MiniDAQ2 clock tree and clock distribution

MiniDAQ workshop

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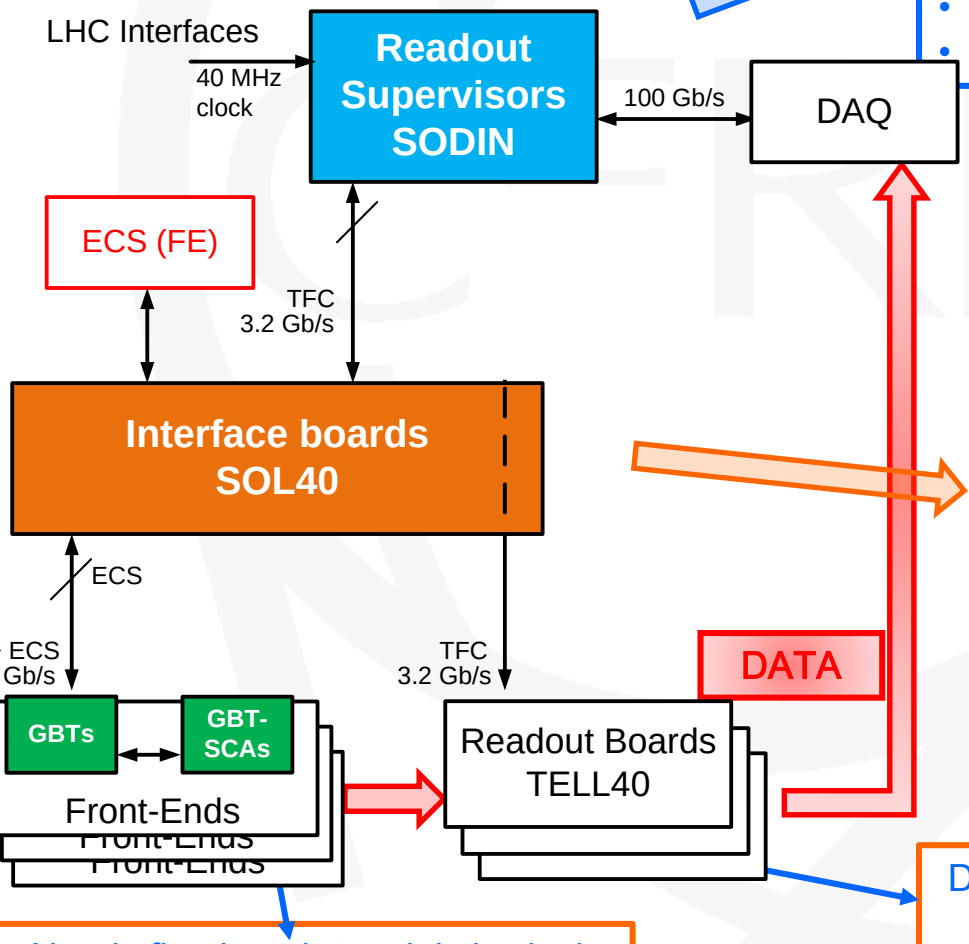
The upgraded TFC system at a glance



SODIN responsible for controlling upgraded readout system

- Distributing timing and synchronous commands
- Manages the dispatching of events to the EFF
- Rate regulates the system

SOL40 responsible for interfacing FE and TELL40

- Fan-out TFC information to TELL40
- ~~Fan-in THROTTLE information from TELL40~~
  - do not distribute throttle back, but local throtting in TELL40
- Distribute TFC information to FE
  + clock and timing
- Distribute ECS configuration data to FE
- Receive ECS monitoring data from FE

