Detector Support Group

We choose to do these things "not because they are easy, but because they are hard".

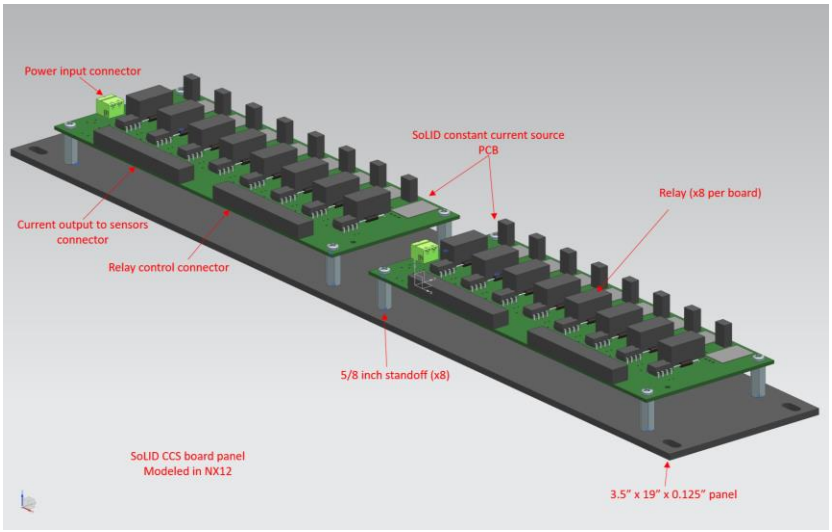
Weekly Report, 2021-11-10

Summary

Hall A – SoLID

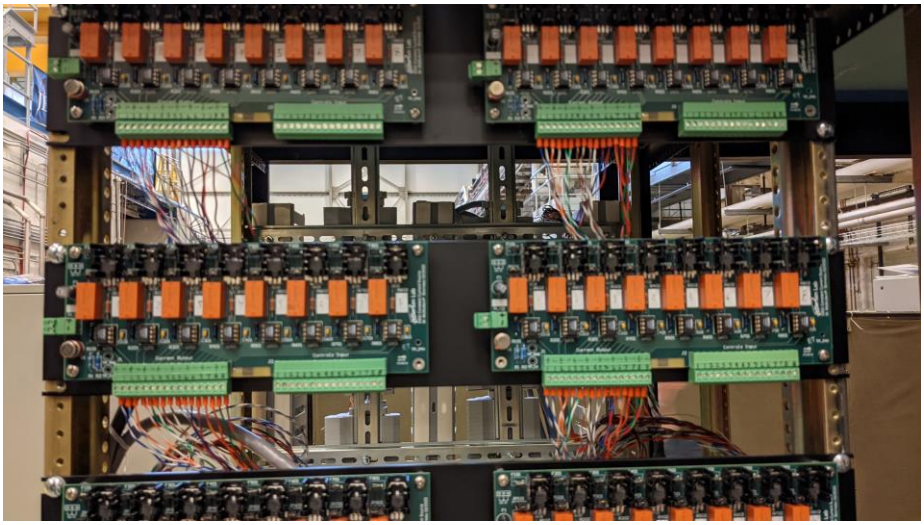
Mary Ann Antonioli, Pablo Campero, Brian Eng, Mindy Leffel, and Marc McMullen

- Completed, using NX-12, three-dimensional model of the constant current source (CCS) boards and mounting plate to be included in a model of the magnet controls rack

