



# Alpha Firmware Tests

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Trigger Hardware Meeting



# PIO Firmware

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- Firmware for reading Reces
  - Can also be used for alpha to alpha communication
- Designed by Rick Kwarcianny (Fermilab)
- Current design allows for 32 and 64 bit PCI transactions
- Using 64 bit burst transactions, all of Reces can be read in about 13us
  - Old style takes 48us
- Have occasionally noticed a problem when PCI and MBus hang
  - For some reason no Reces board responded on the backplane
- A newer design will timeout if a board doesn't respond.
  - Still need to test this
  - Plan to test during beam studies and eventually put into system
    - Requires configuration write to enable timeout feature and set the timeout time



# Pipeline Fpga

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- Control of MBus loading now in firmware
- Reduces number of PCI reads/writes required by software
  - Saves a few us per event
- Allows startload to be sent whenever L1A arrives
  - Better pipelining performance
  - Versus waiting to get to that point in code loop
- Backend of L2-TS handshake put in firmware. Saves about 2us
- Tests were done without any errors.
- New code written to use fpga and has been tested



# Tests

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- Run 152137 tested new firmware with beam
  - But no SVX
- Ran for an hour at L1A rate of 3.6Khz
  - Had 1.2 seconds of downtime
- TrigMon and Trigger rates looked good
- Code and firmware tested yesterday without beam
- Plan to test with beam and SVX today.
  - If beam test is successful then will become default
- Need to make new tagsets for cosmic runs



# Other news

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## – DCAS Monitoring

- Rare DCAS error where tower usage bits are wrong although clustering in TL2D correct based on actual energy data. However shows up as Clist error in TrigMon.
- Monica working to put DCAS monitoring into Trigmon

## – DCAS backplane

- Still need to replace DCAS backplane in crate with errors.
- Monica will be on shift for a week starting next Friday (?)

## – Isolist pass 1

- Test of hardware shows that Isolist correctly sends just pass 1 clusters
- TrigMon code has been fixed to account for this.
- Will become the default shortly

## – VME readout

- Code kludge by Arnd for Block Transfers didn't work
- Will need a blue wire plus firmware change to use VME BLT readout
- Plan to reduce TL2D size using Readout Lists
  - will save about 2Kbytes per event (most of the bank)
  - This will solve the problem of L2 readout time being too long