

# 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

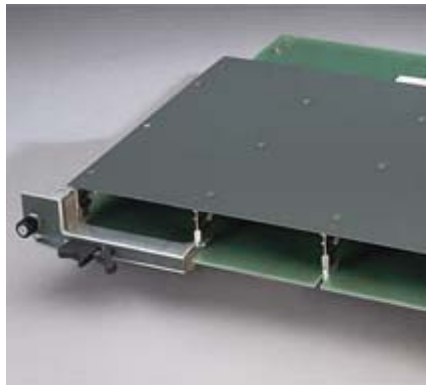
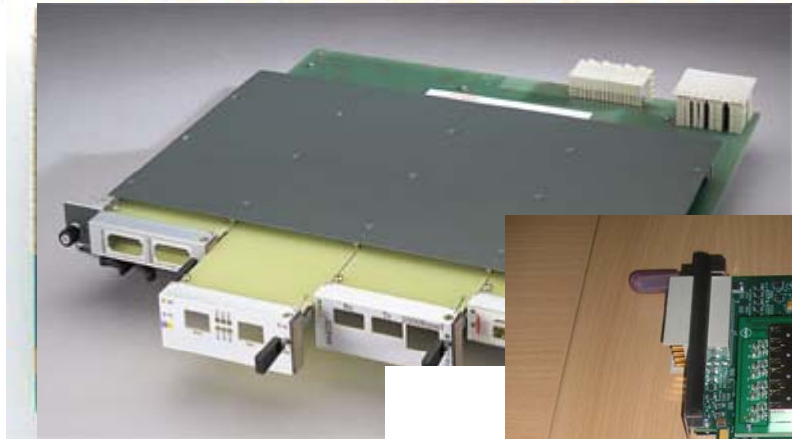
# ATCA Standard



**AdvancedTCA<sup>®</sup>**  
**AdvancedMC<sup>™</sup>**

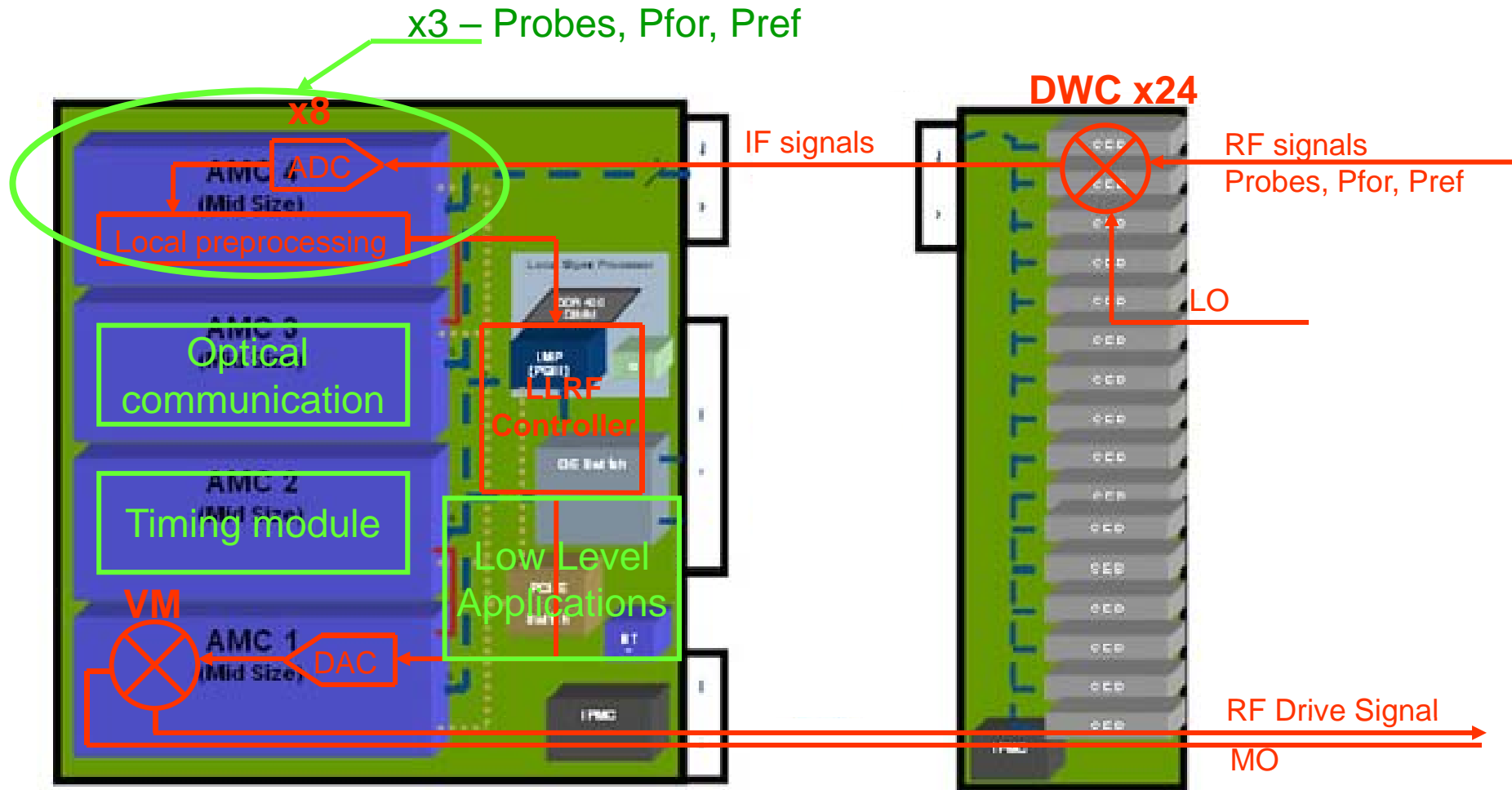
PICMG 3.0 – Advanced Telecommunications Computer Architecture