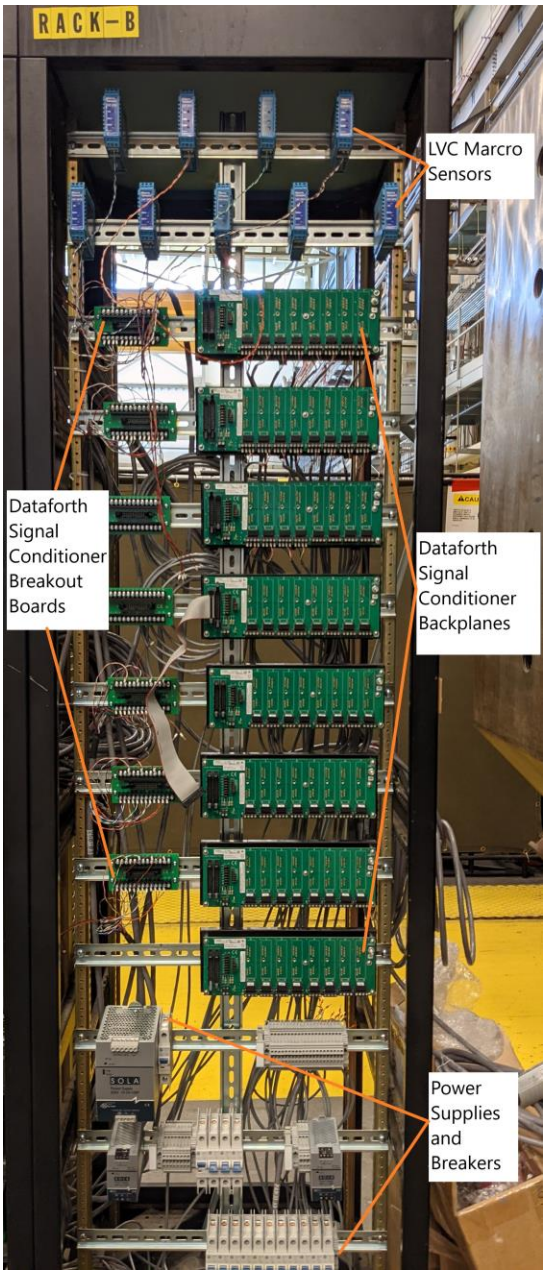


Three-dimensional model of CCS boards and mounting plate

- Wiring instrumentation racks #1 and #2
  - ✶ Wired intra-rack connections for Solenoid and CCR temperature sensors from terminal strips to signal conditioners and from terminal strips to CCS boards
  - ✶ Wired load sensor signals from terminal strip to signal conditioning boards and from signal conditioning breakout boards to PLC terminal strips



CCS boards wired in rack #1 front panel



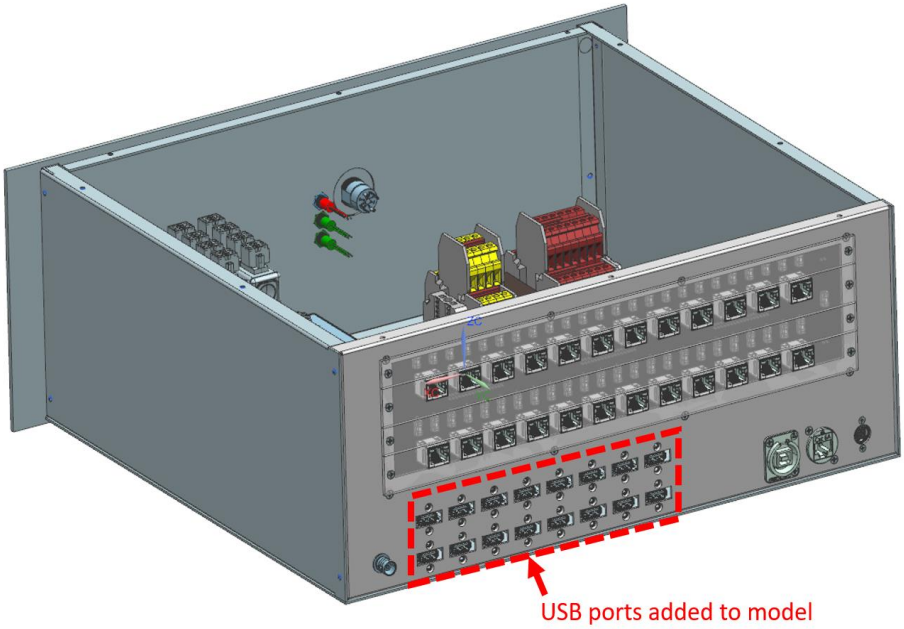
Instrumentation rack #2 front panel

- Updated *Cable Information* spreadsheet
  - ✶ Added information for 11 cables: cable lengths, stripping length, labels, and cable termination (for both ends)
- Cut and stripped ferrule-to-ferrule cables: two 20-conductor and 25 4-conductor
- Completed drawings: *Primary and Redundant PLC Chassis Layout, Transfer Line HX Interconnect System Diagram, HX JT Valve Motor Drive Wiring Diagram,* and *HX JT Valve Controls Cable Diagram*

