Detector Support Group

Weekly Report, 2017-02-01

State of Play

Magnets

Solenoid

- Writing draft version of Solenoid Pre-Power-Up Interlock Checkout Procedure document.

Torus

- Investigating timing gaps in EPICS Fast-DAQ data.
  - ✶ Problem seems to be on the EPICS side.
- Investigated ways to auto-recover from Cerenox LV Excitation 325 [K] bug.

Gas System (KPP)

- DC, SVT, LTCC, and HTCC are in purge mode.

HDice

- Changed Oxford iPS 120 drivers to VISA in Rotation of Target Polarization Program.
- Changed Oxford iPS 120 drivers to VISA in NMR program.
- Debugged incorrect ramp rate in NMR program.

SVT

- Investigated interlock tripping of chiller.
  - ✶ No spares for Proteus Industries sensors or the Florite 990x Controller used on the chiller.
- Verified connections on patch panel after move.
- Got networking up and running on Hall B devices
- Gain scans run on all modules.

RICH

- Penetration permit submitted to group of SMEs for review.
- OSP for running in EEL building approved.

Forward Tagger

- Added calorimeter and hodoscope threshold controls to the user interface program of hardware interlock system.

Product Evaluation

- Axetris MFC product evaluation: Set up mass flow controller on computer and connected with provided software. Tested ability to change flow demand and square wave pattern settings.
  - ✶ Requested Tim Whitlatch to be DA for test setup.
  - ✶ Requested LabVIEW subVI directory from Axetris.

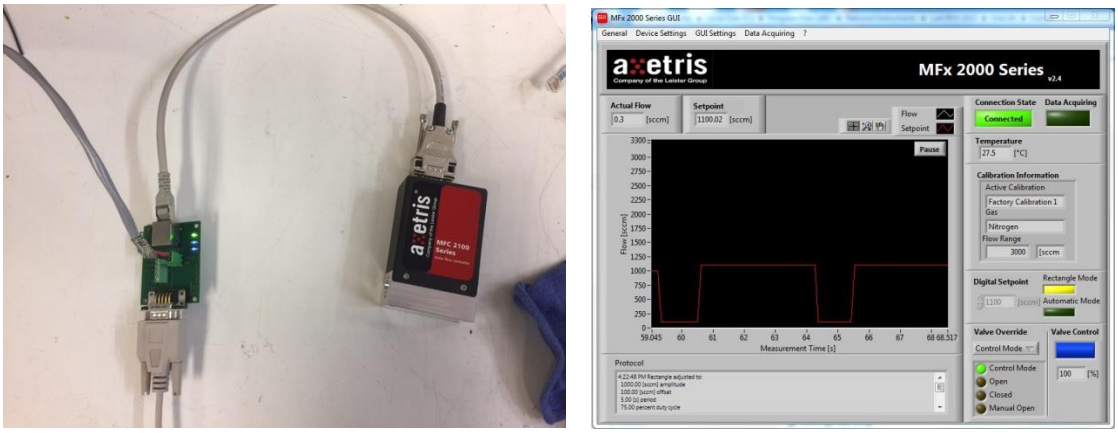

Figure 1 Axetris communications PCB with the MFC and GUI.

Antonioli, Mary Ann

- Continued writing **RICH** interlocks note. More information needed to continue.
- Began reviewing SVT interlocks LabVIEW code, which will be used as a basis for RICH code.

- Worked on connection between computer and cRIO.
  - ✶ Downloaded needed software, solving problem of finding cRIO.
  - ✶ A communication problem persisted, even after multiple software downloads, uninstalls, and more downloads.

Arslan, Sahin

- With Mindy, modified **RICH** gas panel to comply with DA requirements.
  - ✶ Added reducer, nylon tubing, and ferrules.
- Continued cabling **SVT**, patch panel, chiller, and gas lines; fabricated 10' ground cable.
- With Mindy, modified (cut, added, relocated) **gas system** in gas shed to comply with DA requirements.
- With Mindy, fabricated two cables and ground two cRIOs to rack for **Torus**.

