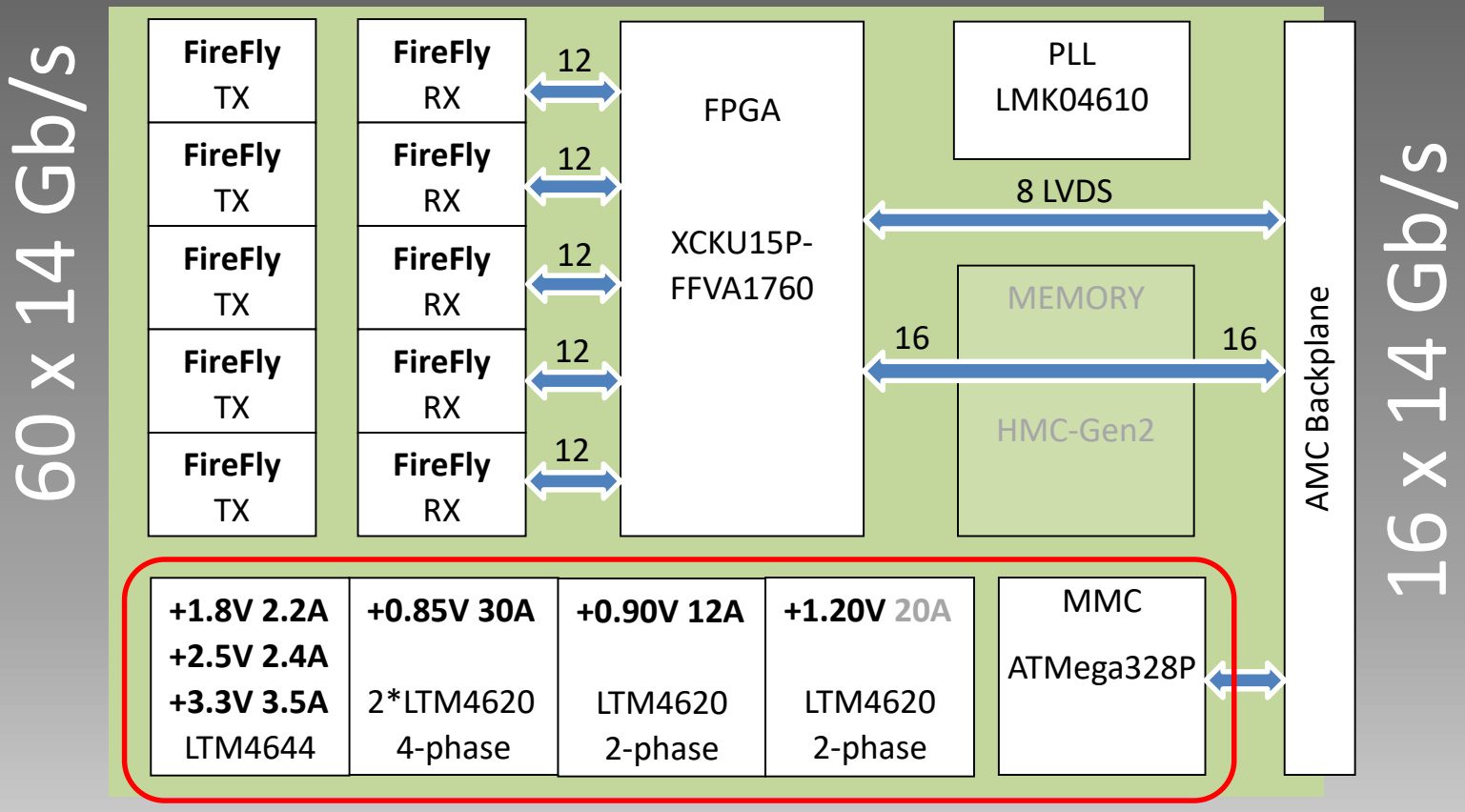
Status of the DAQ electronics for the PANDA - From Uppsala

- PANDA DC
- LVDS ROB
- Crate Electronics
  - Backplane
  - Power Supplies
  - Crate Controller