PICMG AMC.0 – Advanced Mezzanine Card



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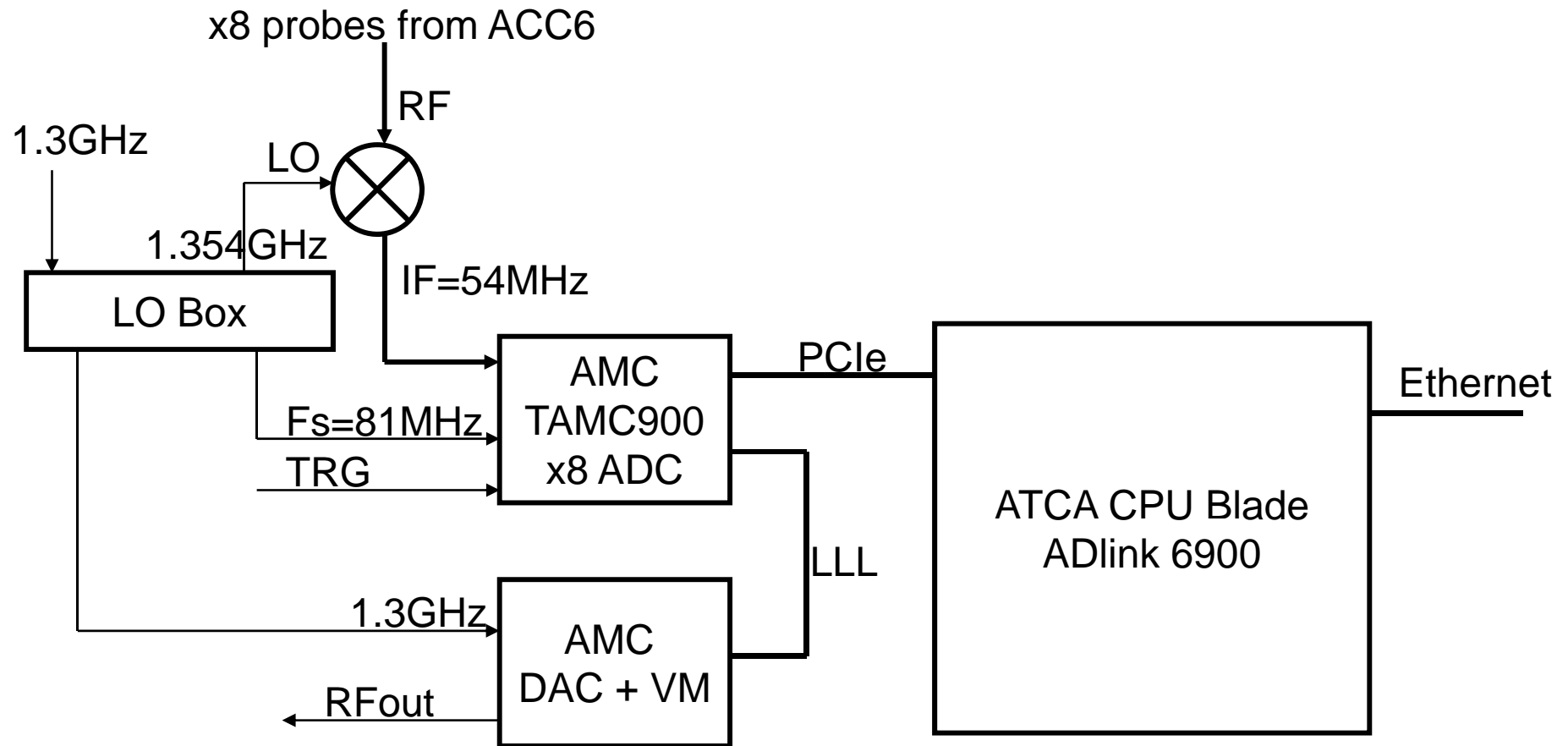
# Architecture of the ATCA-based LLRF System



