

# Status Report on MTCA.4 based New Modular Controller for Astronomical Detectors (11th MTCAWS)

Public

# ELT Progress





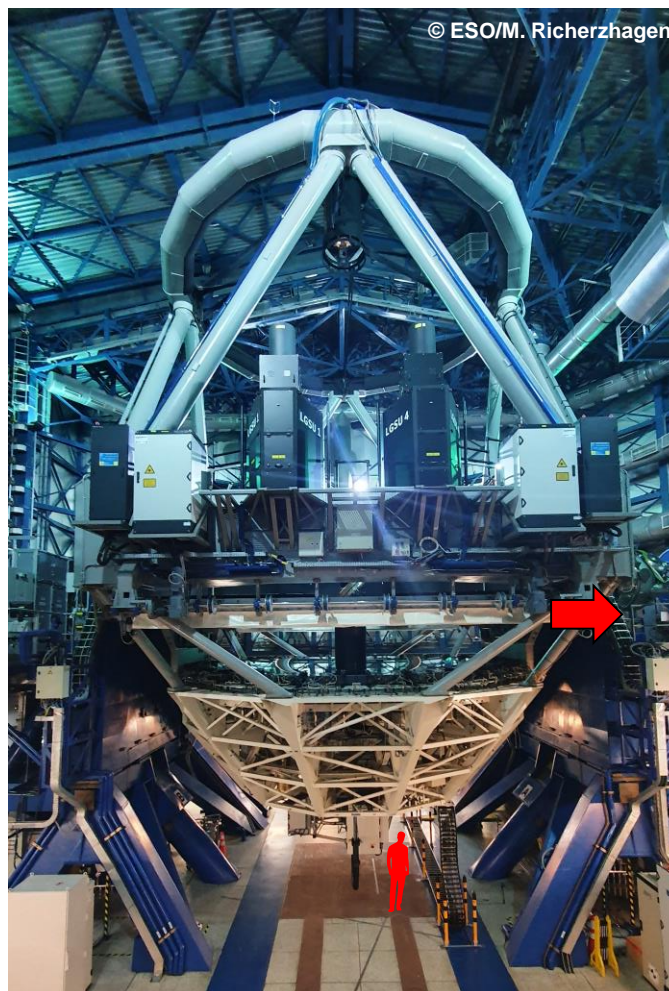
# First Light Reference System

- Replicate IRLOS Instrument (on UT4 of the VLT) in Garching



# First Light Reference System

- IRLOS
- Sub-instrument of MUSE
- Wavefront Sensor
- 1x SAPHIRA fast IR CMOS APD detector
  - 500Hz; 256x320px
- Detector Cryostat available in Garching





# Preamplifier and Cabling

- Cryostat internal circuits and cables identical to old system so A/B testing is possible.
- External cable uses new EN4165 connectors.