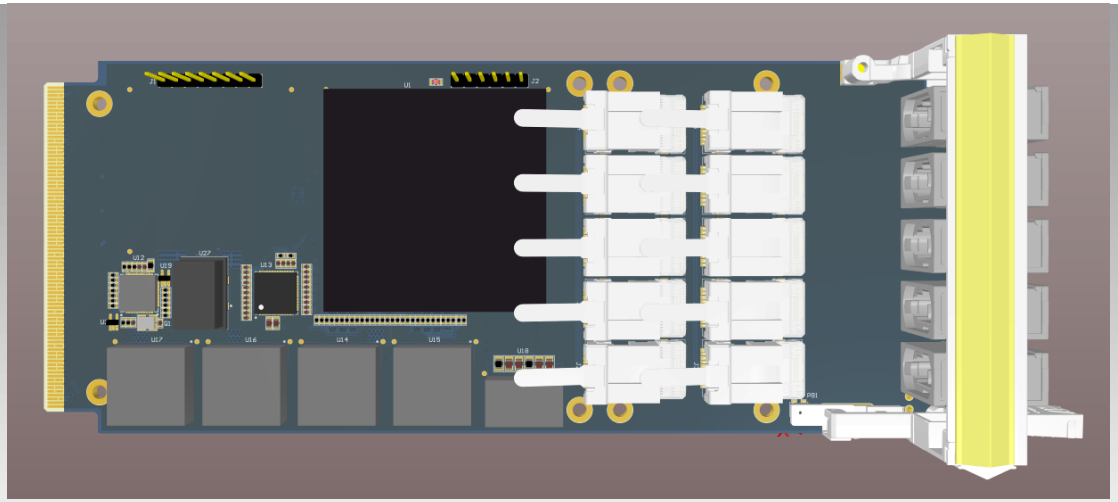
Panda DC


60 x 14 Gb/s
FireFly TX
FireFly TX
FireFly TX
FireFly TX
FireFly TX
FireFly RX
FireFly RX
FireFly RX
FireFly RX
FireFly RX
12
12
12
12
12
FPGA
XCKU15P-FFVA1760
PLL LMK04610
8 LVDS
MEMORY
HMC-Gen2
16
16
AMC Backplane
16 x 14 Gb/s
+1.8V 2.2A
+2.5V 2.4A
+3.3V 3.5A
LTM4644
+0.85V 30A
2*LTM4620
4-phase
+0.90V 12A
LTM4620
2-phase
+1.20V 20A
LTM4620
2-phase
MMC
ATMega328P

Status

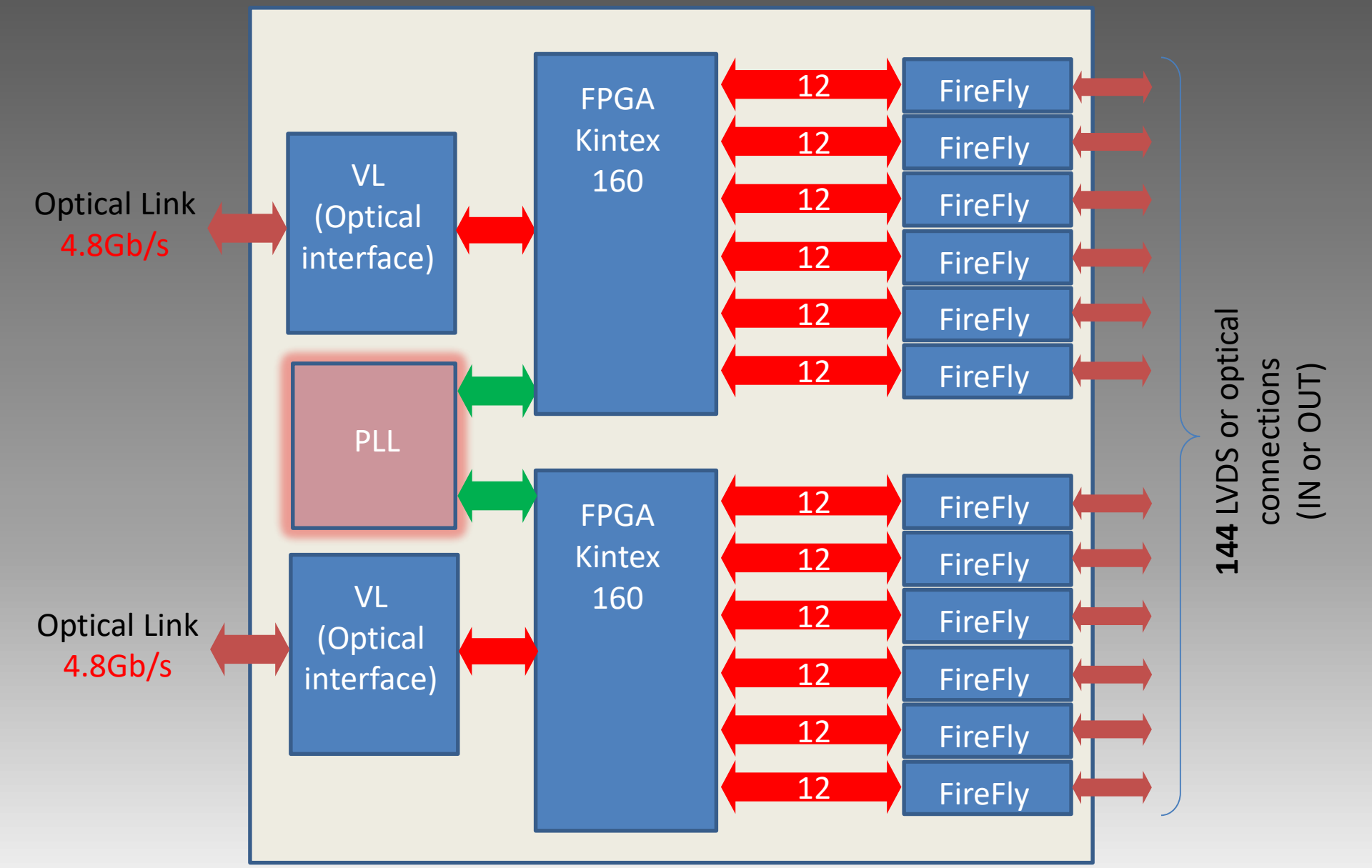
1. The device is in production. Delivery of the first assembled device is scheduled: 30.11.2020
2. The FPGAs are purchased (10 pcs)
3. The FireFly modules (non-standard pig-tail lengths) are purchased
4. Remaining is:

