Detector Support Group
Weekly Report, 2018-09-26

Summary

Hall C
- Dipole Filed regulation program modified.
  - ✶ Reset option added for timer used to check "Dipole status: Ready".
  - ✶ Timer delay for filtering option in magnetic field readouts removed.
  - ✶ Timer and tag modified in rungs 4, 5 and 6 in Calculate_DI_current PLC routine.
  - ✶ Added functions and modifications tested.
- For "End of life for Windows 7 and upgrade to Windows 10" task:
  - ✶ Computer center requested to correct IP-address for dsg-hallc-6 PC
    - ▪ IP address had been incorrectly changed by the computer center after the computer was rebuilt.
    - ▪ IP address corrected to be used on Hall C dev subnet (129.57.195.31).
  - ✶ Dsg-hallc-6 PC, which is running Windows 10, was connected to SHMS PLC (Controller with firmware v20.58).
    - ▪ No communication or compatibility issues found.

Hall B Magnets
- *Solenoid Voltage Tap Values at Fast Dumps* table updated.
  - ✶ Fast dump events 8 and 10, which occurred on 12/14/2017 and 12/18/2017, added.
  - ✶ FastDAQ data with –S (Synchronization) –J (Remove Jitters) and –D (Remove duplicate Timestamps) options were used to analyze potential causes of Solenoid fast dumps.
    - ▪ There were differences between data analyzed with –JDS and data analyzed with –JS options.
    - ▪ Found that the culprit for fast dump that occurred on 12/18/2017 was either QD1 or QD2.

RICH
- MYA archival request submitted for HV and LV voltage set point, voltage monitoring, current set point, and current monitoring.

HDIce
- Fast Resonance Scanner (FRS) program debugged.
  - ✶ RF generator (model R&S SMY01) indicated an internal failure on its front panel.
  - ✶ RF generator needs to be replaced by HDIce group.

FT
- Condensation sensor trip investigated for hardware interlocks.
  - ✶ Sensor had tripped the LV/HV interlock.
  - ✶ Sensor had not been installed and most likely made contact with a conductive surface, causing trip.
    - ▪ Sensor has been disabled in the interlock program until it can be installed.
  - ✶ Reset of the interlock trip was not responding to the FT group's reset.
    - ▪ Most likely they did not press and hold down the reset button.
    - ▪ The response to clear interlocks can be slow and may require the button to be held down for ~2 seconds to register.

Gas Control
- Diagram created for RICH N_2 System Back-Up supply.

Hall D
- cRIO on Hall D subnet verified to correct the offset from the PLC.
- PXI tested after solenoid dump to confirm proper operation.

CRIO Test Station

- 9205 module differential nonlinearity ±1 V range completed, with Krohn-Hite, in manual mode.
- 9205 module differential nonlinearity ±0.2 V range written and tested, with Krohn-Hite, in manual mode.

MPOD Test Station

- Low voltage (LV) card voltage accuracy test developed in LabVIEW.
  - Test sets channel output of MPOD LV card to a voltage and measures output with external Keithley 2002 multimeter.
  - User has control over which channels to test, amount voltage is incremented by for measurements, maximum voltage MPOD output is set to, and number of samples taken for each voltage and channel.
  - SubVI developed to check whether MPOD has LV card installed in declared slot.
  - SubVI developed to study timing of data acquisition from MPOD readback and Keithley 2002 readback.
    - SubVI used to optimize runtime of program.
    - Found that when DAQ rate is set to 4 Hz, timing is consistent and does not change between measurements.

Antonioli, Mary Ann

- cRIO test station.
  - ✦ Completed 9205 module differential nonlinearity ±1 V range, with Krohn-Hite, in manual mode.
  - ✦ Wrote 9205 module differential nonlinearity ±0.2 V range, with Krohn-Hite, in manual mode; tested OK.

- Completed reformatting Notes webpage.
- Formatted and edited Note on CT-BOX.
- Formatted and edited Note on PXI calibration.

Bonneau, Peter

HDice

- Worked with Amanda, Tyler, and Pablo on troubleshooting reliability issues on HDice rack #1.
  - ✦ RF failed during while running the Fast Resonance Scanner (FRS).
  - ✦ RF generator (model R&S SMY01) indicated an internal failure on its front panel.
  - ✦ Computer crashes caused last week's failures.
  - ✦ Conclusion: Antiquated HDice instrumentation and computer cause reliability issues on rack #1; *not the upgrade work done by DSG*.
  - ✦ DSG recommended to improve reliability of rack #1 by doing the following:
    1. Replace RF generator model# R&S SMY01 (discontinued by manufacturer years ago) with the same model used in rack #2.
    2. Replace or repair computer.
  - ✦ The LabVIEW FRS program has not changed from the working version on rack #2.
- Completed DSG note on the CAENels CT-box current measurement system.
- Worked with Mindy on the hardware upgrade of RF splitter / attenuator box #2.
  - ✦ Pull-down resistors were added on the 7053D input module. (same as box 1)
  - ✦ RF box #2 passed LabVIEW hardware test programs.

FT

- Raffaella De Vita requested DSG to investigate issues with the FT Hardware Interlock System.
  - ✦ The condensation sensor had tripped the LV/HV interlock (which is not installed in the calorimeter).
  - ✦ Reset of the interlock trip did not respond (remotely from Italy).
  - ✦ The sensor measures condensation by conductivity. If the uninstalled sensor makes contact with a conductive surface, it will trip.
  - ✦ The condensation sensor has been disabled in the interlock program.
  - ✦ The reset response is slow sometimes, possibly due to high network traffic / GUI / EPICS response time.
  - ✦ EPICS reset procedure: press and hold the button down until the tripped interlock clears.

