

# DHH system

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9-th VXD Belle II workshop

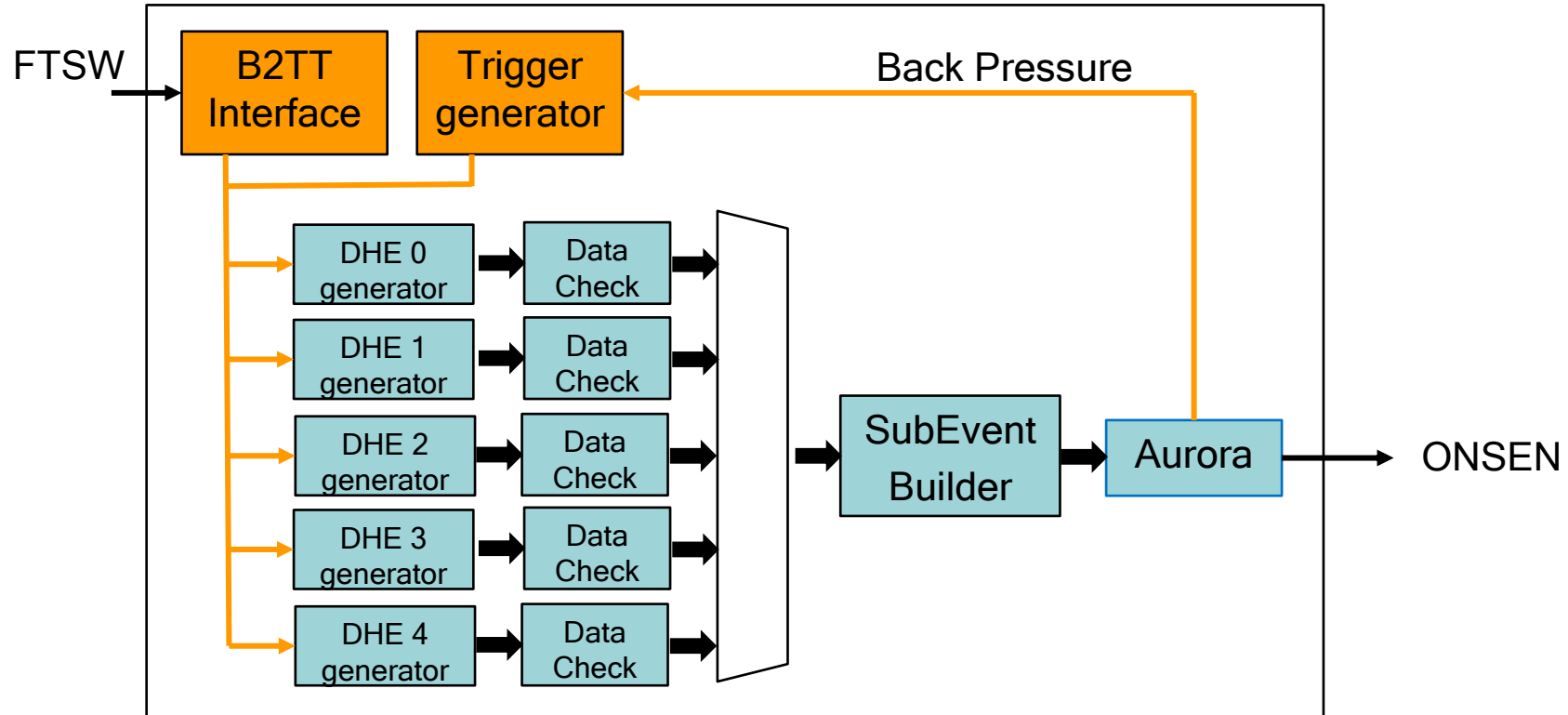
January 13-15 2015

IFIC Valencia

## Overview:

- DHC test with Pocket DAQ
- Test beam readiness
- Optical transmitters
- DHCC - ATCA Carrier Card status

## DHC Firmware :



- tested up to 20kHz @1% occupancy and 10kHz @3% occupancy
- Achieved 600MB/s

## Issues:

- No back pressure from DHC to FTSW instead frames dropped if data rate too high
- Bug in logic of dropping frames

- Hardware for DESY test beam
  - 4 x DHE modules - OK
  - 1 x DHC module - OK
  - Fiber cable to ONSSEN - OK
  - DHCC (carrier card) - being designed
  - DHRTM - being designed , see Yunpeng talk
- DHE Firmware
  - Version from the last test beam at DESY + DDR3 memory - OK
  - No handling of overlapping frames
- DHC firmware
  - Version used for DHC + ONSSEN tests with Pocket DAQ at KEK - OK
  - Fine up to 10kHz @3% occupancy