   Testing and programming



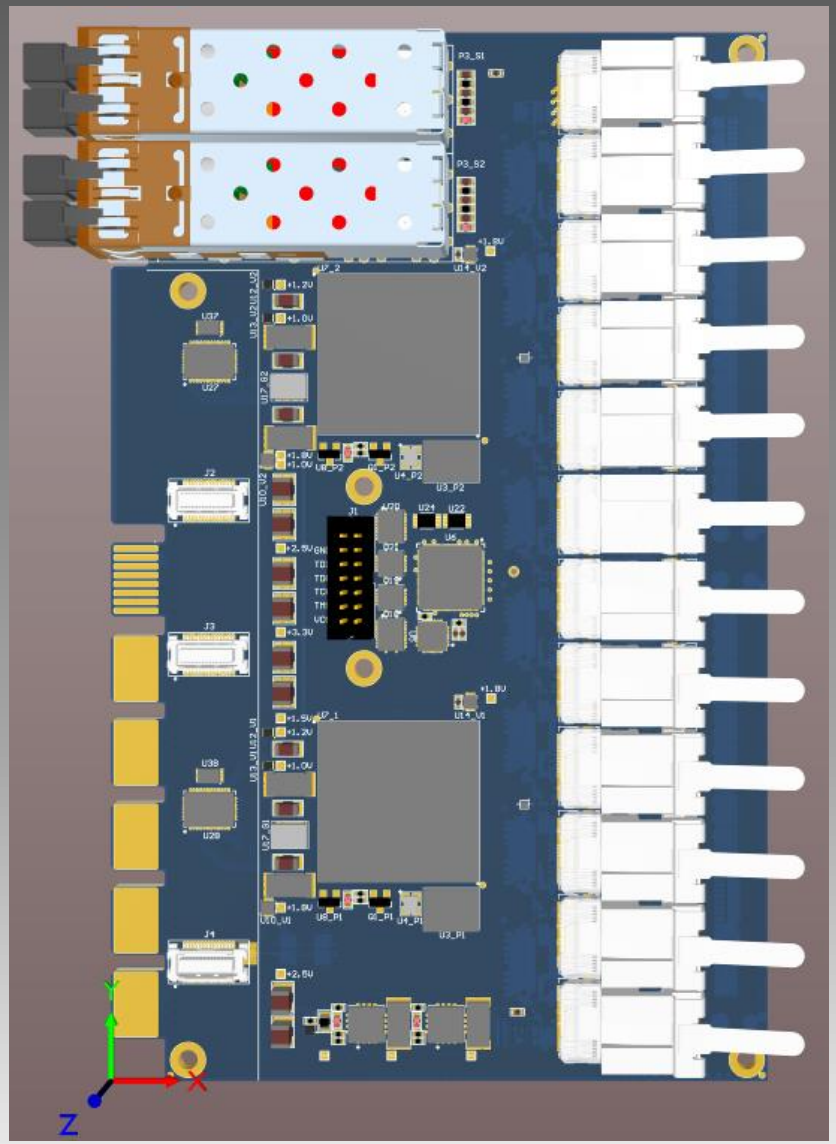
EMC Barrel Electronics

- LVDS ROB



EMC Barrel Electronics

- LVDS ROB

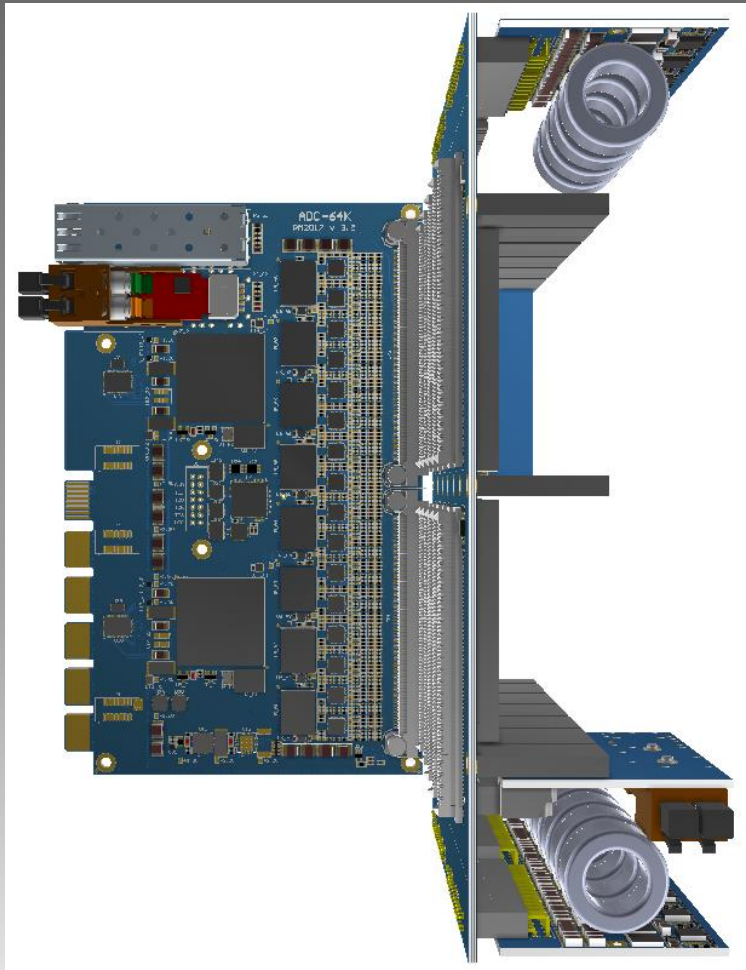


Status:

- Design obtained from the 64-channel ADC for the EMC Forward Endcap
- 90% of necessary work done
- To be submitted for production in the first week of November

