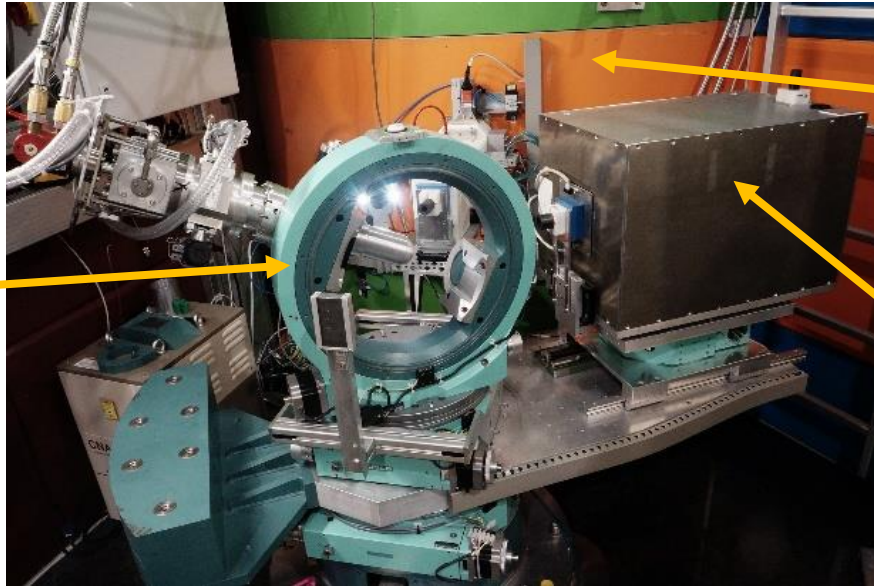


SYNCHRONIZATION BETWEEN DETECTOR AND MOTION IN A NEUTRON INSTRUMENT

H. Kleines, F. Suxdorf, M. Meven, W. Luberstetter, G. Brandl; JCNS-2, Forschungszentrum Jülich, Germany

Eulerian
Cradle



Mono-
chromator

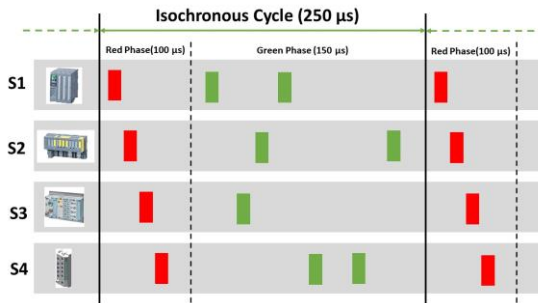
Detector



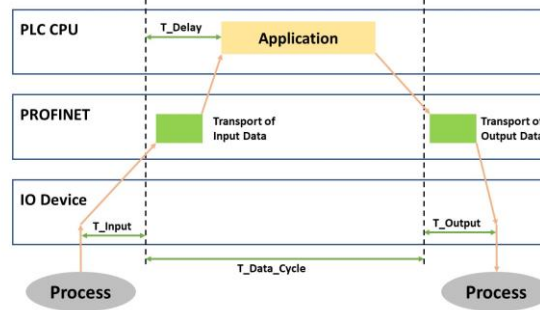
- Hot single crystal neutron diffractometer HEiDi
 - Operated by RWTH Aachen and Forschungszentrum Jülich at fission reactor FRM II
 - Motion electronics: Siemens S7-1500 PLC + ET200S decentral periphery
 - Detector: ^3He detector tube
- **GOAL: movement during measurement**