Bonneau, Peter

HDice

- Programming and testing CAENels CT-Box prototype firmware V1.040.
  - ✶ Completed rewriting LabVIEW device drivers to add external triggering option while acquiring data in oscilloscope mode.
  - ✶ Current transducer head was reattached to CT-Box and calibrated for acquisition mode testing.
  - ✶ Initial device driver testing showed (as expected) a TTL output trigger equal to CT-box acquisition rate.
  - ✶ Started modification of CT-box data acquisition for trigger testing.
- Worked with Amanda on debug, test, and documentation of the NMR programming and instrumentation. Provided analysis of NMR program issues during December testing.

Magnet Systems

- Timing gaps in EPICS Fast-DAQ data are being investigated. No time gaps are present in LabVIEW output data stream or EPICS live Fast-DAQ data. Only EPICS data-logged data is showing time gaps.
- Reviewed Solenoid vacuum system PLC signals. TC8600 solenoid vacuum signal on P&I diagram should be CG8600TB.
- Monitored and analyzed data from Torus cryogenic and power supply status and instrumentation via EPICS while being tested at 1900 A in preparation for KPP run.

Forward Tagger

- Added calorimeter and hodoscope threshold controls to the user interface program of hardware interlock system.
- Started LabVIEW subroutines for interlock trip response logic.
- Tested user interface messaging to the cRIO Real Time program.

SVT

- Investigated interlock tripping of chiller.
  - Instability in SVT coolant temperature signal was found, on both EPICS and hardware interlock ADCs.
  - Low temperature trip recorded at -25 C is equivalent to 0.00 V (open) on ADCs.

- Held daily meeting on Hall D status and EPICS controls monitoring.
  - Solenoid was ramped to 1350 A for run.

Campero, Pablo

Magnet- Solenoid

- Researched instrumentation.
  - Verified location for NBX modules
    - 490 NBX was installed.
    - 435 NBX is waiting to be installed.
  - Updated networking spreadsheet with proper IP address and host names of NBX modules.
  - Compared 490 NBX used for Torus and Solenoid
    - Found variations in hardware appearance.
    - Researched if firmware of 490 NBX can be set up on a 435 NBX.
- Wrote draft version of B000000400-P005 Hall B Solenoid Pre-Power-Up Interlock Checkout Procedure document.
  - Corrected tasks that were changed from Fast Dump to Controlled Ramp Down events.
  - Used Torus documentation as base to write this document.
  - Verified updates made in Torus interlock system.
    - Logic for interlocks Torus PLC routines was changed.
    - ESR signals are not interlocked, but were changed just to be warming signals.

Magnet- Torus

- Monitored and used EPICs screen for Torus magnet during power up.
  - Torus magnet has been ramped up to 1900 A, kept at that current for 10 min, and then ramped down to 0 A, taking ~22 min.
  - Software comparators (C4, C5 and C6) were removed from Fast Dump for this test.
  - Noticed that “Slew” is not a set point anymore on MPS control screen.
    - Fixed values for ramp rates were added in Torus PLC program.
    - They need to be tested and monitored in MPS screen during ramp down of magnet.

- Monitored and analyzed daily logbook entries and EPICs screens.
  - Solenoid magnet was energized to 1350 A.
  - On 1/31/17, temperature in coil 3 increased for TP4 to ~134 K.

- Updated drivers for LabVIEW 2015 SP1 and installed LabView 2016 on DSGPLC1- PC.

Eng, Brian

SVT

- Verified connections on patch panel after move. Still a few flakey sensors that need to be debugged further, but since many are redundant, they've been disabled from alarms for now.
- Got networking up and running on Hall B devices, though VXS crates need rebooting to get online.
- Gain scans run on all modules; found loose faraday cage ground because of high noise.

Magnets

- Sahin and Mindy installed ground cable on FastDAQ cRIOs. Cuevas mentioned need to verify rack is actually grounded since not all of them were properly installed (still might have rubber shipping hardware installed).

