

Some updates on the electronics for the data link

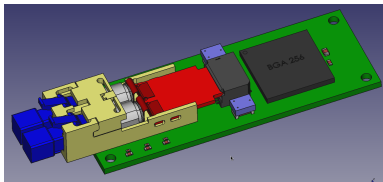
Daniela Calvo Paolo De Remigis Cecilia Giovinazzo
Marco Mignone Richard Wheadon



November 30, 2015



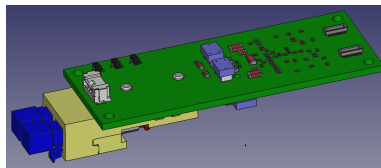
The board design for the GBT link



Board top view

The first design aiming to the final dimension.

GBTX ASIC and VTRX transceiver on the same side.

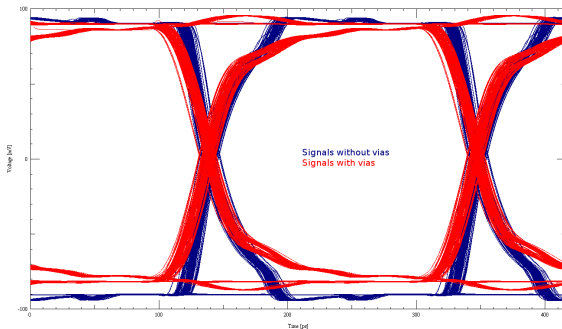


Board bottom view

Passive parts distributed on both sides.

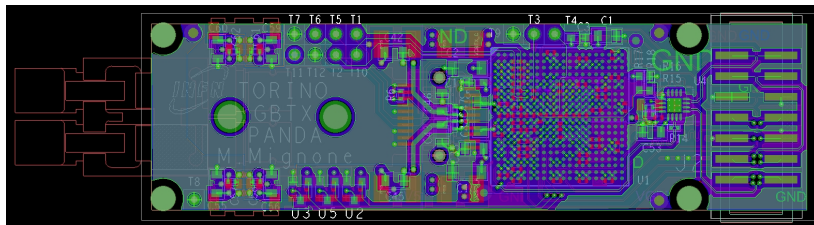
Aluminium cable connectors on the bottom side.

The change in the new board design



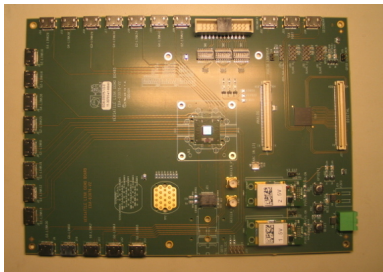
- Due to cooling constraints the GBTX has been moved on the bottom side.
- Vias have been added on the high speed tracks, with moderate effects at first glance.

The submitted board design



- The board submitted for production is once more different due to the connectors for the E-link.
- The board delivery is expected for the next January, waiting for the parts compatible with the magnetic field.

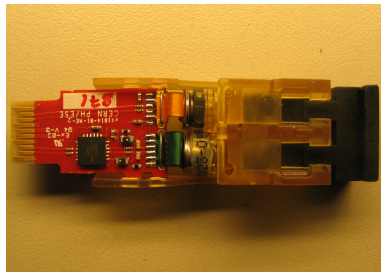
The Versatile Link Demo Board



Versatile Link Demo Board

The first Versatile Link Demo Board (VLDB) is just received.

The VLDB will be used as data source for the GBT-FPGA.

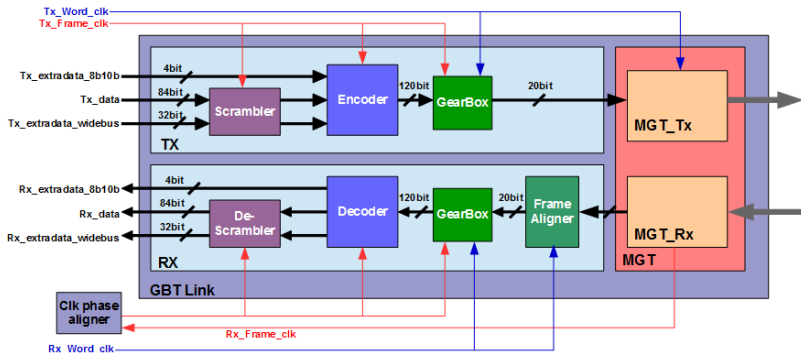


Versatile Transceiver

The Versatile Transceiver (VTRX) is used on the VLDB.