Setting up a test stand with 5 DHE and 1 DHC @TUM

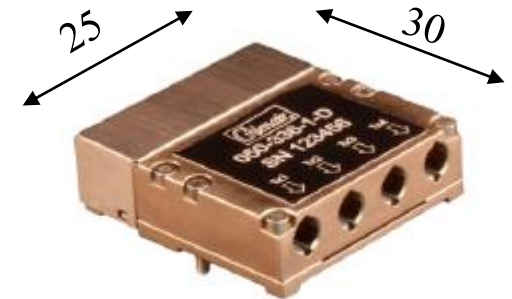
- EMCM or hybrid with 4 DHPT 1.1 chips would be nice to have

Firmware test with existing carrier cards

Test of DHCC and DHRTM in end of February

Start installation at DESY in middle of March(?)

Glenair 050-301-0X irradiated with neutrons and photons  
Sustained 20 years equivalent radiation dose.



050-363-2

We have an offer for the same device in new package

050-363-2 with four transmitters :

21.5 kEuro	45 transmitters , 14 weeks delivery time
18kEuro	28 optical fiber cables of 20m (two per Dock box)

4 Samples ordered and to be delivered in January

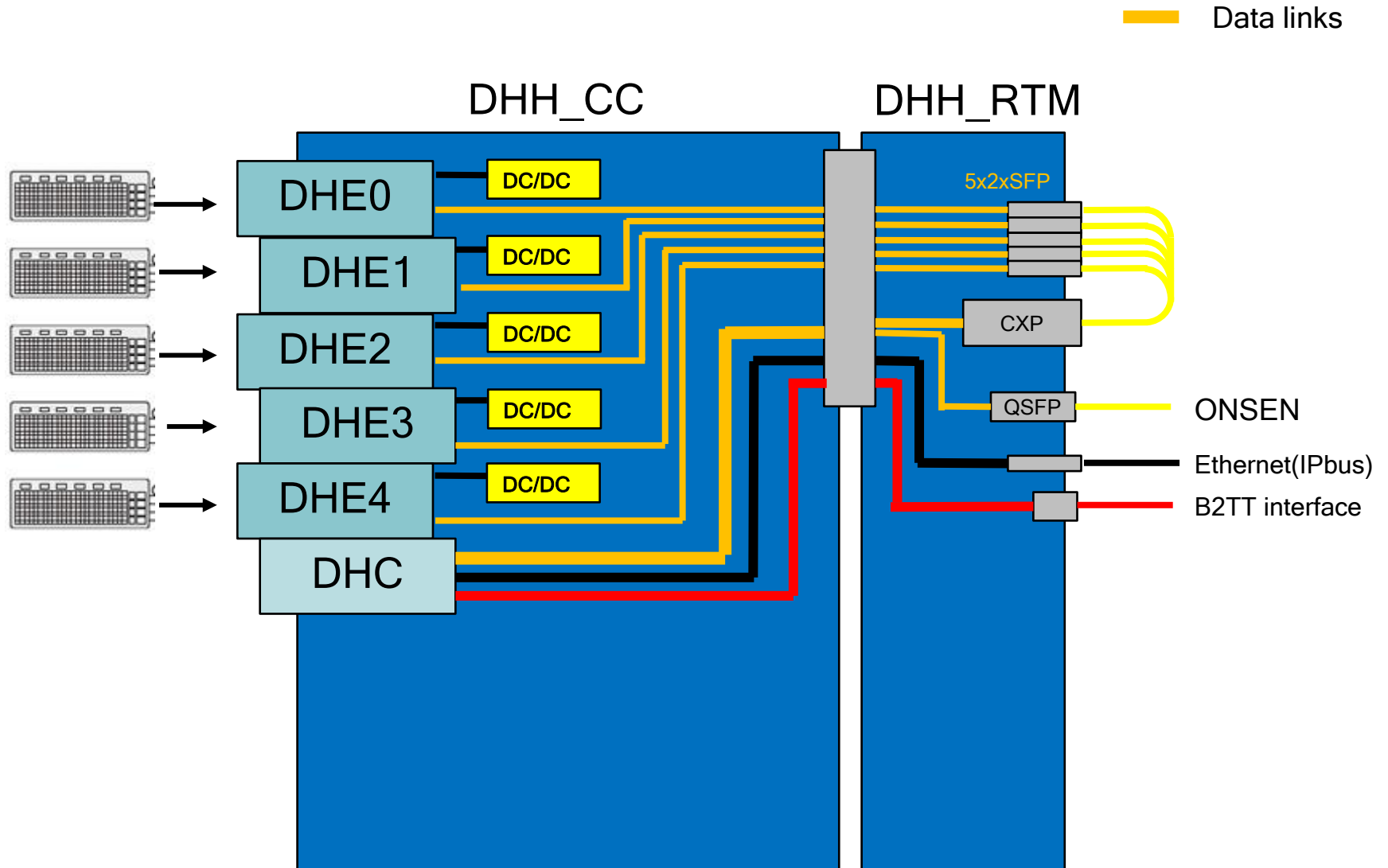
Plans:

- for safety we repeat photon irradiation test after test beam
- Optical link test with detector

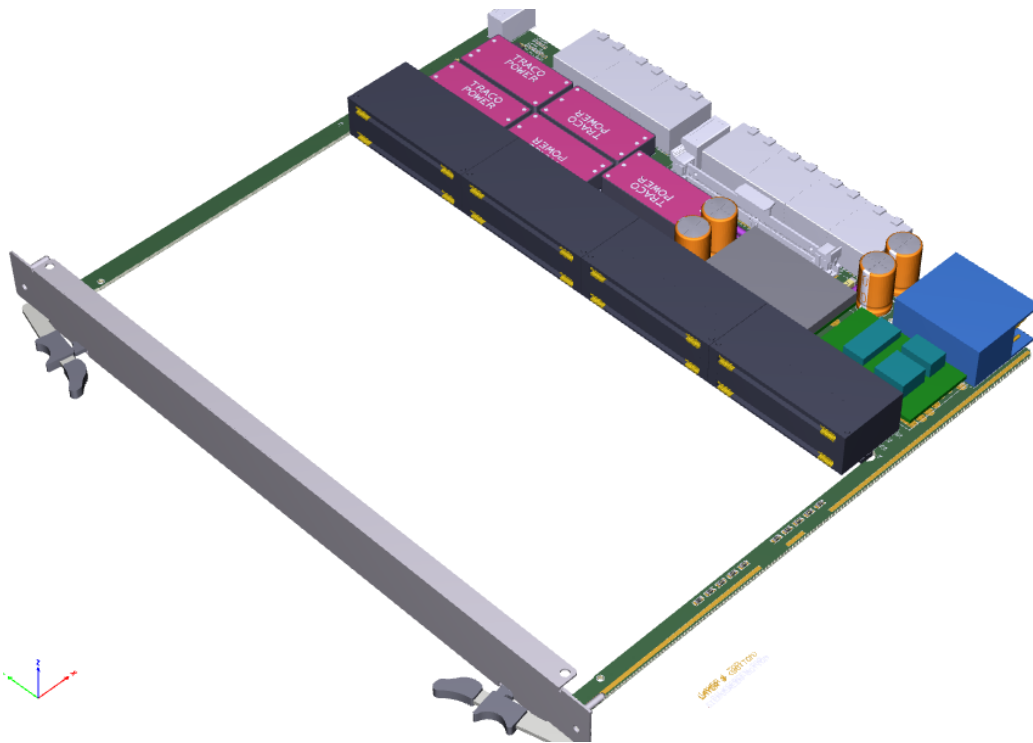
In December the Technical Board postponed the decision about optical link till April to give time to measure DHPT 1.1 serial link performance.

Possible time lines for completion of the project if decision is taken in April:

- April - Order transmitters, delivery in August 2016
- May - complete Carrier Card and RTM layout, start prototype production
- June - test of prototypes
- July - second prototype production
- August – delivery of optical transmitters
- September-November – production of final Carrier Card modules
- December – complete production



# Carrier Card for copper links



- 5 DC/DC converters with galvanic isolation
- 6 electrically independent groups of signals and power
- Optical isolation of high speed signals via RTM
- I2C signal isolation using magnetic isolation IC from AnalogDevice
- IPMI module from CERN

## Status :

- Design rules + Component libraries + Placement - OK
- Layout will take about a week
- Submission for production by end of January



- Priority is preparation for test beam
- DHE firmware ready
- DHC firmware works up to 10kHz and 3%occupancy, to be tested in the lab with real DHEs and EMCM(?)
- DHCC and DHRTM for copper links modules being designed, production and test in February
- Optical links will be prepared for tests with detector but with low priority
- Decision about Optical vs Copper solution ?

THANK YOU