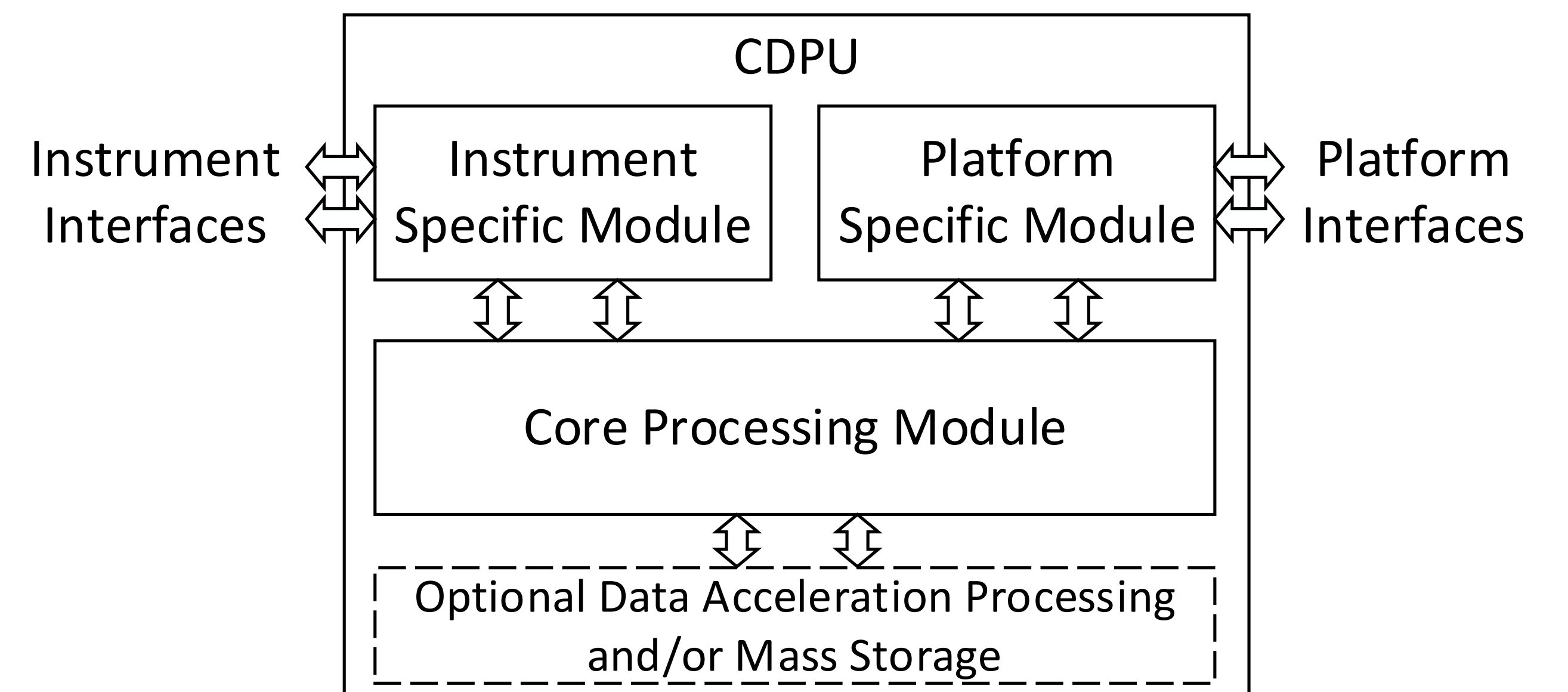


payload Control & Data Processing Unit for SmallSats