Hall B – RICH-II

Mary Ann Antonioli, Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, and Marc McMullen

- Using the hardware interlock system software, tested the SHT-35 sensor board with a defective sensor
    - ✶ As expected, the software generated a valid CRC error; unexpectedly, the FPGA Command Engine did not timeout – debugging in progress
- Added 16 USB feedthroughs to hardware interlock chassis' NX-12 model for gas system expansion cRIO



RICH-II hardware interlock chassis with added USB ports for gas system expansion cRIO

Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, and Marc McMullen

- Researching conducting Ansys thermal simulations and exporting analysis results using Python scripting
    - ✶ Generated temperature results of each mesh node for static thermal simulation
- Researching communication with Keysight mainframe via Python script
    - ✶ Two Python packages can be used for communication: *PyVISA* and *python- vxi11*
    - ✶ Able to query channel readback using both packages – used web interface to verify results of commands issued with Python
- Worked on ESR film pre-shaping – 230 of ~600 films complete
- Completed converting CAEN HV module trip test plots from PNG to PDF format to include them in the NPS testing and analysis database – all 1188 channels completed

EIC

Pablo Campero, Brian Eng

- Using NX-12, created a new model with Be beam pipe and Barrel L1 Si sensor (distance of separation: 1.24 mm), no PEEK rings
    - ✶ Conducted static thermal analysis: applied convection heat transfer inside Be beam pipe for Ar at 200°C and convection heat transfer on the outer face of the Be beam pipe and Si sensor for air at 22°C
    - ✶ Si sensor temperature remained unchanged at 22°C
- Completed first draft of requirements spreadsheet – used to link interfaces and requirements (e.g. beam pipe clearance, cooling for silicon, gas mixing for GEMs, etc.)

DSG R&D – EPICS Alarm Handler

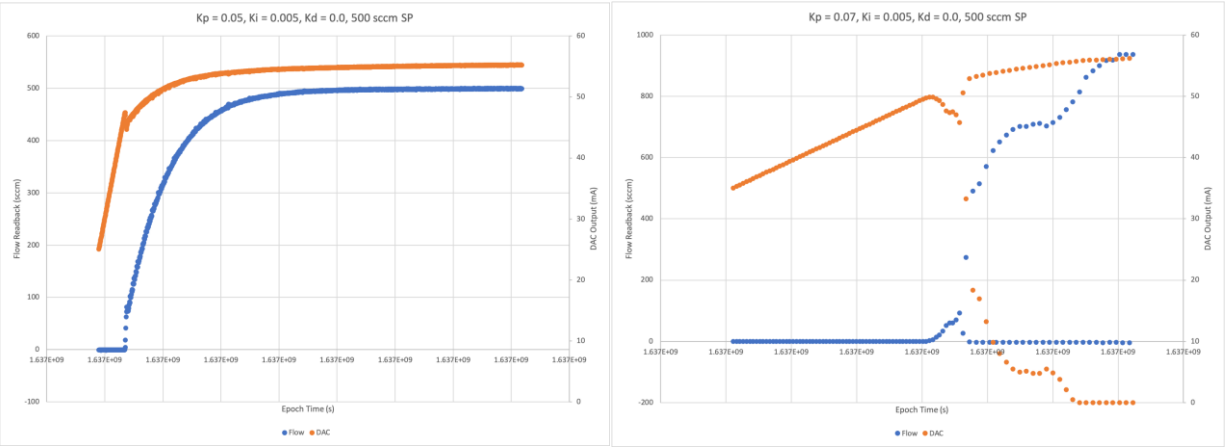
Peter Bonneau

- Investigating the development of a CS-Studio Phoebus alarm system; in addition to the main CS-Studio Phoebus window, two additional programs are needed – alarm server and Apache Kafka

DSG R&D – GEM

Brian Eng

- Investigating various PID settings – charts show different parameter settings with the same flow set-point



Stable, but slow, flow output (left) and unstable flow output (right)

DSG – Safety

Marc McMullen

- For floor repairs, moved items in EEL 124 cleanroom to completed half, clearing remaining portion of floor for repairs
    - ✶ EEL building will be closed from 6 PM to 6 AM from 11/12 to 11/15 to allow building to clear of any fumes caused by the finishing chemicals