- Samtec ECUE (12-channel)
- safe transfer with buffers (400 Mb/s)
- AC transfer up to 1.2 Gb/s up to 3 m
- 144 I/O

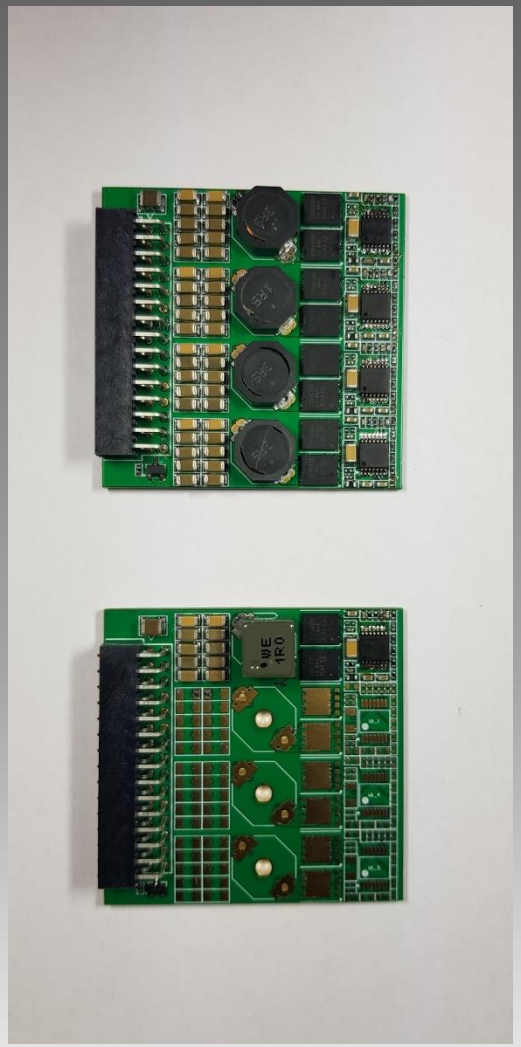
ADC Crate Electronics

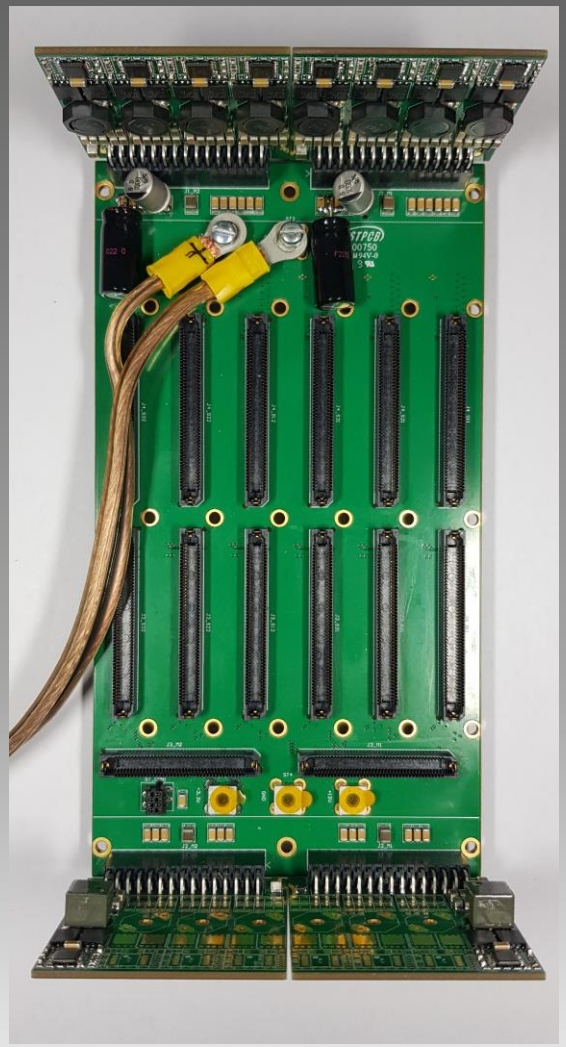


ADC Crate Electronics

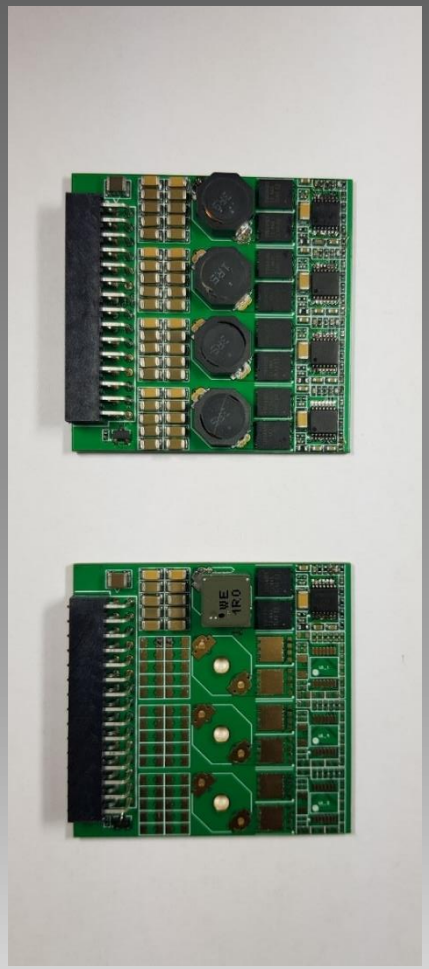
- Rear crate compartment electronics

Backplane and Power





Rear crate compartment electronics



Status:

Power supply

- Good efficiency (90%)
- Coils need manufacturing (winding) and testing
- Irradiation tests pending (applied for at KVI)

Backplane

- Will need some small modifications to comply to the new crate controller

Assembly

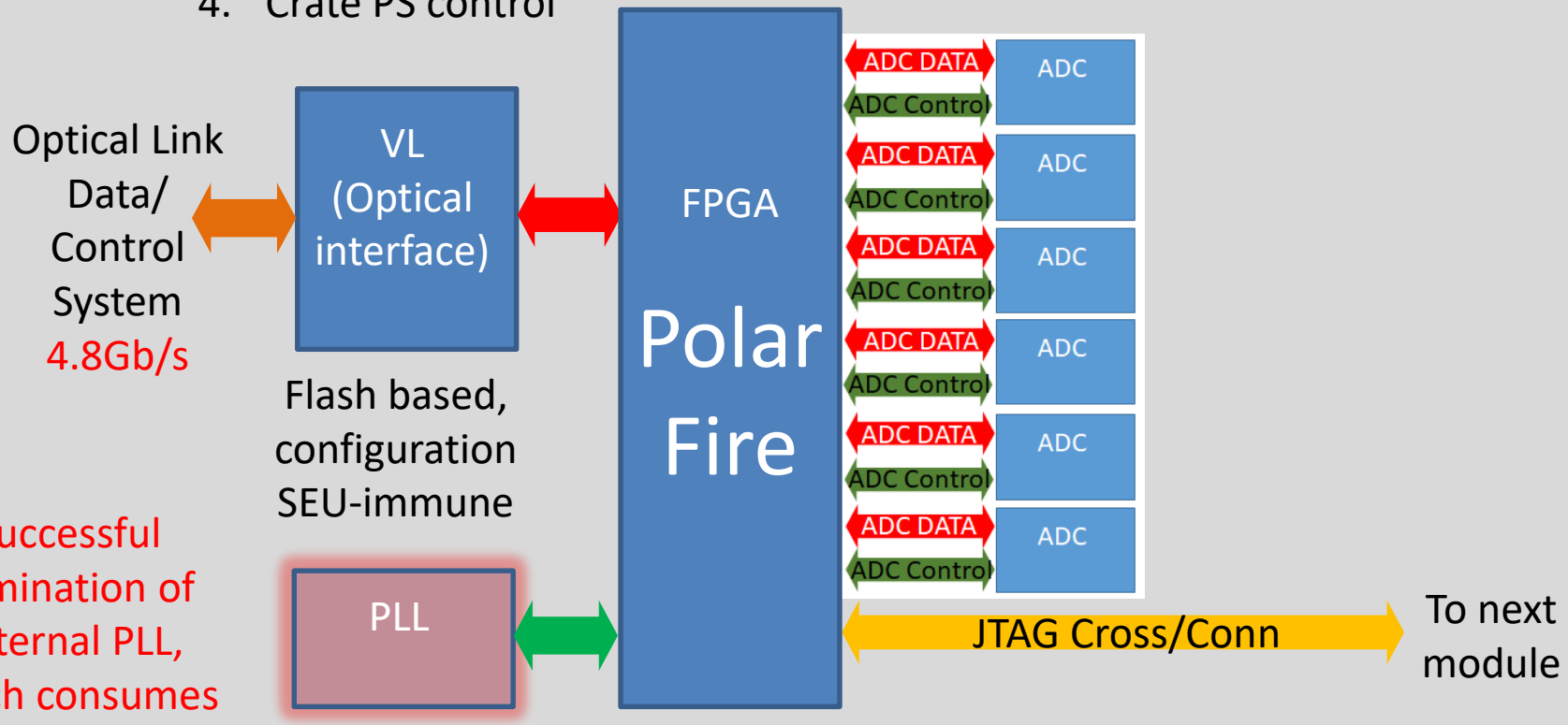
- Cooling tests pending

ADC Crate Electronics

- PolarFire –based Crate Controller

Crate Controller

1. Direct JTAG configuration of individual ADCs
2. Reaction to SEU
3. Health control of ADCs (voltages, currents, temperatures)
4. Crate PS control