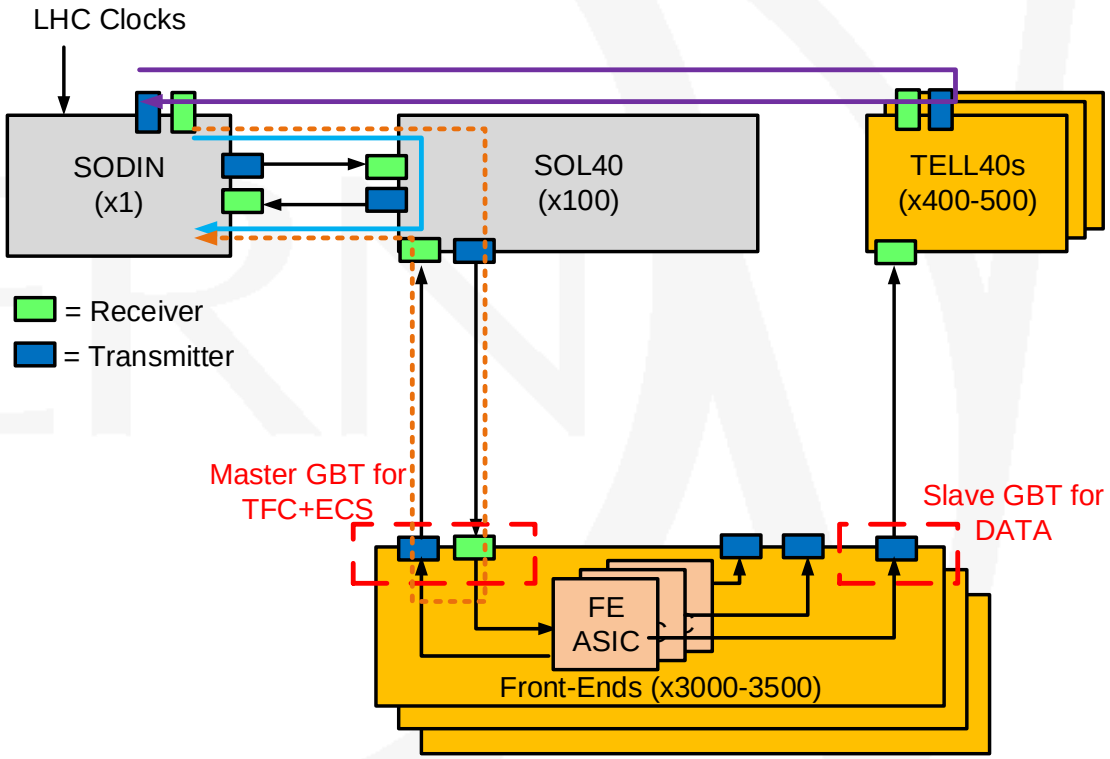
Does not need fixed and deterministic clock nor latency + readout control

Needs fixed an deterministic clock phase and fixed latency + configuration + monitoring + readout control

Timing and command distribution

Master GBT @ FE controls the FE ASIC + Slave GBTs

- Clock from Master GBT
- TFC commands on e-links
- ECS configuration and monitoring through SCA
- Slave GBTs controlled through SCA from Master GBT