# NGCII Detector Controller



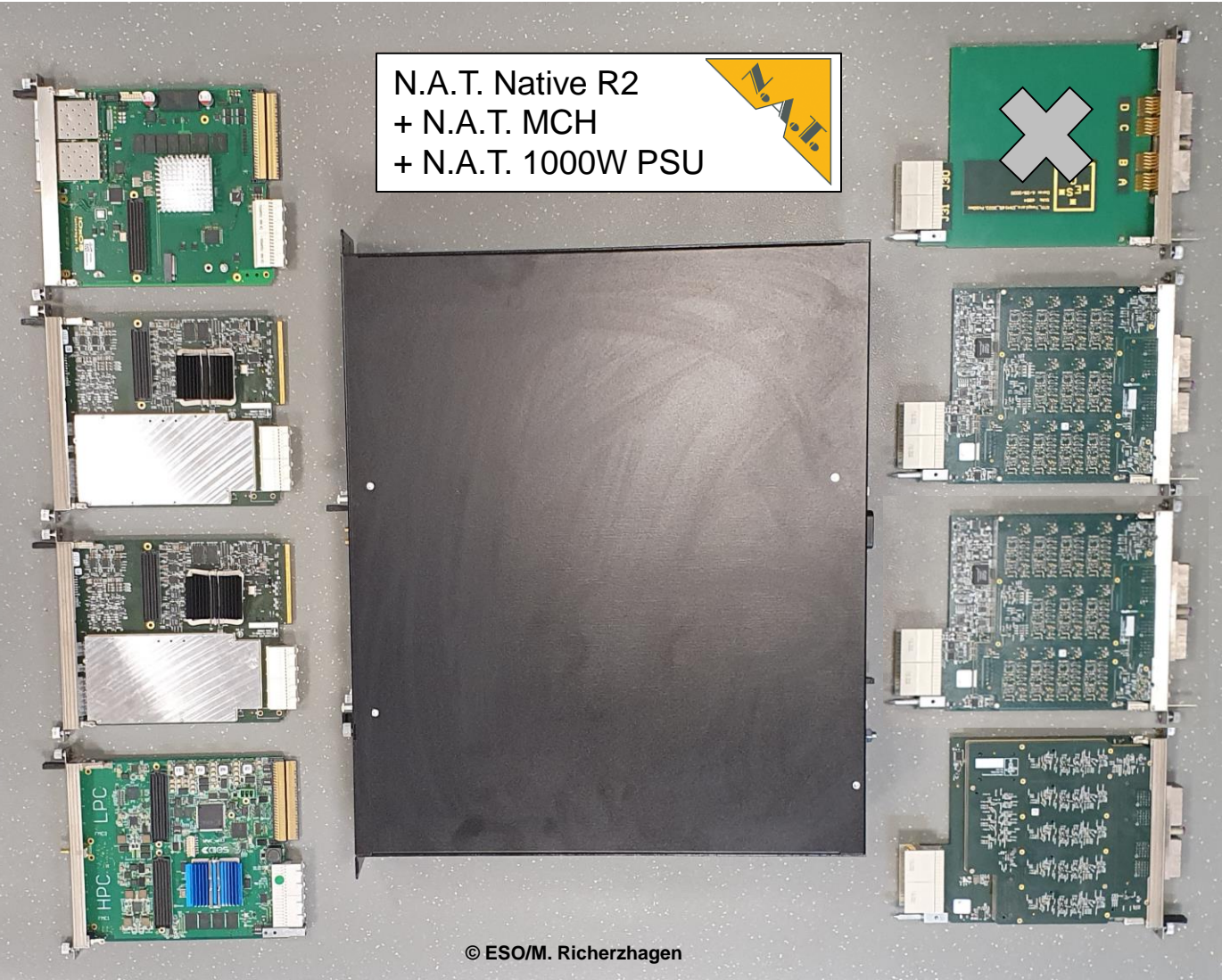
IOXOS IFC1414  
New Board for ESO  
Zynq US+ FPGA  
PROTOTYPE



2x AQ22 AMC  
ADC Module  
Artix FPGA  
In-house Dev.