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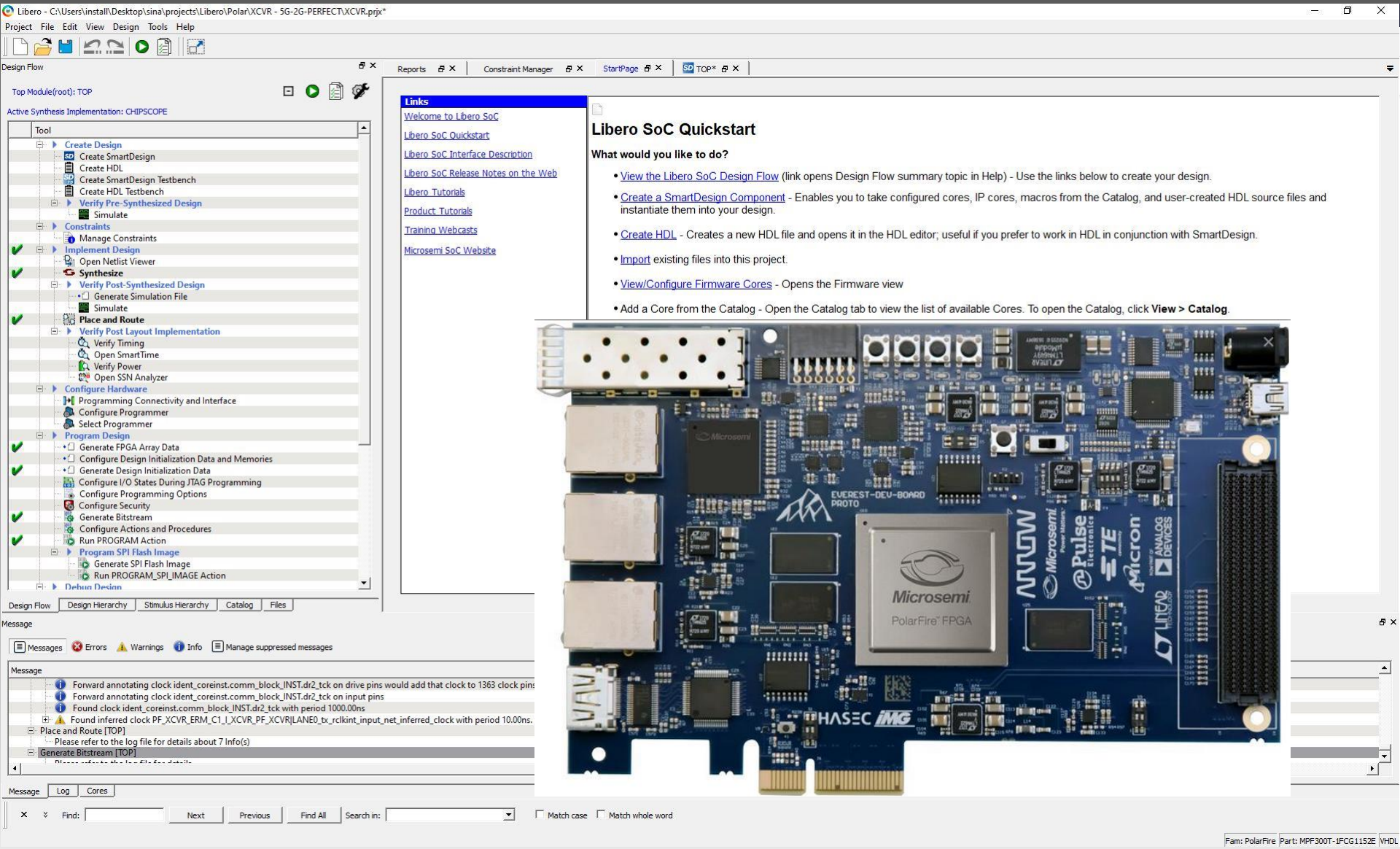
ADC Crate Electronics

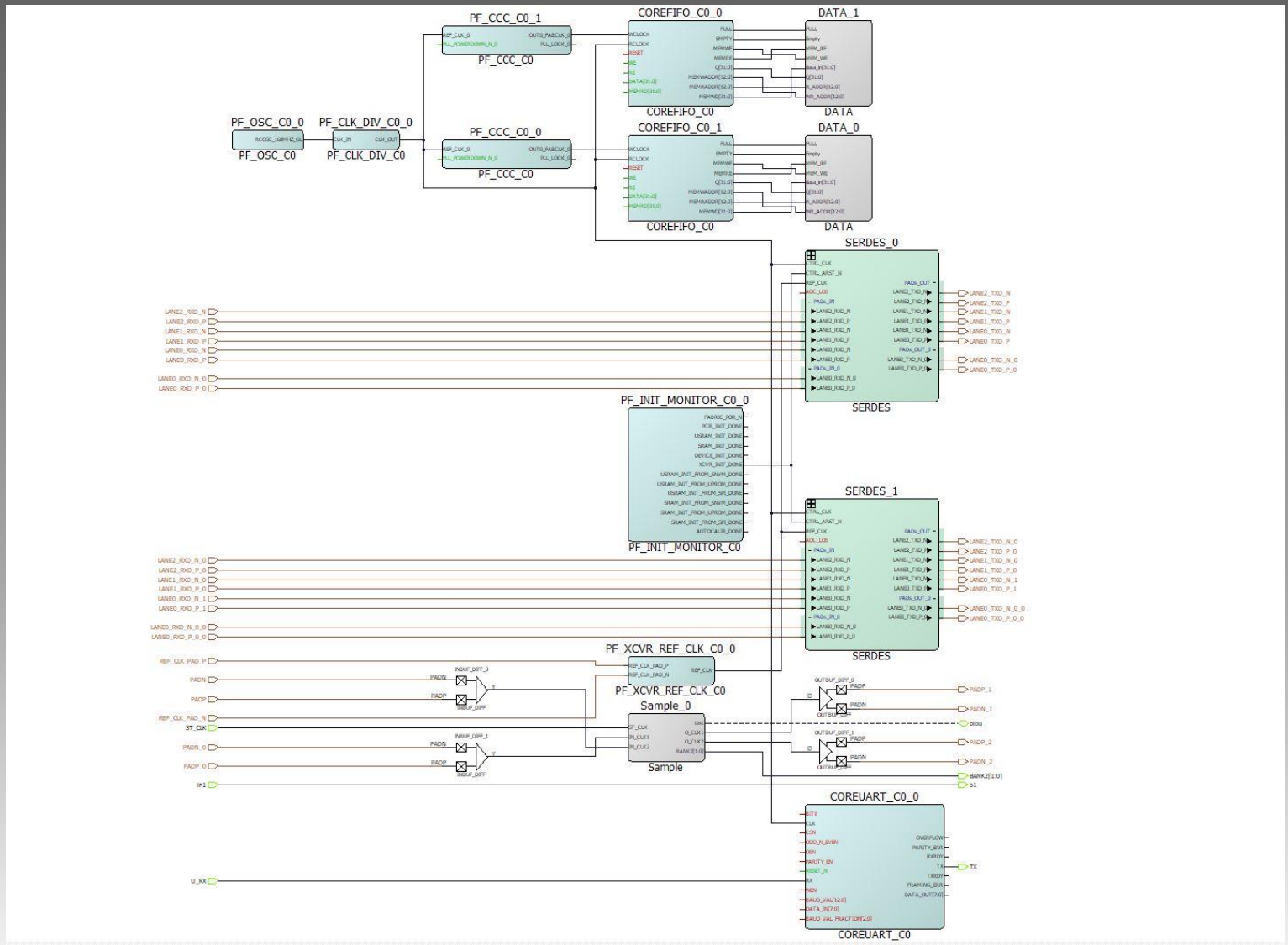
- Evaluation card with Libero development system