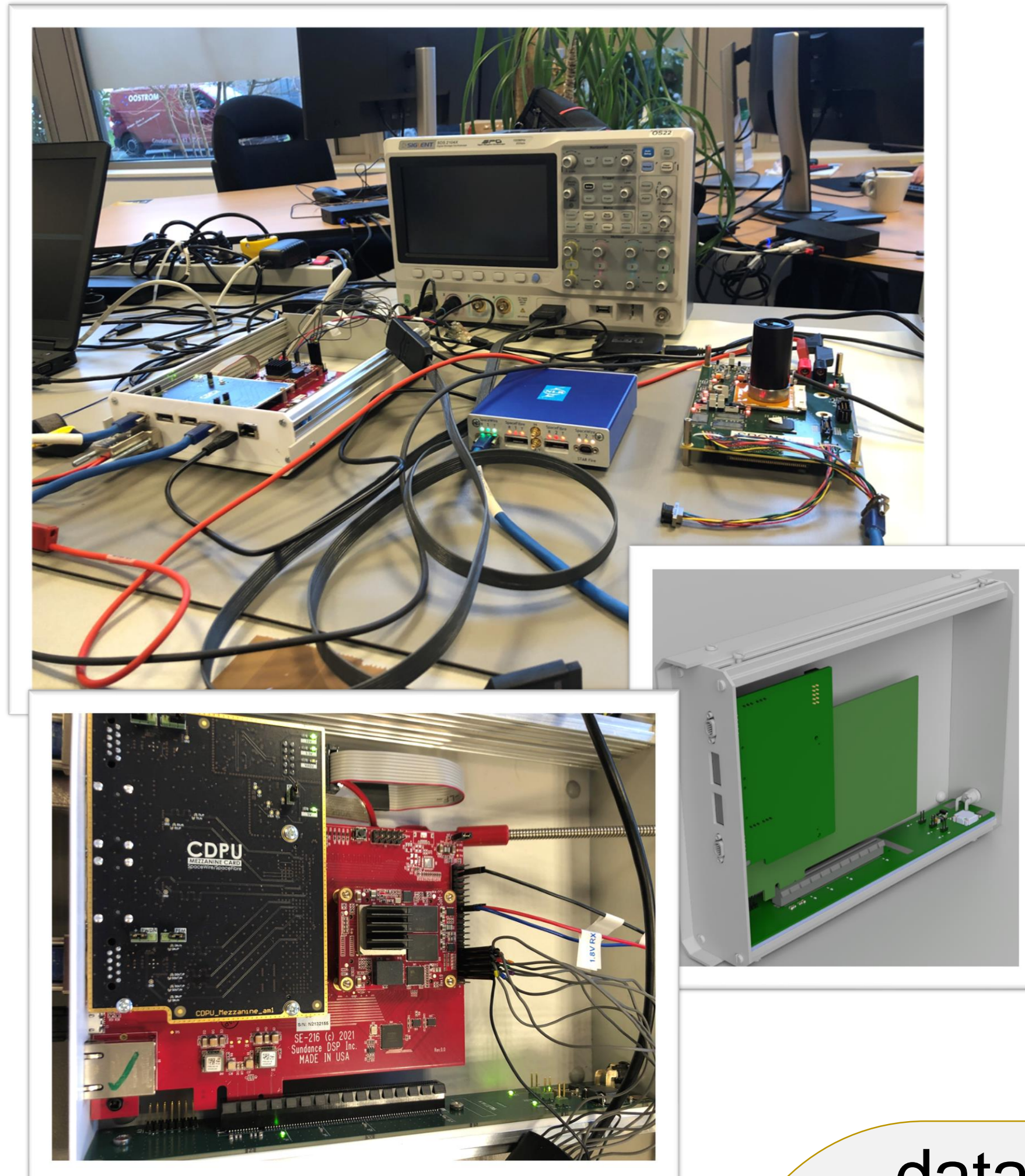
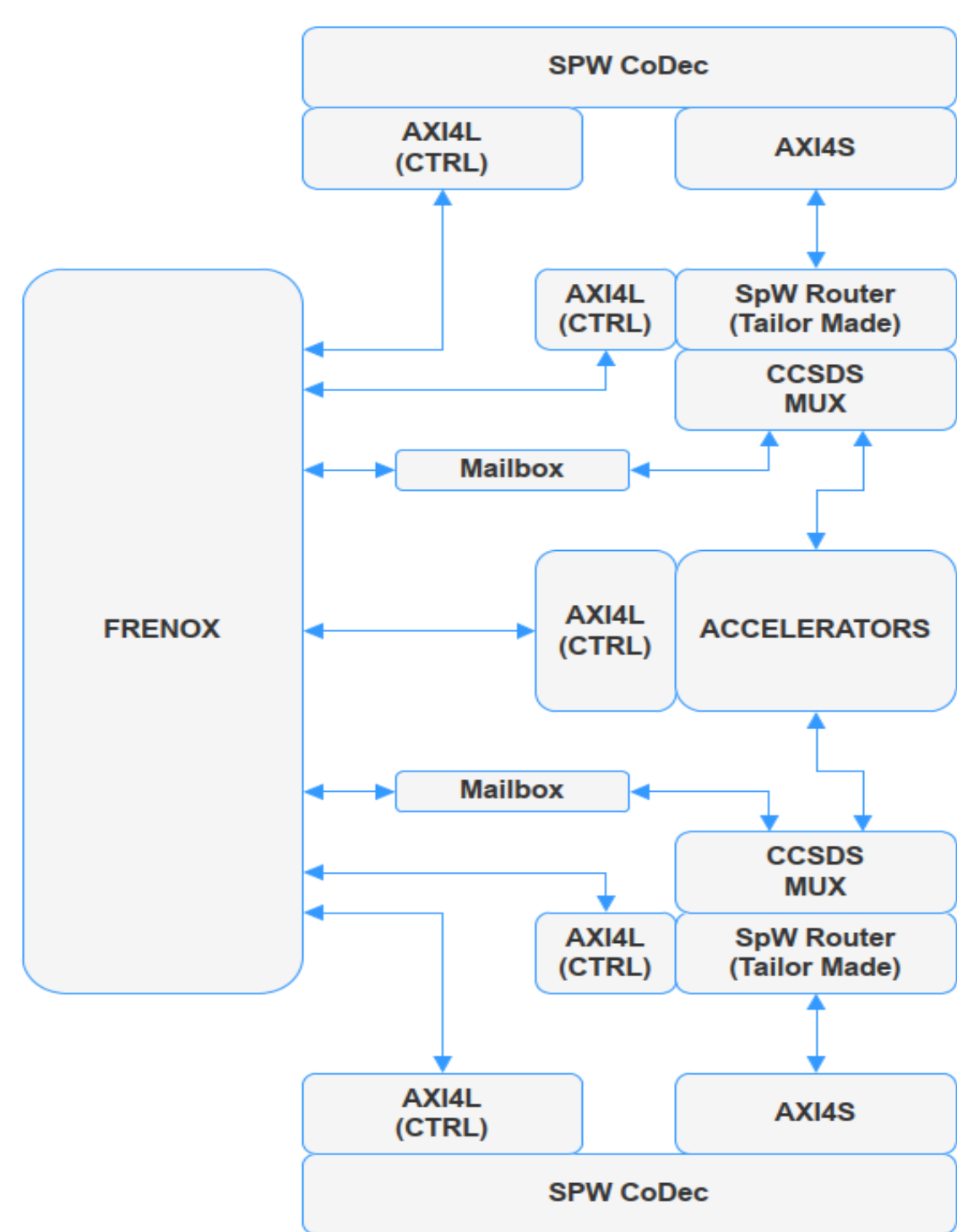
Gerard Rauwerda (Technolution, The Netherlands), Sybren de Jong (NLR, The Netherlands)