TOOLBOX IN THE SIEMENS S7-1500 ENVIRONMENT

Profinet IRT



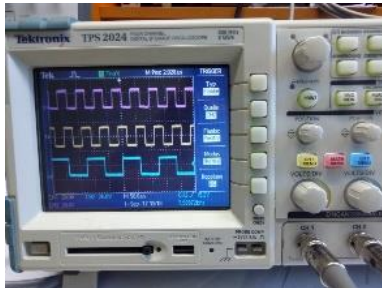
S7-1500 isochronous mode



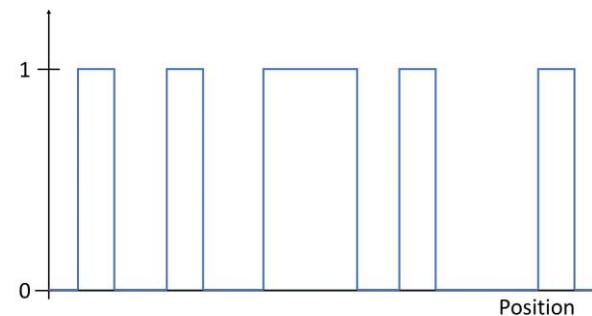
Time-based IO



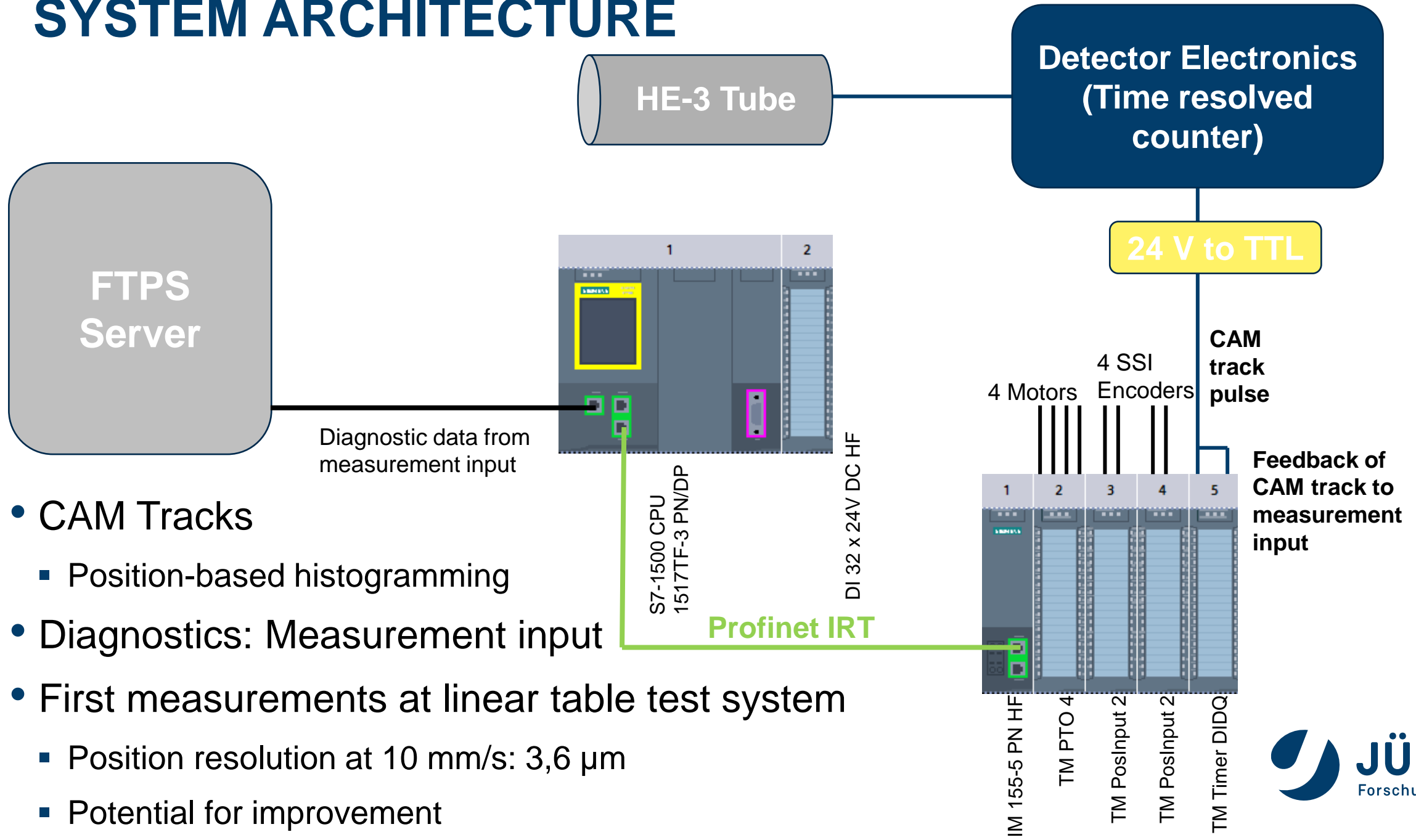
Electronic Gearing



CAM Track and Measurement Input



SYSTEM ARCHITECTURE



- CAM Tracks
 - Position-based histogramming
- Diagnostics: Measurement input
- First measurements at linear table test system
 - Position resolution at 10 mm/s: 3,6 μm
 - Potential for improvement