Development of a trigger card on FC7

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Supported by OTKA K124850
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μTCA test setup

- 8SFP FMC
- PSU
- AMC13
- TTC input
- TTC output
- MCH
- IT/OT FC7
- TTC FC7
- DIO5 FMC
μTCA test setup description

→ FC7 with TTC-μDTC-firmware
   → DIO5 FMC card receives external clock from outside
   → internal clock and trigger generator available
   → 8SFP FMC card sends clock and trigger to AMC13

→ AMC13
   → clock distribution card for CMS
   → AMC13 receives TTC signal from FC7 with TTC-μDTC-firmware
   → distributes clock + TTC channels on backplane to FC7 with IT/OT-μDTC-firmware
   → where TTC channel A carries the trigger, channel B carries various commands, e.g. reset for counters

→ FC7 with IT/OT-μDTC-firmware
   → TTC decoder implementation same as in Phase 1 firmware, present in both IT/OT
   → receives clock + trigger on backplane from AMC13
State of development

Done so far:

- FC7 clock source switched to FCLKA distributed by AMC13
- TLU / DIO5 ported to IT-μDTC-firmware → μTCA crate can receive external clock
- TTC decoder ported to IT-μDTC-firmware → FC7 can accept triggers from AMC13
- Hardware tested and debugged carefully
- IT/OT receives clock + trigger from AMC13

Working on:

- 8SFP FMC i2c programming in progress
- sending clock + trigger from TTC-μDTC-firmware to AMC13
- TTC-μDTC-firmware validation, implementation of event counter, sending counter resets
- timestamp and measure the phase of each incoming trigger
L1A triggers detected in FC7