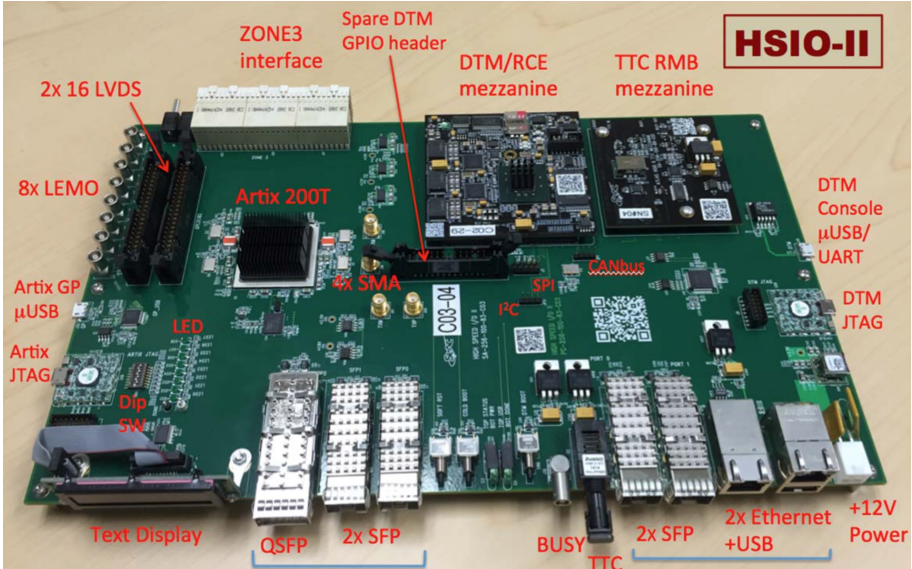


HSIO II

Martin Kocian

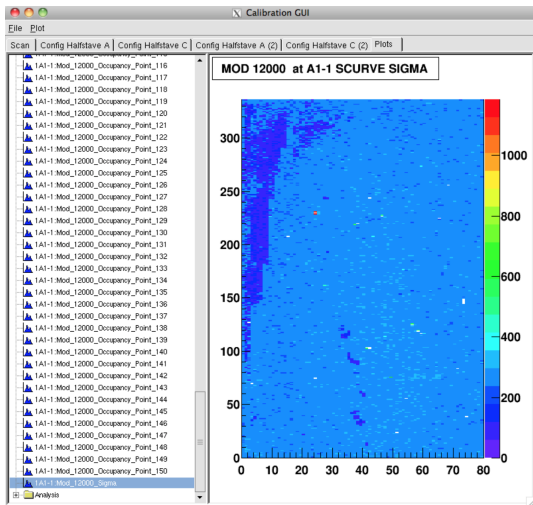
27 January 2017

HSIO II Board



- Artix 7 FPGA (XC7A200TFFG1156).
- RCE plugs directly into the HSIO 2 board (no more ATCA crate needed).
- RCE is based on a Zynq FPGA (dual core ARM processor running Arch Linux. Two Gigabit ethernet interfaces via RJ45).
- Various other I/O ports (LEMO, headers, dip switches, LEDs).
- ATLAS TTC interface.
- Adapter connector for 84 LVDS pairs and 4 MGTs.
- 13 MGTs (GTP) connected on the board.
- **45 boards have been produced and distributed (mostly ITK pixel).**

- Custom software is used for scanning/data taking.
- Runs on Linux PC and RCE's Zynq.
- **calibGui** for scanning and tuning.
- **cosmicGui** for standalone testbeam operation.
- **rceOfflineProducer** for Eudet operation.
- All scans that were used during IBL stave QA are available for the new HSIO.
- Currently supported FE types are FEI4B, FEI4A, FEI3 pixel modules, DBM hitbus chip, AFP HP-TDC.



- The current frontends connect to low speed GPIO pins on the HSIO.
- Various interface boards can be plugged into the zone 3 interface connector.
- For RD53 the data link has to connect directly to 1 or 4 MGT lines.
- Several options exists:
 - 1 QSFP.
 - 2 SFPs.
 - 4 high speed lines through the zone 3 ATCA connector.
- If we use the zone 3 connector a new adapter board has to be designed. In that case we are free to put any frontend connector we like on this adapter board.



- The HSIO II is a wide-spread test platform in ITK.
- It currently implements low-speed links for FEI4/MCC(FEI3).
- The GBT chipset is also supported (20 FEI4, 1 GBT via SFP).
- We plan to use the HSIO II for RD53 testing.
- Common testing software is under development.
- 10 MGT channel outputs available.
- 4 are on the zone 3 connector and could be used on a new adapter board.
- For larger number of chips the ATCA based RCE system could be used.
- One ATCA board (COB) has 96 MGTs.
- Current RTM (back of crate) boards exist with 16 SFPs, and a specialized RTM for CSC with Snap 12 plugins.
- Documentation for users on how to set up the system is available on the web: <http://cern.ch/rceproject>