ADC Crate Electronics

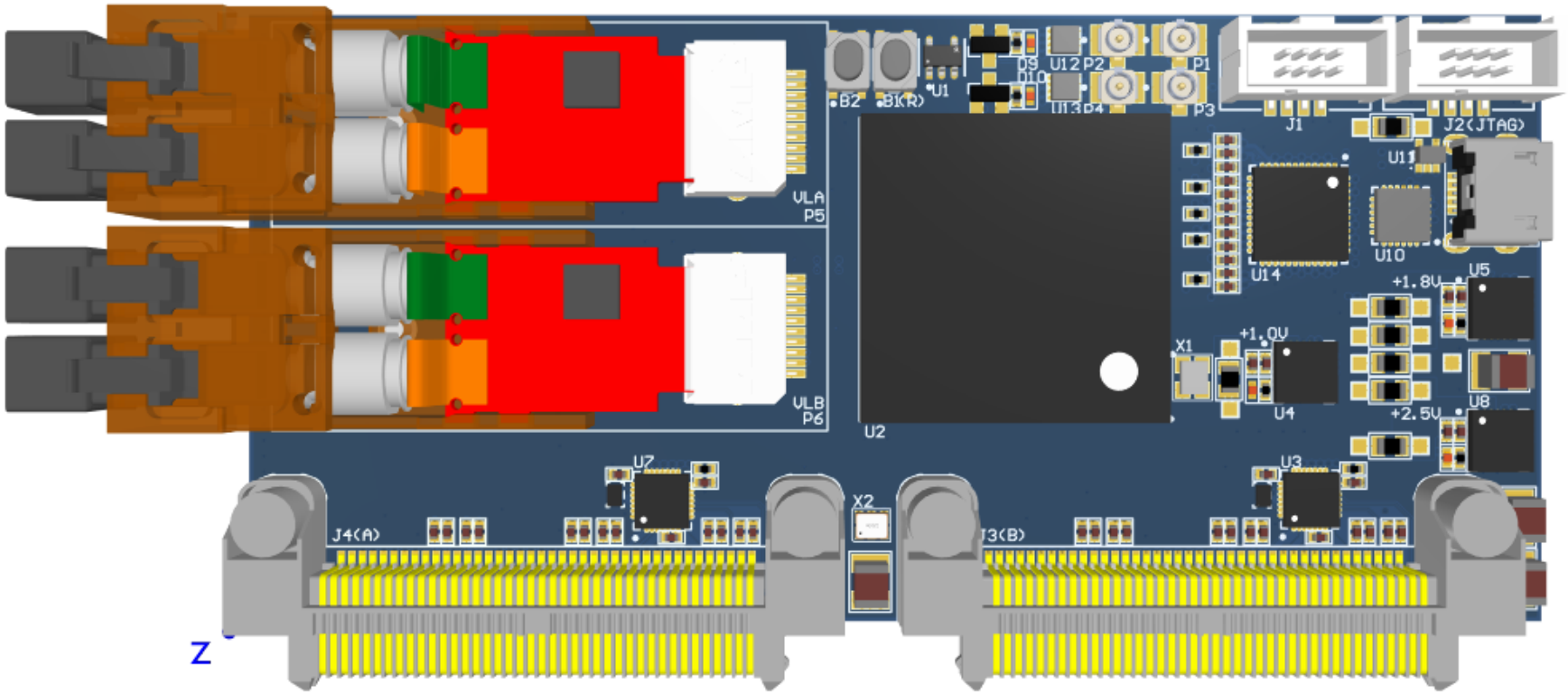
- Evaluation card with Libero development system