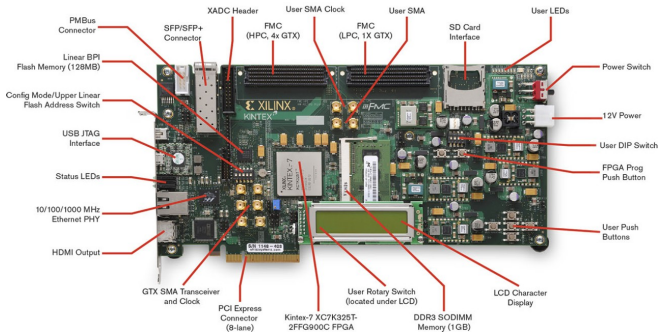
The 4.8 Gbit/s VTRX will be also used on the custom board.

The GBT-FPGA firmware



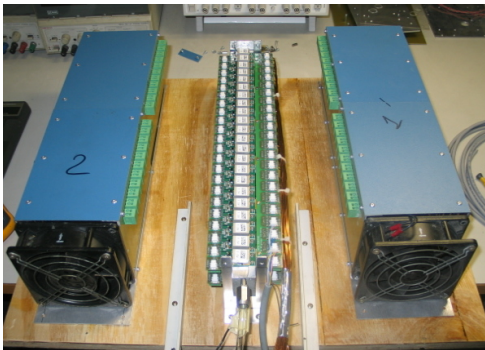
- The GBT-FPGA firmware has been configured to be implemented on a ml605 evaluation board with a Virtex6.
- Due to the bottleneck of the ml605 and of the current Avago transceiver the line data rate has been reduced to 2.4 Gbit/s.

The new board for developing



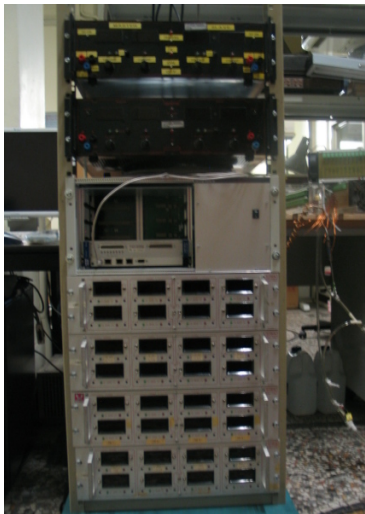
- To allow a test at full speed a new kc705 evaluation kit, based on Xilinx Kintex7 has been bought.
- A new transceiver running at 10 Gbit/s, from Finisar, is available to test the GBT-FPGA firmware on the Kintex.

The test bench for the power rod



- A test for the DCDC power rod assembled with 88 channel is in progress, with load heat dissipation based on fans.
- To completion of the system, since the DCDC power rod is water cooled, a chiller and a pump are needed.

The supply rack for power rod



- To provide the required current, a 19 inch rack has been almost filled with power supplies.
- The present solution with 24 power rods around the beam pipe should be carefully evaluated.

Summary and outlook

Conclusion

- A board design for the GBT ASIC and VTRX transceiver was completed providing a solutions to facilitate the cooling.
- The fist prototype is expected for January with the aim to connect it to a Topix board.
- A GBT-FPGA implementation at 2.4 Gbit/s was completed; the next step will be the migration to Kintex7 at 4.8 Gbit/s.
- A test bench for the power rod with 88 channel is in progress, with the full current load and the water cooling system.
- At INFN no manpower was allocated to \bar{P} ANDA for 2016; each task could be only accomplished on a voluntary basis.