AIES MFMC  
Artix FPGA



APD Bias RTM  
Negative APD Bias  
In development  
Not needed for first light

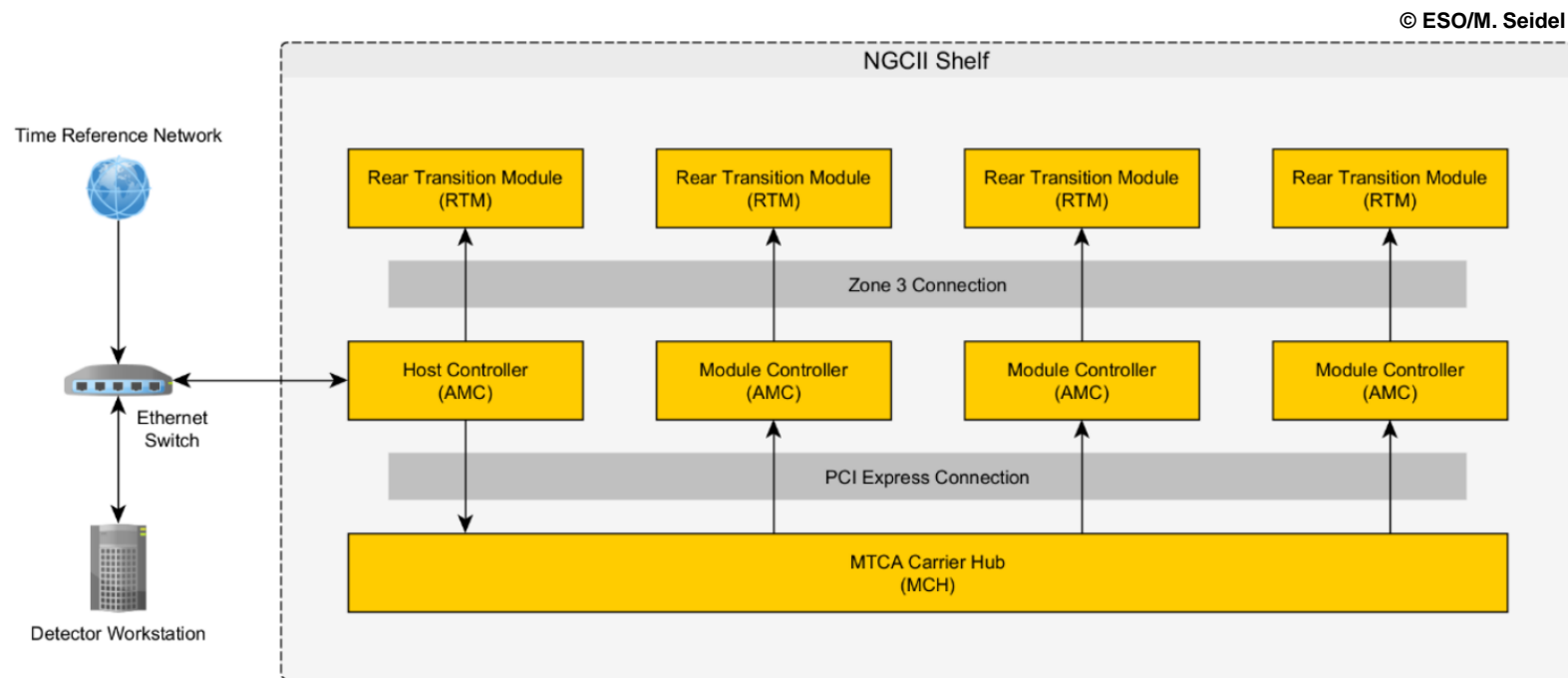


2x CMOS AQ22 RTM  
Signal Conditioning  
In-house Development



CMOS C20B20 RTM  
Clock + DC Bias  
In-house Development

- All intelligence in AMCs
- Host controller based on Zynq US+ module
  - PCIe Root Complex
  - 10GbE + 1GbE Interface
- Module controller on other AMCs
  - Clock Sequencer
  - Data Acquisition
- Custom ESO Linux image built for NGCII and other projects
- Taking shortcuts due to planning constraints



# Issues: Delivery Times

- Component Level Issues
  - FPGAs
  - Discrete Semiconductors
  - LVDS Interface ICs
  - AMC card-edge connector obsolescence does not affect us
  - Ordering components 1 year ahead of planned production
- COTS Module Issues
  - Host controller (Zynq US+) is delayed
  - IOxOS provided a prototype for us
  - Temporarily substituting with CAENels FMC2ZUP which does not meet our Zone 3 requirements.
- Documentation Availability



# Issues: MTCA.4 Management

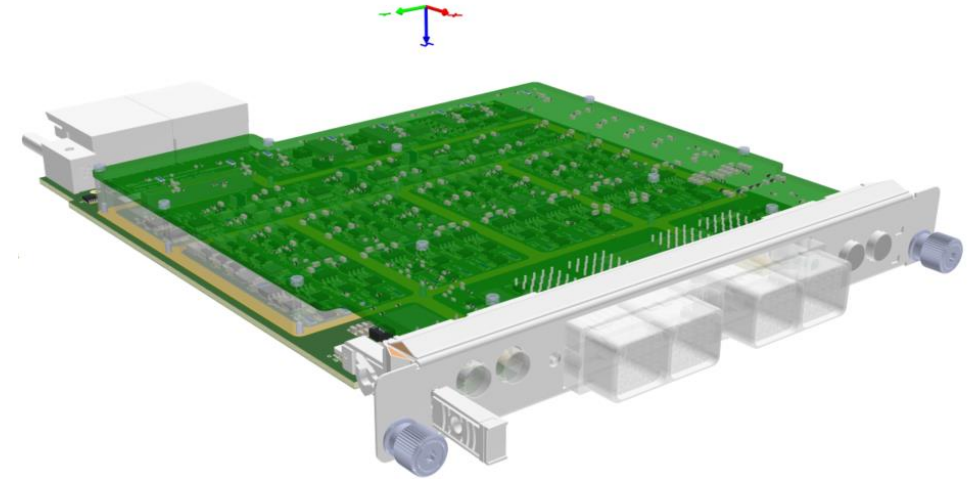
- Underestimated compatibility issues
- Using 3 different MMC controllers
  - DESY DMMC Stamp on ESO AQ22 AMC
  - AIES MFMC proprietary MMC
  - IOXOS IFC1414 proprietary MMC
- RTM / FMC management interface definition is diffuse in specifications.
  - Specifically, sensor configuration which is requiring intervention in MMC



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# Perspective

- Achieve first light with CMOS detector
  - Later: add APD bias
- Work on modules for first light of CCD detector:
  - CCD C24 RTM (24x variable clock)
  - CCD B24 RTM (24x 15V/30V bias)
  - CCD AQ8 RTM (8x CCD specific AQ channel)
- Revision 2 and series production of modules





# Q&A



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