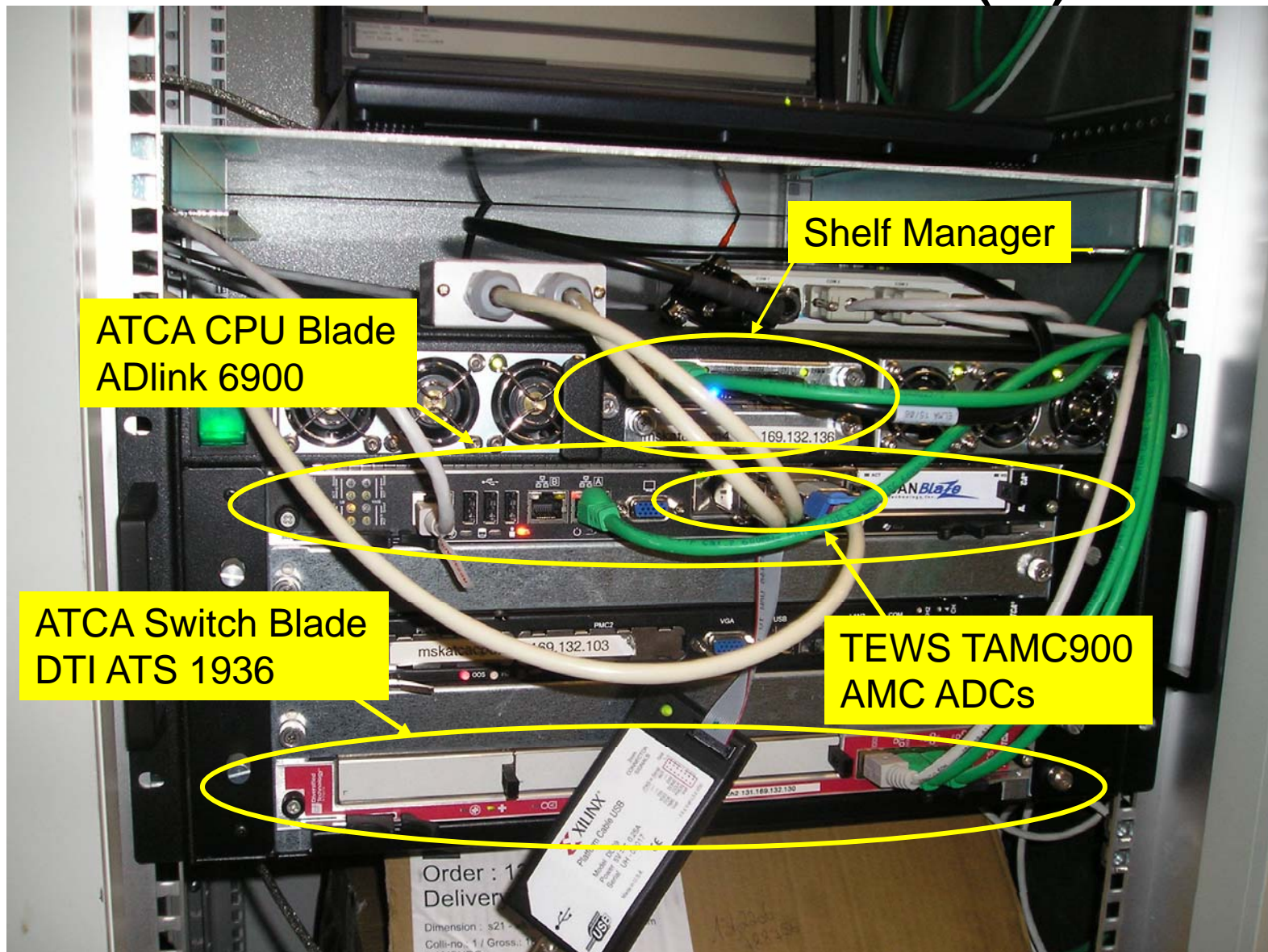
**RF Station = One cryo module x4**

# 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

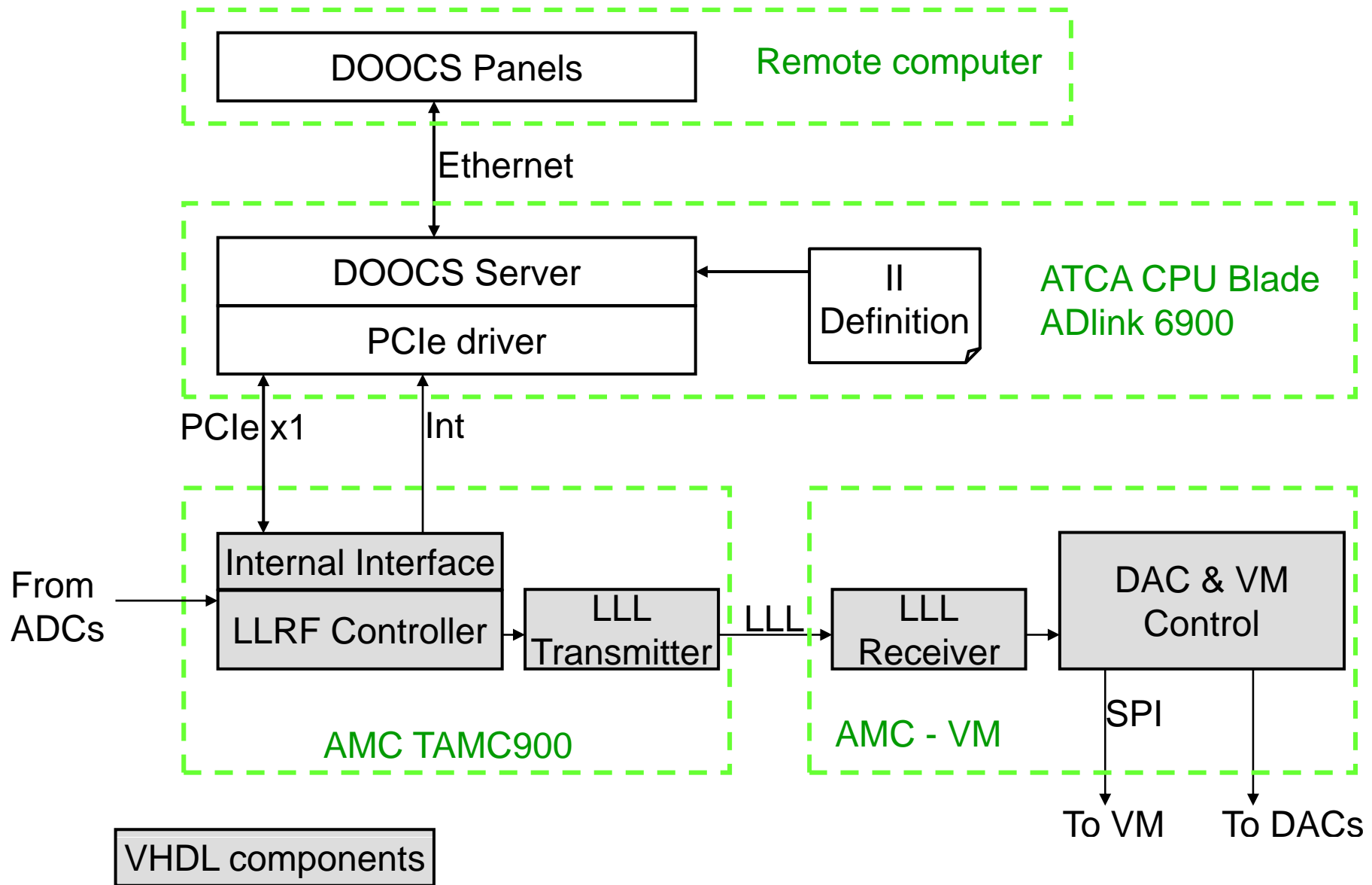