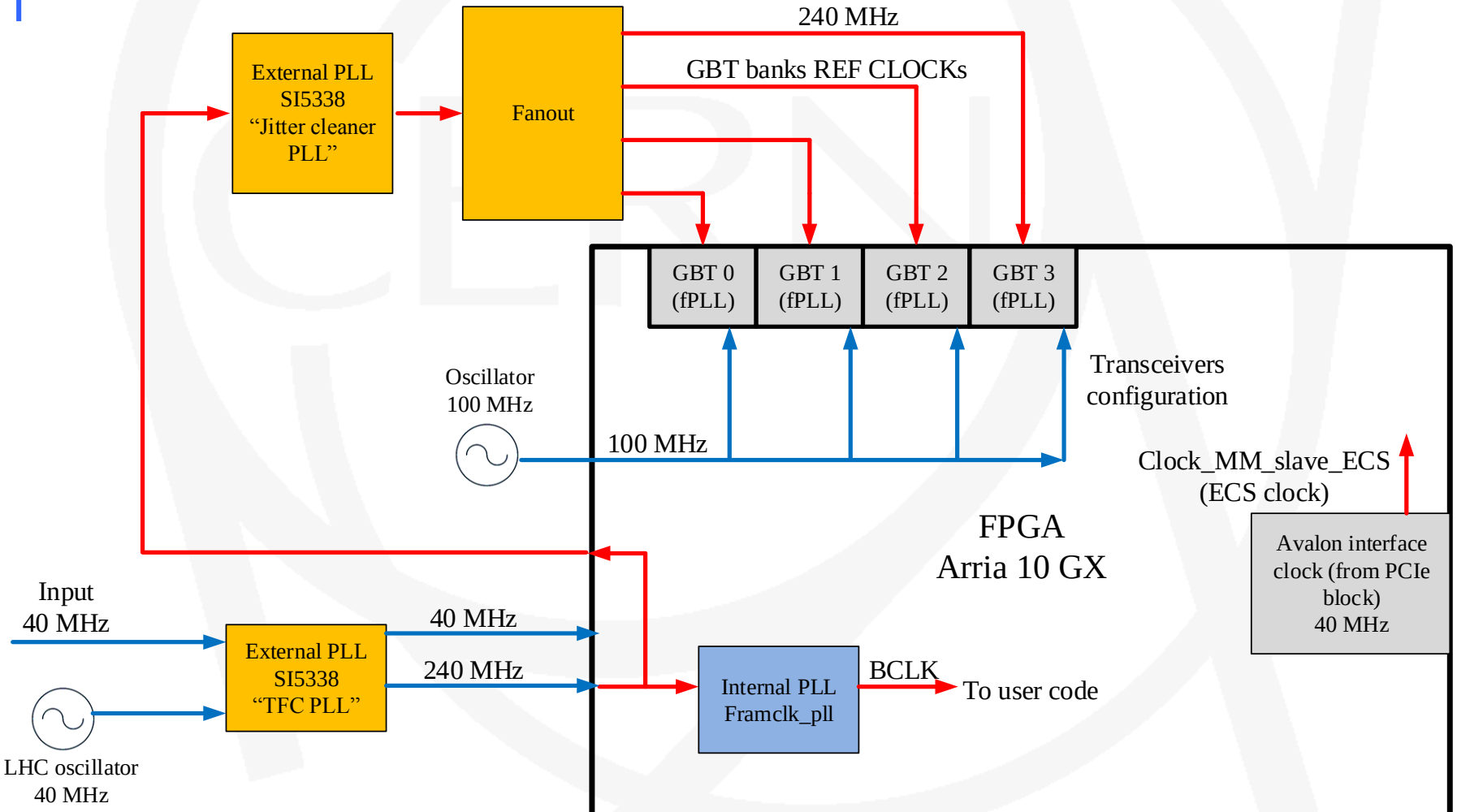
Fixed latency and deterministic phase recovery of TFC commands is ensured by combination of FPGA and GBT features

→ Customization is needed to synchronize links and make sure that TELL40s decodes data properly

