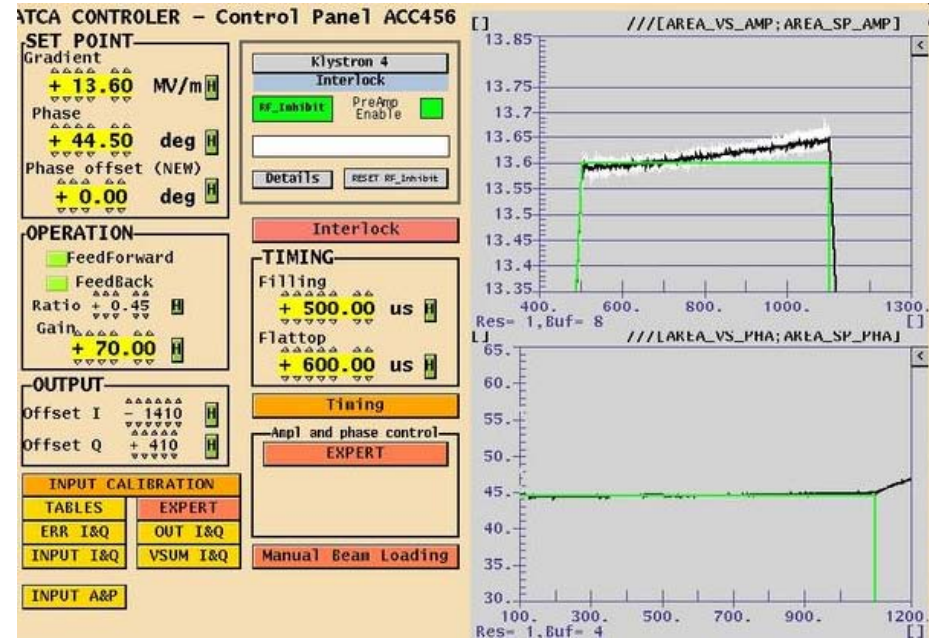


Software Block Diagram



Results:

- ACC4/5/6 driven by ATCA-based LLRF system
- Only ACC4 vector signals
- Feedback 110
- Beam through buncher



Difficulties:

- Too small RF signal level from VM
- 3x4 hours for tests
- Not working carrier blade from Radisys

Plans – request for time at FLASH

Plans:

- Install 3 downconverters from Cryoelectra
- Install 3 TAMC900 cards with ADCs
- Test with commercial carrier
- Test with DESY ATCA carrier

FLASH time required in 2009:

- Short time 3-4 hours during FEL studies (one cable needs to be switched)
- Tests with DESY ATCA carrier during accelerator studies in September

Thank you

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