Gas System

- NI had closed support ticket dealing with EPICS client PV issues when using a realtime-executable on 9035 cRIOs; has been reopened.

Hoebel, Amanda

HDice

- Changed Oxford iPS 120 drivers to VISA in RoTP program.
- Changed Oxford iPS 120 drivers to VISA in NMR program.
- Debugged incorrect ramp rate in NMR program.
    - ✶ Problem found to be precision of field readback.
        - ▪ Read Field VI reads ramp rate of 0.03 A/min, should read 0.039 A/min.

Jacobs, George

GAS Systems

- Conversations with procurement concerning new bulk liquid N_2 and Ar contract bidding status (SOTR).
- Placed PR for LN_2 and LAr bulk gas for initial funding of new contract (SOTR).
- Continued modifications of DC Gas piping in 96B toward pressure systems compliance.
- Updated DC Gas P&I diagram to reflect changes made, added relief valves, flow limiting orifices, and supply/exhaust manifold details.
- Updated DC gas system component spreadsheet for pressure system folder.
- Updated SVT N_2 purge P&I diagram for KPP run.
- Continued modification of RICH gas panels IAW DA requirements.
- Discussions with Dave K on Hall B N_2 distribution system pressure system requirements.

- Placed FML work request to wire cords on new GC gas pumps.
- Repairs to lighting in EEL 124 clean room complete. All lights now work properly.

Leffel, Mindy

- Continued organizing **HDice** pump cart photos.
- Worked with Sahin reconfiguring **gas** lines in gas shed.
- Worked with Sahin connecting **SVT** chiller to patch panel.

- Worked with Sahin reconfiguring **RICH** gas lines on gas panel.
- Terminated and attached grounding jumper from **Torus** cRIO to rack.

Lemon, Tyler

Torus

- Investigated cause and solution for time gaps seen in EPICS recorded FastDAQ data.
  - EPICS recorded FastDAQ shows time gaps of 200 ms.
  - Time gaps do not appear in LabVIEW data arrays from FPGA, LabVIEW data arrays before sending to EPICS, data arrays of shared variables used to send FastDAQ data to EPICS, and on EPICS Live FastDAQ screen; time gaps only show on EPICS recorded data.
  - Time gaps may be due to write speed of data to disk on EPICS side.
- Investigated ways to auto-recover from Cerenox LV Excitation 325 [K] bug.
  - "Cerenox LV Excitation 325 K bug" occurs when a Cerenox sensor in LV Excitation Chassis jumps to and maintains temperature reading of 325 K.
  - Current fix is manually restarting LabVIEW program, which runs Cerenox initialization algorithm.
  - Auto-recover solution will fix bug without any user input.
  - Investigated solution is to watch for ten seconds of 325 K Cerenox readings and then perform Cernox initialization algorithm.

Solenoid

- Added updated calibration curves for load cells to LV Excitation cRIO.
  - Updated calibration curves received from Solenoid manufacturer.

RICH

- Troubleshooting cRIO connection issues with Mary Ann.
  - Could not connect to RICHCRIO on Mary Ann's PC.
  - Reinstalled cRIO drivers, VISA drivers, and LabVIEW 2015 to fix issue.
  - Reinstallations could not fix communication errors.

- Monitored logbook and EPICS on a daily basis.
  - Noted Solenoid ramped to 1350 A with no issues on 2017-01-30 for spring run.

McMullen, Marc

Gas System

- HTCC
  - Flowing CO_2 @ 6.5 Lpm during purge, moisture reading 360 ppm (down from 450 ppm last week).
  - Ran from SFL3S to SFL0S two cables, which will be permanent signal cables for moisture and differential pressure.
- Flowing Ar/CO_2 @ 4.45 Lpm through sector 2 for all regions of the **DC**
- Flowing N_2 @ 0.5 Lpm through each sector of the **LTCC**

RICH

- Submitted penetration permit to group of SMEs for review.
- Approved OSP for use in EEL building.