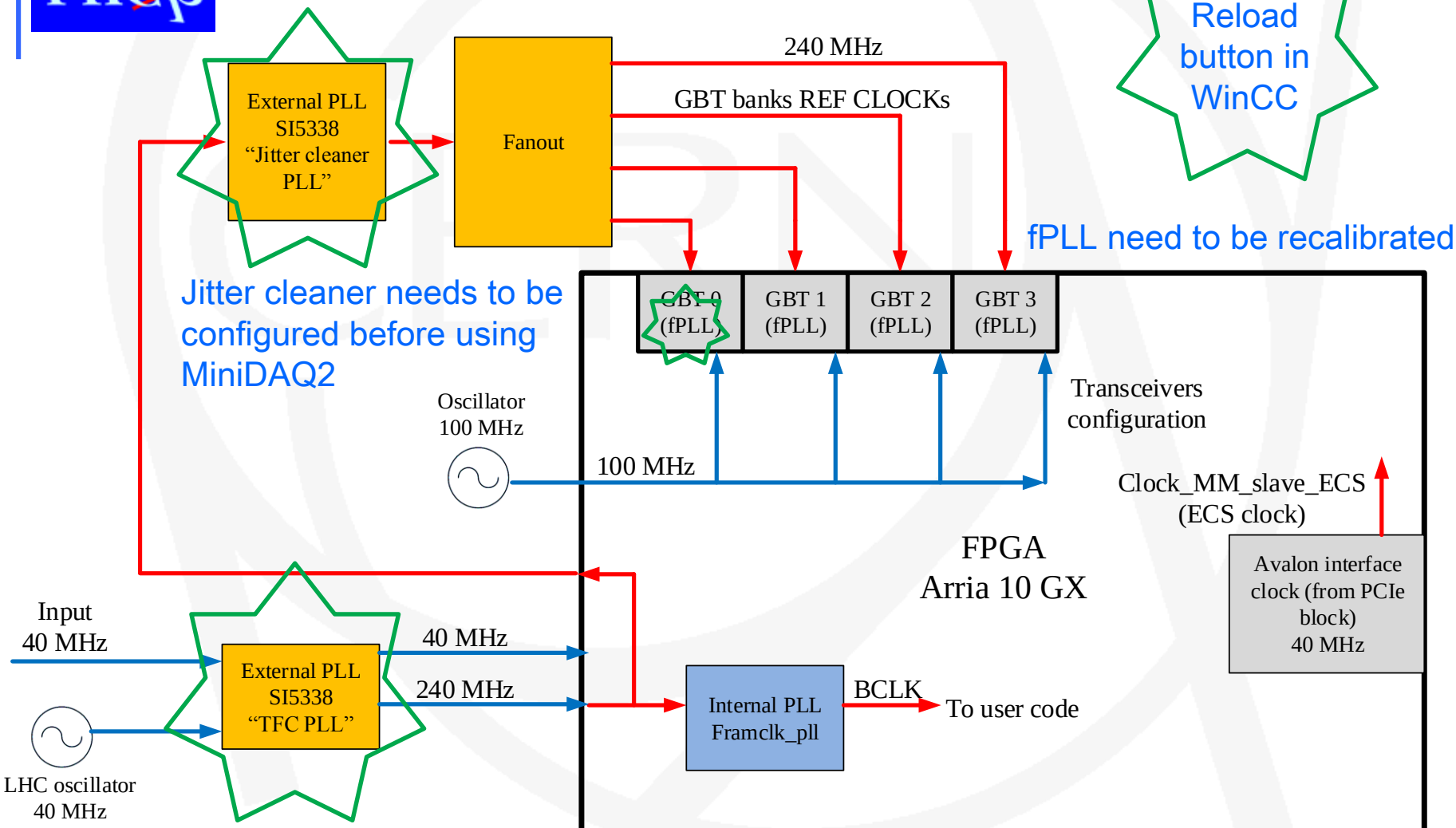
→ Customization is needed to properly decode TFC commands

→ ECS to FE through TFC links via SOL40 (Joao)

