Test the AIDA Mezzanine ASIC Card

It is assumed that the user of this document is familiar with the MIDAS browser controls and the AIDA system. The system should be checked for correct operation using a known working mezzanine and this procedure prior to use.

This test is to validate the AIDA Mezzanine functionality.

The Mezzanine should have four ASICs mounted and have the copper block in place.

Test procedure.

1. Set a PB-5 up for remote control by a Linux PC. Set the PB-5 to +ve , tail pulse 1v , 100Hz and tail 1mS and 2x attenuation. Use a USB to serial cable. You may need to CHMOD the /dev/ttyUSB# with 777 to allow the program to connect.
2. On the Linux PC start a command tool and cd /disc/fcc/C-files. Run the Pulser program with no steps by typing "./PB-5_Comms.o <ttyUSB number> P 1.5 N" The program will start and prompt for a return when it's ready to start. Hit return to start the pulser.
3. Start a further command tool.
4. Cd /MIDAS/TclHttpd/Linux64
5. Start a server in the Linux PC using the command "./TclHttpd-server -port 8800"
6. Start a firefox. Navigate to http://localhost:8800 This will be used for some spectra and the Quality testing. Referred to in the following as 8800 server.
7. Open a histogram browser, a control window and through that the Quality window. DO NOT attempt to control nnlycca5 from this 8800 server.
8. In a separate workspace start another firefox. This firefox will control the operation and setup of the FEE64. Aka nnlycca5 control.
9. Open a command tool and start Putty connected to the FEE64 console USB cable. You may need to CHMOD the /dev/ttyUSB# with 777 to allow Putty to connect.
10. Setup the Mezzanine test FEE64 board with the power supplies, HDMI cable , console cable, pulser input pcb, PB-5 and Ethernet. At the time of writing nnlycca5 is mounted on some copper clad FR4 with the threaded pillars ready to receive a mezzanine.
11. Fit the mezzanine.
12. Connect the pulser input pcb to the mezzanine input connector.
13. Power-up and check the FEE64 boots ok by monitoring the FEE64 linux console.
14. Navigate to http://nnlycca5:8015 and operate RESET/SETUP/GO. Enable histogramming. Start ASIC readout.
15. In the ASIC Control window operate the "Check ASIC Load" several times with the "act on all" box ticked. Check the load is all OK.
16. Check the Rate spectrum for the ASIC readout channels is correct and flat with no missing channels.
17. Check the Hitrate spectrum is flat with no missing channels.
18. Enable all the waveform LED channels for negative operation with threshold set for 7000.

19. Check the Rate spectrum and the two blocks of 64 channels should be complete. One is for the waveform and the second is for the timing Vernier. If they are not then try STOP/GO to see if that solves the problem.
20. Using the 8800 server histogram browser setup for 16 galleries. Setup for only waveforms using *W in the Spectrum Name input box.
21. Select all 16 spectra for an ASIC and check they are all showing waveforms correctly.
22. Repeat for each of the four ASICs.
23. Disable all the waveform LEDs.
24. Stop the PB-5_Comms program and start it with "./PB-5_Comms.o <ttyUSB number> P 4.0" The program will prompt all histograms to be "Zeroed" when it's ready to start.
25. At nnlycca5 RunControl zero the histograms.
26. Enter return for the PB-5_Comms program to start producing pulses. There will be 10 steps from the entered value (4.0) down to 0.
27. Check the Rate spectrum on the nnlycca5 control browser for all channels operating.
28. Check one of the .L spectra for the peaks appearing as the pulser program steps through the 10 values.
29. When the program has completed.
30. Start the PB-5_Comms program with "./PB-5_Comms.o <ttyUSB number> N 4.0" for the negative test.
31. STOP nnlycca5. Open the ASIC4 control window and select negative for each ASIC. In the ASIC Control window operate the "Check ASIC Load" several times.
32. GO nnlycca5 and start ASIC readout.
33. Enter return for the PB-5_Comms program to start producing pulses. There will be 10 steps from the entered value (4.0) down to 0.
34. Check the Rate spectrum on the nnlycca5 control browser for all channels operating.
35. Check one of the .L spectra for the peaks appearing as the pulser program steps through the 10 values.
36. When the program has completed.
37. Save the .L Histograms.
38. On the 8800 server Quality page update the Directory List. Choose the latest Histogram directory. Update the Histogram List. Set the Linearity Report Level to 1 to only show the failing channels.
39. Check all .L Peaks for linearity. The report will show those channels with peaks outside the test conditions of FWHM <20 , linearity <0.1%.
40. If errors are seen then study the report or set the Linearity Report Level to 0 to show all the channels test results.
41. Also check the spectra to get a better idea of the problem using one of the Histogram Browsers.
42. Make an informed decision as to whether the mezzanine is operational.