A project containing 6 channels 2Gb/s and 2 channels 6.25 Gb/s



Crate Controller

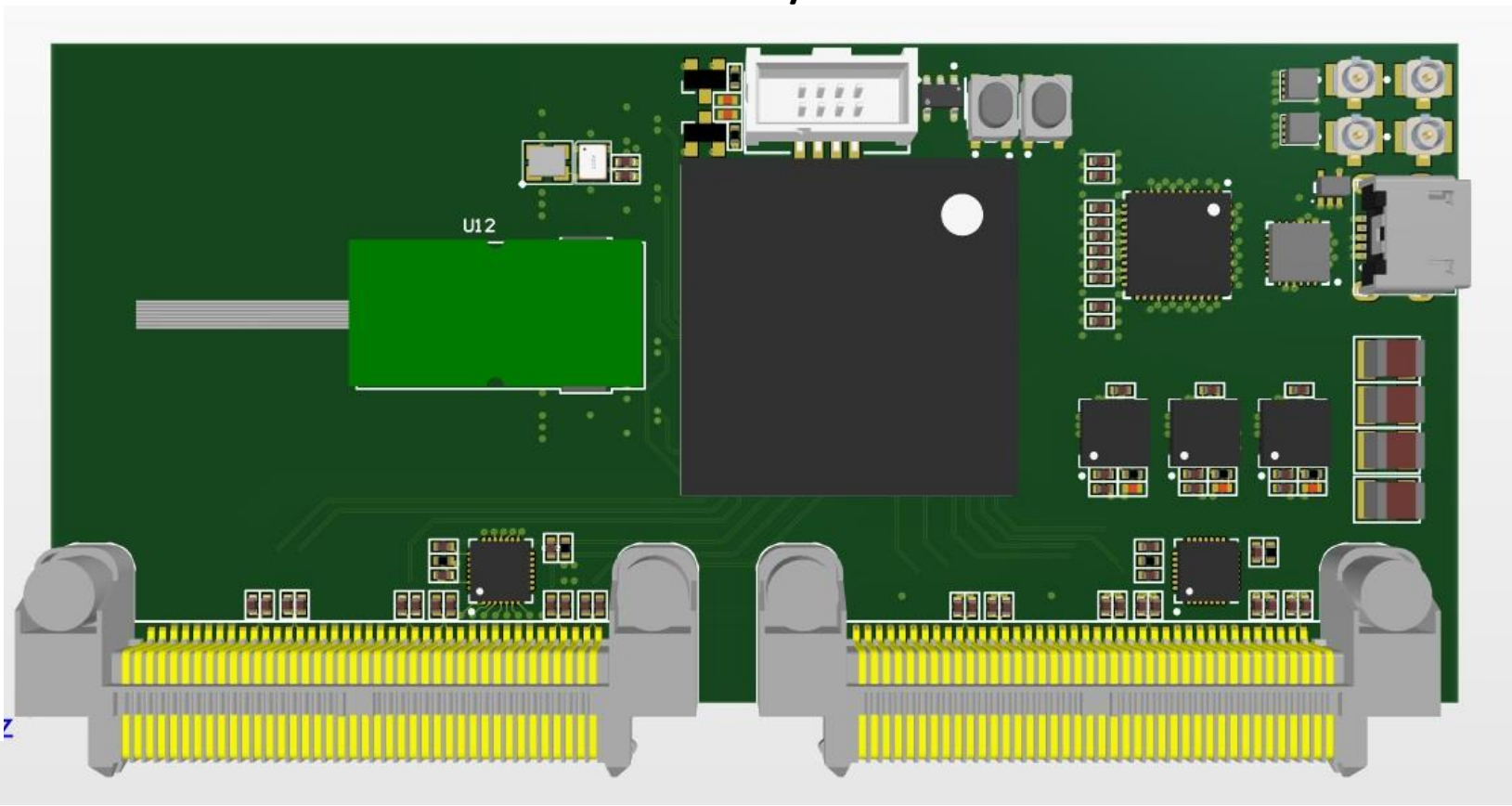
Dual channel VTRx
Test version, 2 x 4,8 Gb/s



VTRx are obsolete

Crate Controller

Future plans:
Dual channel VTRx+
2 x 10 Gb/s



Old artwork of the future Crate Controller
VTRx+ will be produced 2021

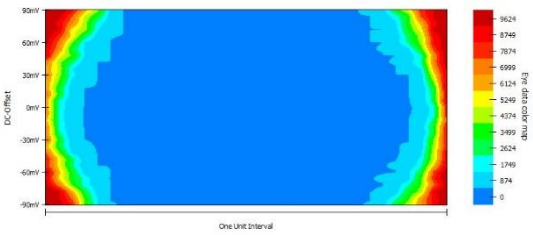
Status

Hardware:

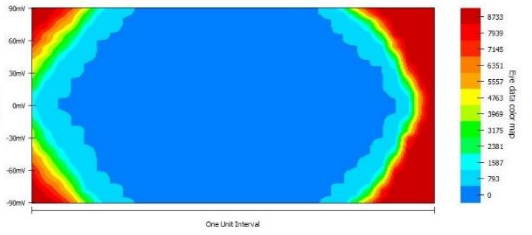
- Hardware design completed
- Recently sent for production

Firmware:

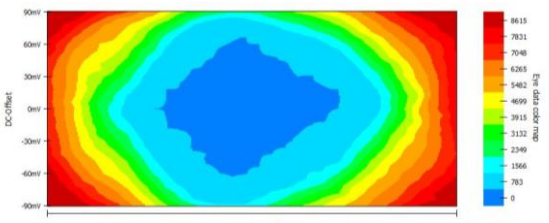
- Canvas project in Libero is ready (mux **3 x 2** Gbit/s → **6.25** Gbit/s
- Successful elimination of external PLL, which consumes ca 700 mW
- Successful time deterministic tests of bilateral communication to ADC
- New master student assigned for development of ADC control firmware



2 Gb/s



6.25 Gb/s



10 Gb/s

Thank You !