CDPU offers flexibility and reduced Time-to-Orbit

- Flexibility at design-time
- In-orbit reconfigurability
- In-orbit edge computing (image processing, encryption, instrument autonomy)
- >5 years in-orbit life-time (LEO)



Trade-off: COTS | Rad.-tolerant | Rad.-hardened



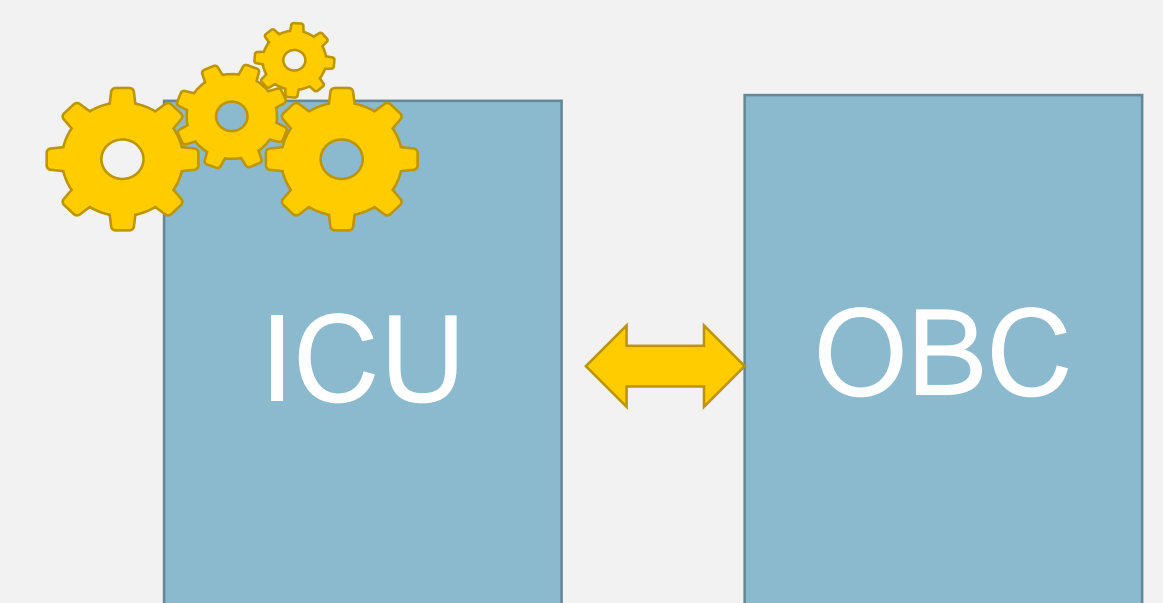
CDPU base-line design:

- FreNox RISC-V
- SpW interface IP
- SpFi interface IP
- AXI Interconnect infrastructure
- Accelerator support

Implemented in PolarFire FPGA

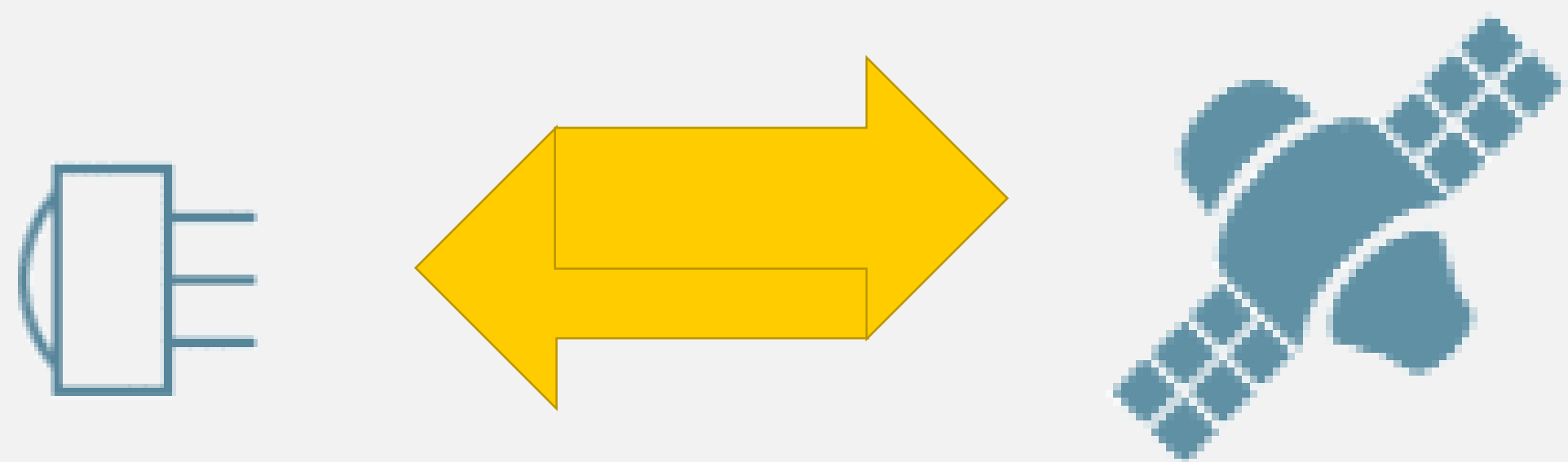
- Successfully tested with 4Mpx camera head (3D PLUS)