Clock tree on MiniDAQ2

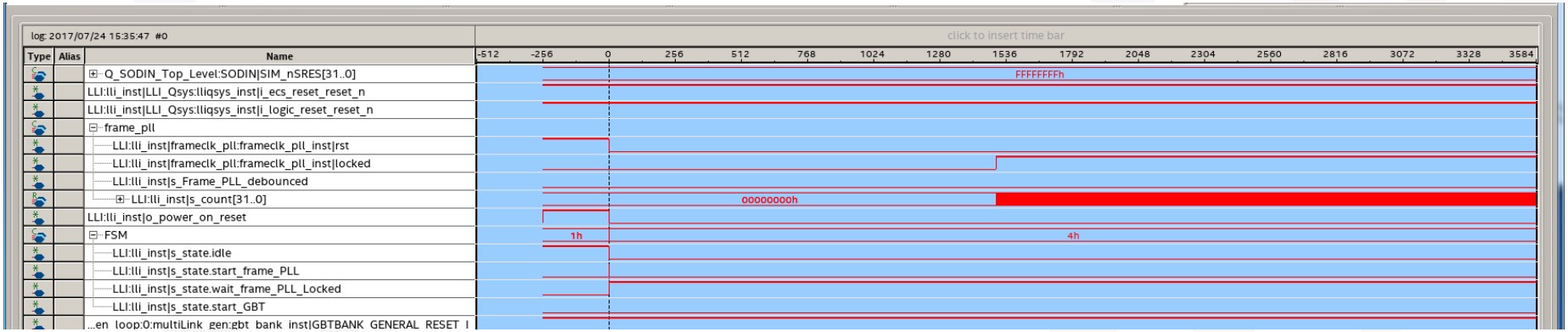


Clock tree on MiniDAQ2



Power-on procedure

Power-on procedure to make sure that clocks are well generated (Fred Hachon)