Hall D
- Attended Hall D Slow Controls Meeting.
  - ✶ Controls development for ComCal & DIRC progressing.
  - ✶ ComCal temperature monitoring instrumentation ready for installation.
  - ✶ DIRC Interlocks have been completed but limits have not be established.

Campero, Pablo

Hall C
- Modified Dipole Filed regulation program
  - ✶ Added reset option to timer used to check Dipole status: Ready.
  - ✶ Removed timer delay used for filtering option in magnetic field readouts.
  - ✶ Modified rungs 4, 5 and 6 in Calculate_DI_current PLC routine.
  - ✶ Tested added functions and modifications.
- With regards to task: End of life for Windows 7 upgrade to windows 10.
  - ✶ Requested computer center to correct IP-address changed for no reason on dsg-hallc-6 PC. IP address corrected to be used on Hall C dev subnet (129.57.195.31)
  - ✶ Connected to SHMS PLC (Controller with firmware v20.58) from dsg-hallc-6 PC, which has windows 10 running.
  - ✶ No communication or compatibility issues found.
- Updated Hall C PLC tasks table and compiled Hall C weekly report.

Hall B Magents
- Updating *Solenoid Voltage Taps Values at Fast Dumps* table.
  - ✶ Completed fast dump event 8 and 10 occurred on 12/14/2017 and 12/18/2017.
  - ✶ Used FastDAQ data with –S (Synchronization) –J (Remove Jitters) and –D (Remove duplicate Timestamps) options to analyze potential causes of Solenoid fast dumps.
  - ✶ Analyzed data available in logbook entries associates with each fast dump event.
  - ✶ Noticed differences between data analyzed with –JDS (analyzed now) and data analyzed with –JS options.
    - ▪ Found that VT18_DAQ voltage tap was not the culprit for fast dump occurred on 12/18/2017.

- Assisted Siemens NX9/NX11 software used to drafting, modeling, and assembly class.
- Collaborated with Mary Ann to debug **cRIO Test Station** LabVIEW program.

Eng, Brian

Hall D Solenoid
- Verified that the cRIO on Hall D subnet can correct the offset from the PLC.
- Tested PXI after solenoid dump to confirm proper operation (it is fine).
  - ✶ https://logbooks.jlab.org/entry/3596262

Hall B SVT
- Tried to start testing kludged SVT modules, but found that the logbook API had been updated and now required at least Java 7 and the IOC in EEL/124 (which runs CentOS 5) only has Java 6. Eventually Sergey got Java upgraded and the logbook entry functionality

was fixed after it was verified that doing so would fix the errors on a separate CF based IOC (the SVT ones are all netboot)

Hall B EPICS
- Found that the FM weather station has died again (granted it is slightly different than previous problems). Currently all the values except the barometer aren't changing. FM has said they will look into it in the next day or so.

Hoebel, Amanda
HDIce
- Debugged NMR Rack #1.
  - ★ FRS program was not working properly.
  - ★ Problem was found to be the RF generator unit stopped working.
    - Status light was blinking and gave error code "level not satisfied".
    - Unit was old and needed to be replaced.

- Made Current Loop Regulation PLC Program note.
- Started work on RF Box program.
    - Signal generator will send signal to RF Box.
    - Program will set RF level in RF box.
    - Signal will be read from scope and attenuation level analyzed.
- Monitored EPICS and logbooks for Halls B, C, and D.
- Put together the weekly report.

Jacobs, George
GAS Systems
- RICH N2 gas system note in progress.
- Requested price and availability for pneumatic valve for RICH back up N2 supply.
- Created RICH N2 System back up supply diagram.

Leffel, Mindy
Gas System
- Continued fabricating MFC power chassis.
  - ★ Cut second set of fuse wires and crimped terminal lugs.
  - ★ Cut wires for inline resistors and crimped fork spade lugs.

Lemon, Tyler
- Submitted archival request for **RICH** HV and LV voltage set point, voltage monitoring, current set point, and current monitoring.

MPOD Test Station
- Developed low voltage (LV) card voltage accuracy test in LabVIEW.
  - ★ Test sets channel output of MPOD LV card to a voltage and measures output with external Keithley 2002 multimeter.

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- ✦ User has control over which channels to test, amount voltage is incremented by for measurements, maximum voltage MPOD output is set to, and number of samples taken for each voltage and channel.
- ✦ Developed subVI to check whether MPOD has LV card installed in declared slot.
- ✦ Developed subVI to study timing of data acquisition from MPOD readback and Keithley 2002 readback.
  - ▪ SubVI used to optimize runtime of program.
  - ▪ Found that when DAQ rate is set to 4 Hz, timing is consistent and does not change between measurements.

McMullen, Marc

Hall B Gas Controls

- Continued work on the multi plot display.

RICH

- Discussed plans to mitigate an unplanned gas outage. The plan would use HP N2 cylinders to supply the detector during an outage. Sent out mitigation plan to Hall B and Physics management. Physics management has agreed with the plan and has communicated with Hall B Engineering/Mechanical.
- Hall B mechanical has installed an isolation valve for the N2. This will allow the gas supply to be turned off on one of the areas (space frame or forward carriage) without affecting the other. During installation of the new valve, N2 was cut off to the RICH for ~25min. DSG has communicated with Hall B Engineering about the need to relay information anytime gas is being shut off, especially to the RICH.

DSG

- Completed flow diagrams for all gas controls sub-systems.