data rate | bandwidth | latency

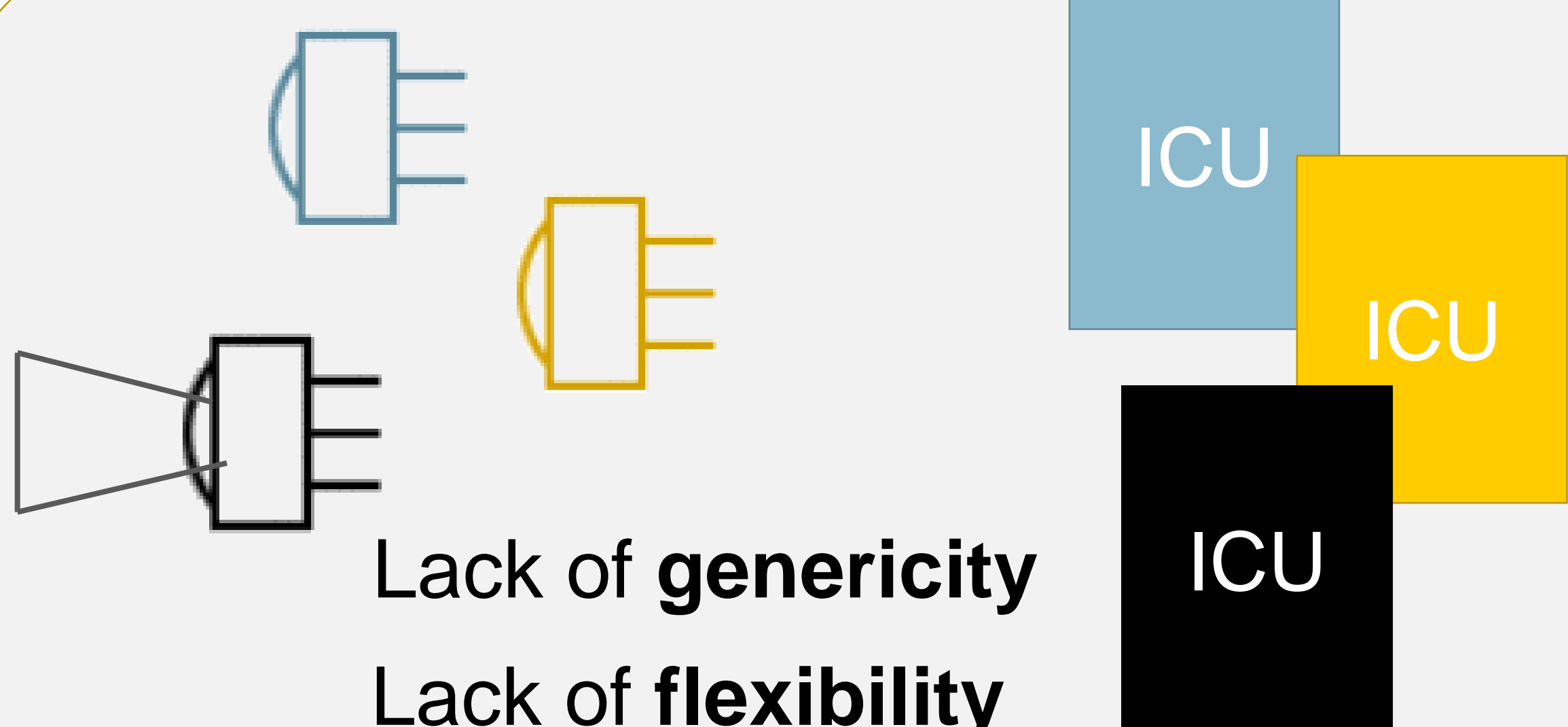


Lack of edge processing

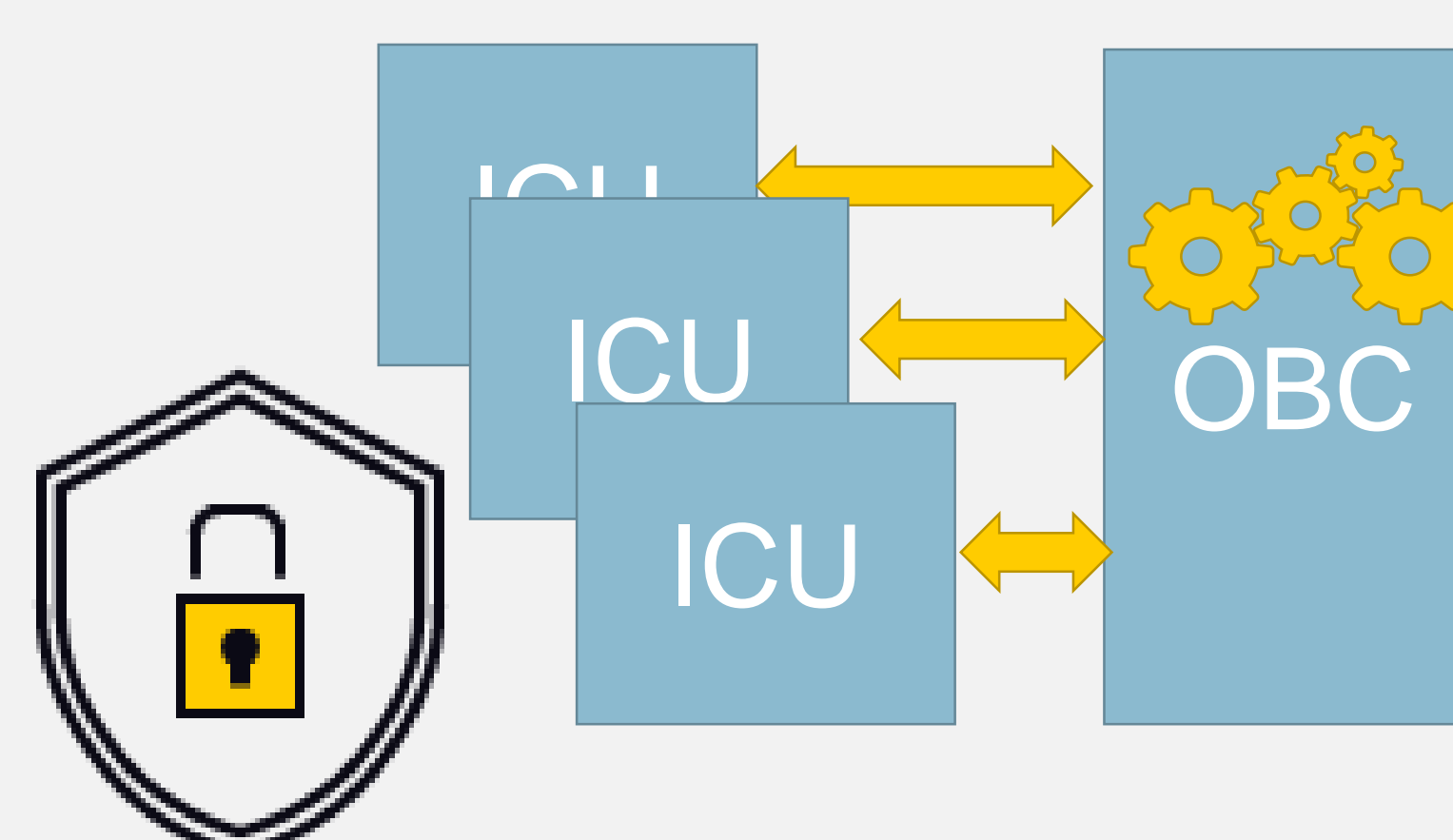
Challenges to address for NewSpace SmallSat



Dependency on platform



Lack of genericity
 Lack of flexibility



No separation of concerns
 No data encryption