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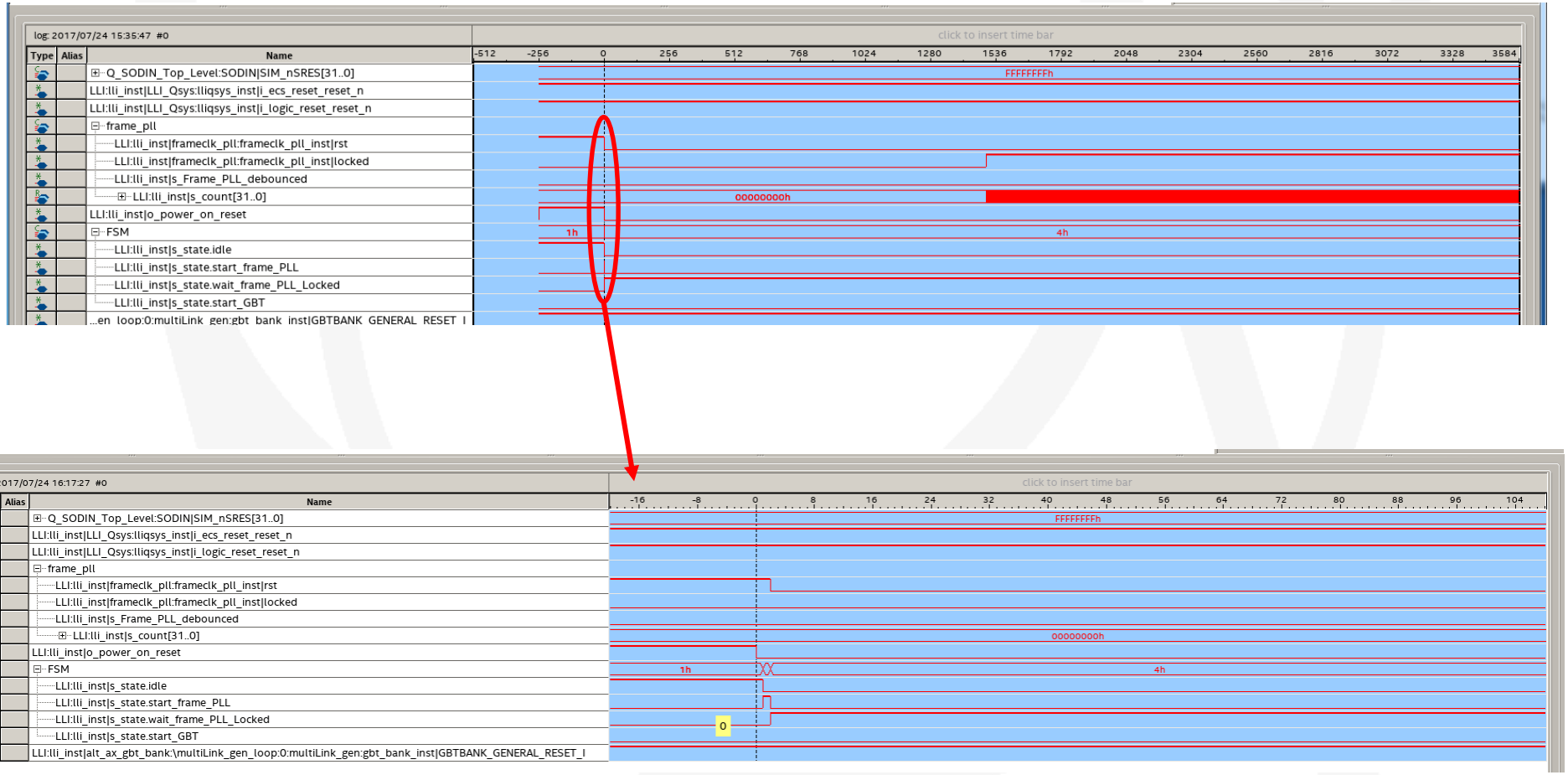
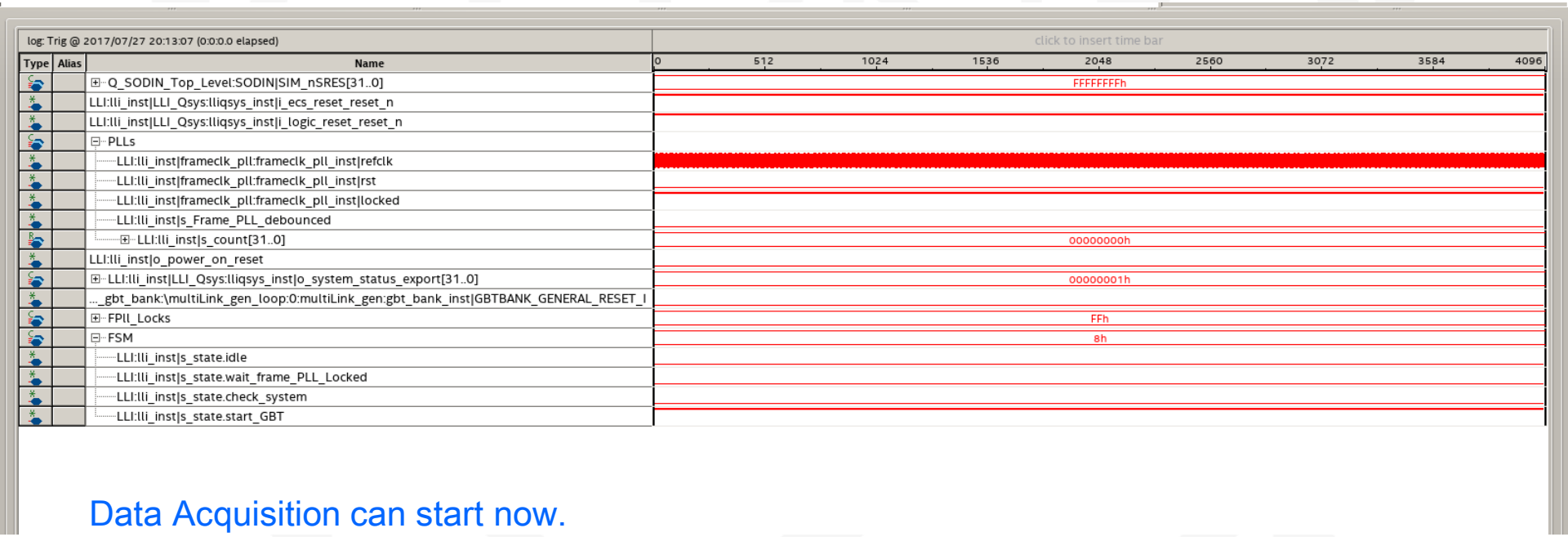


At this point the firmware waits for the fPLL to be recalibrated

Power-on procedure

Whe done a register is set to 0x1 and the internal state machine starts, release the reset to the GBT banks



Data Acquisition can start now.

Power-on procedure

If a «logic reset» is issued to the LLI, the procedure restarts

Then, the user need to hit the button reload again

Data Acquisition can start again after this procedure.

Clock tree in a GBT bank

Inside a GBT bank, the clock tree looks like this