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XFEL 2D Pixel Clock and Control System

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Overview

Bunch Veto 100 MHz Clock Processor C+C Start/Info/Stop Crate FEE C+C Master Fanout **Bunch Veto** Slave **FEE** Status 4 1-20MHz? Clock 5MHz Clock μ TCA Crate Telegram Trigger + Trig/Data **MINIMUM FANOUT REQUIREMENTS :** Other XFEL Timing Timing 16 + Fanouts, expandable 3x Outputs (diff. LVDS, STP/UTP) Interface Receiver 1x Input (single line, level only)

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Issues from last meeting

• 5 MHz TR clock stability / glitches

(we understand from Peter G. that this issue has now been sorted out....)

- 5 MHz clock from TR (not 100 MHz)
- Fast Bunch Veto ("Bunch Reject") timing to be selectable as to allow use for the "last-but-one" bunch (400nsec) or for the "last one" (200nsec)

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Conceptual Design -1-

- Master and Slave will be proper AMC / uTCA cards =>
 - i.e.. boards will be fairly 'smart' :
 - Micro-controller
 - Small FPGA (?)
 - => so no need for custom backplane, as all boards will have communication built-in
 - => Individual Fanout-to-Master status feedback links via backplane TCP/IP
- Separate uTCA Slave is a bit of a waste of all this => maybe something more modular
 - Generic baseboard with plugging
 - Master = 1x fanout + 1x TR / beam interfaces plug-in
 - Slave = 2x fanout



a) Vertical Plugging (double stack conn.)



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b) Layered plugging (single stack conn.)



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More Thoughts...

- Multiple plug-ins nice as all fanouts are equal (delays etc.)
- BUT a C&C baseboard with 8x fanout integrated has other advantages:
 - -Basic unit of the C&C system is one board
 - -Cheaper
- Could make the same PCB but load only the parts required ... –Larger FPGA (with more logic / IO) on Master (?)

c) Single integrated card



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Modular Jacks 2x4 OFFSET STACKED W/GROUND CLIP



EDMS Nr.: D0000001450381 Rev: A Ver: 1 Status: Released Dat.: 06.07.2009

Tyco Electronics Stacked RJ45 Modular Jacks for AdvancedTCA

- Tyco Electronics has released new stacked RJ45 modular jacks designed to meet both AdvancedTCA and AMC standards.
- The offset has been designed to fit the faceplate and board layout in AdvancedTCA and full size AMC modules, while providing the port density of the stacked configuration
- These jacks are shielded and include panel ground springs for EMI containment.
- Offset designed to meet both ATCA and AMC standards
- Category 5 performance
- Press-fit termination to the board
- Available in 2x1, 2x4, 2x6, and 2x8 configurations
- Available with various LED options
- <u>SAMPLES ARE NOW AVAILABLE !!!</u>

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- Isolation between C&C and Front-end
 - should all signals be isolated at receivers ?
- Proposal: ANALOG DEVICES Standard Digital Isolators :
 - available up to 100 MHZ (at 3V3) or 150 MHz (at 5V)
 maximum rate, 1-channel, 8-pin SOIC
 - ADUM1100BR
 - ADUM3100BRZ (increased ESD/latch-up protection)



End.....

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