Digital tongue AMC-B+





# Software Block Diagram



## Results:

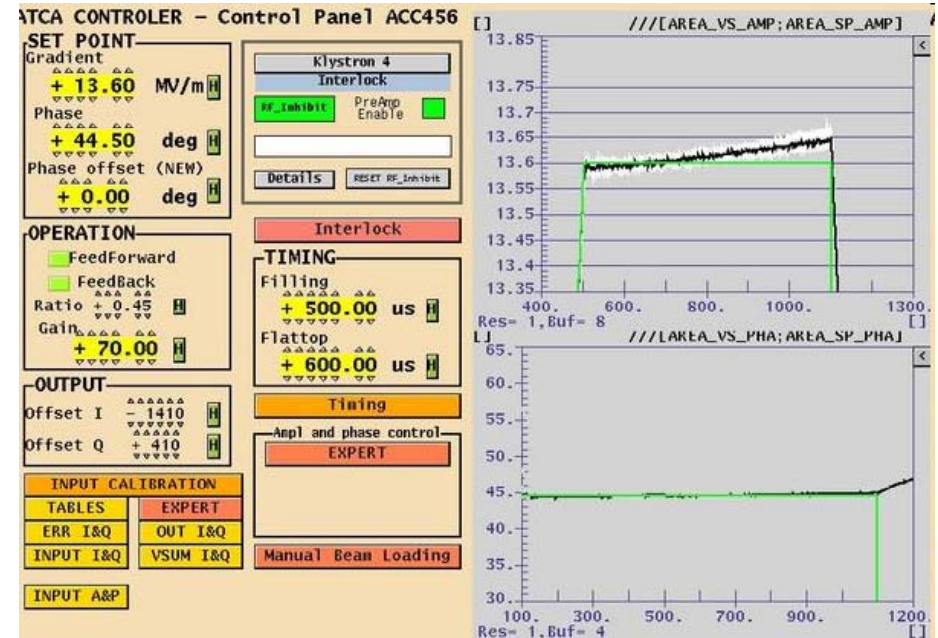
- ACC4/5/6 driven by ATCA-based LLRF system

- Only ACC4 vector signal



- 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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