

DHH in the ATCA shelf

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Uhrenturn der TVM



DHH in the ATCA module





DHH in the ATCA module / RTM



DHC Features

- Hardware Link to EPICS, ONSEN and FTSW
- Jitter cleaned clock via SiLabs-chip, has to be programmed after power cycle
 → Used as reference clock on all DHEs
- Interface to all connected DHEs via UCF protocol (Up to 5 DHEs)
 - Distribute Trigger and Clock
 - \rightarrow Phase synchronous to all DHEs
 - IPBus hub for all connected DHEs
 - \rightarrow Multiplex Ethernet packages
 - Buffer Data from DHEs

ПΠ

DHE Features

- Operates on the recovered UCF clock
- Phase synchronous to the B2TT clock
- Controlled via IPBus 2
- DHP data-interface as used in PERSY
- Limited trigger rate
- No overlapping triggers
 ⇒ Not surprisingly limit of 12 kHz trigger rate

ТШ

Installation at KEK

- One ATCA shelf
- Two ATCA carriers
- Each houses one DHC and two DHEs
- Control connection to the DHPT via DHI prototype
- Data interface via optical fibers
- Accessible via shroud computer

ПΠ

Status KEK

Status

- All modules accessible by IPBus
- UCF link stable over long periods
- Possible to take data at 12kHz over long time period

Issues at KEK

Issues

- IPBus looses packages
- Trigger number in DHE/DHC mismatch requires manual reset \rightarrow Simon implemented IOC
- After powering up: Reprogram DHC to get stable UCF clock
- Memory dump data: Sometimes one additional word
- Not full trigger number transferred to DHE

ТШ

Issues at KEK

DHC has to be reprogrammed after switching on power

• Explanation:

High speed transceivers need toggling reference clock during startup

- Resolution: Boot with oscillator clock Program SiLab chip Switch reference clock
 - IPBus looses packages
 - Trigger number in DHE/DHC mismatch requires manual reset \rightarrow Simon implemented IOC
 - After powering up: Reprogram DHC to get stable UCF clock
 - Memory dump data: Sometimes one additional word
 - Not full trigger number transferred to DHE

ТЛП

Issues at KEK

IPBus looses packages

- Explanation: Multiplexer logic on DHC
- Resolution: Rewrite that logic

ТШТ

Issues at KEK

Trigger number in DHE/DHC mismatch requires manual reset

- Explanation: Runreset not propagated to all necessary places
- Resolution: Propagate reset to DHE Keep reset high for ~1us at DHC (distance to first trigger should be at least 1us)

Memory dump data: Sometimes one additional word

Not full trigger number transferred to DHE

ТШП

Issues at KEK

Memory dump data: Sometimes one additional word

- Explanation: Not understood yet
- Resolution:
 ???

Memory dump data: Sometimes one additional word

- Not full trigger number transferred to DHE

ТЛП

Issues at KEK

Not full trigger number transferred to DHE

- Explanation: Only 16 bit transferred from DHC to DHE
- Resolution: Transfer 32 bit

ТШП

Recent firmware improvements

- Startup with oscillator instead of B2TT clock
- UCF stability improvements
- Full 32 bit trigger information to DHE
- Reset DHC for 1us after runreset signal
- \Rightarrow Tested last week, not able to get good data

ТЛП

Last missing item: Support of overlapping triggers



Firmware developed, tested during the next weeks

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ТШ

Conclusion

- Phase2 DHH system is installed at KEK
- Possible to take data at trigger rates <= 12kHz
- Some issues identified, no showstoppers
- High rate firmware to be tested