

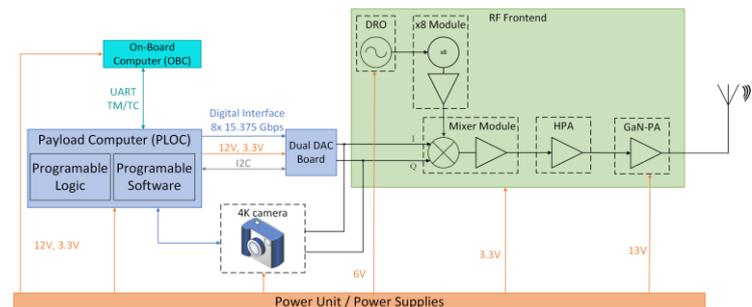
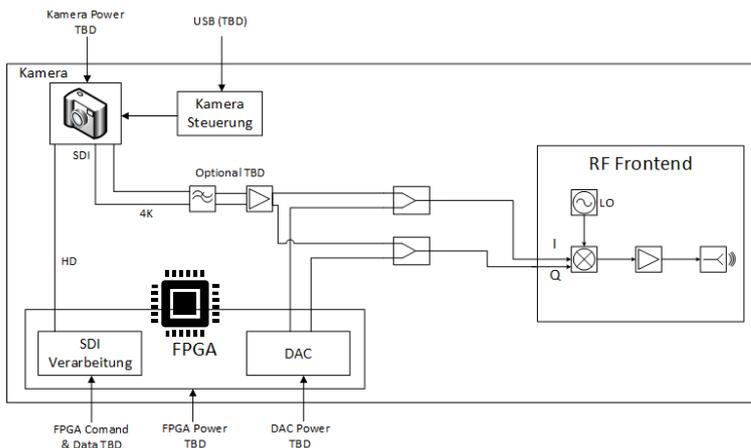
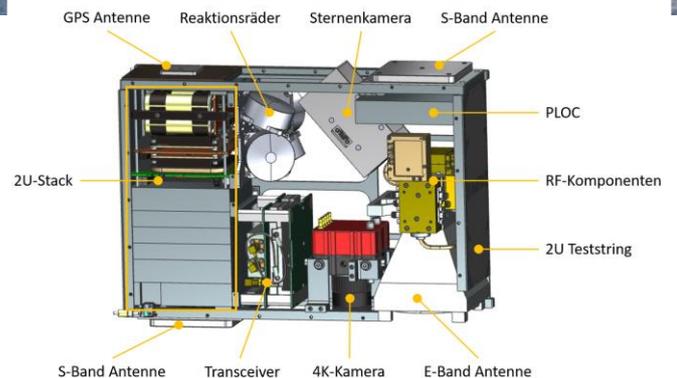
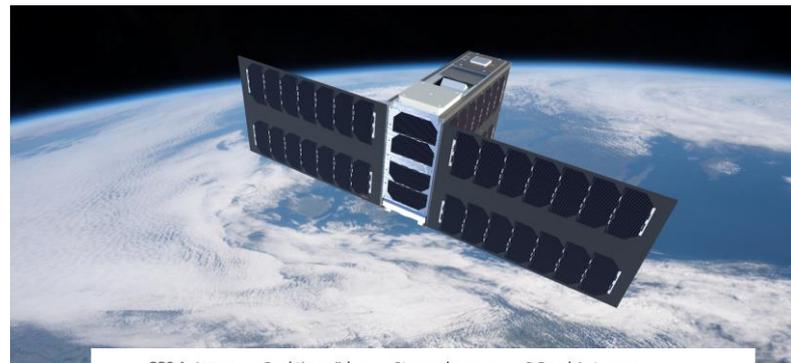
## Bachelor/Research/Master Thesis – Bachelor-/Forschung/Master-Arbeit

### Project:

In the framework of the EIVE Project the Institute of Robust Power Semiconductor Systems (ILH) is developing a 6-Unit CubeSat, flying in the Low Earth Orbit (LEO). Image compression algorithms have to be efficiently implemented in Programming Logic (FPGA) and Programming Software (CPU).

### Scientific Mission:

- (1) PRBS transmission with various modulation schemes (QPSK, n-QAM, ...) and different data rates for in-depth data-link analysis;
- (2) E-Band Link Budget calculation, considering all the atmospheric effects;
- (3) Download high resolution images stored on-board for Earth observation applications.



### Your Tasks:

1. Investigate different image compression algorithms;
2. Implement on the FPGA and on the CPU the selected algorithms and draw the conclusion about the energy efficiency and feasibility;
3. Analyze the trade-off between the image compression quality, image transmission rate, power/resources consumption.
4. Optional: Implement the decoder (decompressor) in the base station receiver.

### Your Qualifications:



- Hands-on experience in developing FPGA algorithms;
- Familiar with software development: VHDL and/or Verilog, Xilinx Vivado;
- Passionate for producing high-quality, space-ready and well-tested code;
- Knowledge of RF circuit design is advantageous;
- Knowledge of communication protocols is an asset;
- Availability for team working is required.

