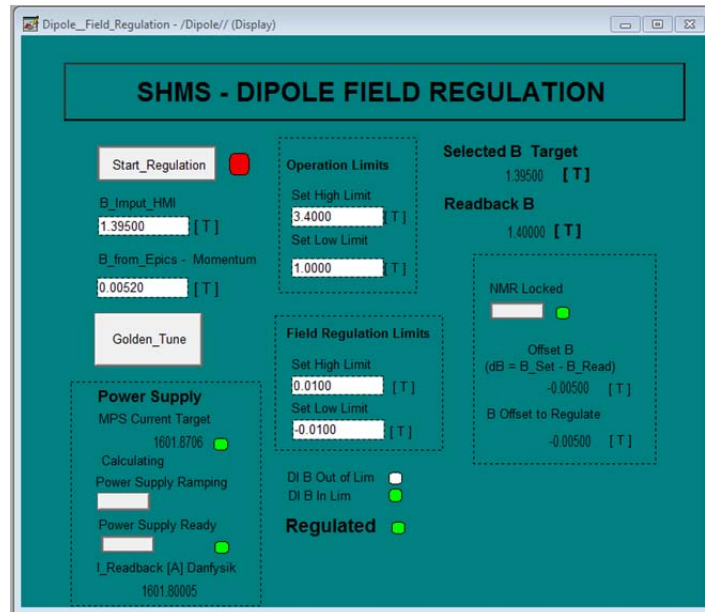


### Summary

#### Hall C

- Dipole field regulation PLC program in progress
  - ★ Testing PLC code with Python code which simulates MPS current readouts.
    - Installed Python program and RS-232 Serial Libraries on “dsg-hallc-2” computer
    - Debugged timing issues in python code, noticed delays to transfer data from serial port to PLC.
  - ★ Evaluated the possibility of adding PID control to the Dipole Regulation PLC program.
  - ★ Modified HMI test screen.



HMI screen developed to test dipole field regulation PLC code

- Debugged SBC card program used to read magnetic field from PT2026 NMR unit and send data readouts to SHMS and HMS PLCs.
  - ★ Continued developing Python code to read NMR and update tags on PLC.
  - ★ SBC card program unable to send field readouts to HMS and SHMS PLCs.
    - Error: “Insufficient memory”.
    - Found that the default module for interfacing with a PLC assumes controller is in slot 0, for both HMS & SHMS systems the location of PLC controllers is not on slot 0. Currently, SHMS PLC controller located in slot 1 and HMS PLC controller located in Slot 2.
  - ★ SBC code corrected and magnetic field readout with from PT2026 NMR unit are available in the HMS and SHMS PLCs.
- Tested remote reset functionality of PT2026 NMR unit
  - ★ Reset function command sent remotely and noticed that command worked even when PT2026 was frozen.
- Moved SBC to 2nd floor of counting house since its IP address was changed to the Hall C subnet.
  - ★ New IP address assigned: 129.57.165.21
- Installed terminal block and wires to set up connection between UPS and HMS and SHMS PLCs.
  - ★ Cabling to monitor 24 V signal for PLC controllers’ UPS installed in counting house rack.
    - Ends of cables still need to be connected to PLC channel and 24 V supply.
    - Hall C must make final connections to PLC and power supply.

# Detector Support Group

## Weekly Report, 2018-08-22

- ★ Cabling with appropriate connectors on hand for detector hut UPS monitoring, but due to limited time before run starts, this part of the task may be postponed until next downtime period.
- ★ Final connection to the PLC modules is waiting to be completed by Hall C tech.
- Completed PLC routine for monitoring UPS units.
  - ★ Code given to Hall C as PDF to be checked and downloaded to PLCs.
- DSG is waiting for information from Hall C on:
  - ★ What they mean by “Valve tune responses”
  - ★ SHMS LVDT I/O module.
  - ★ HMS quadrupoles.

### RICH Hardware Interlock System

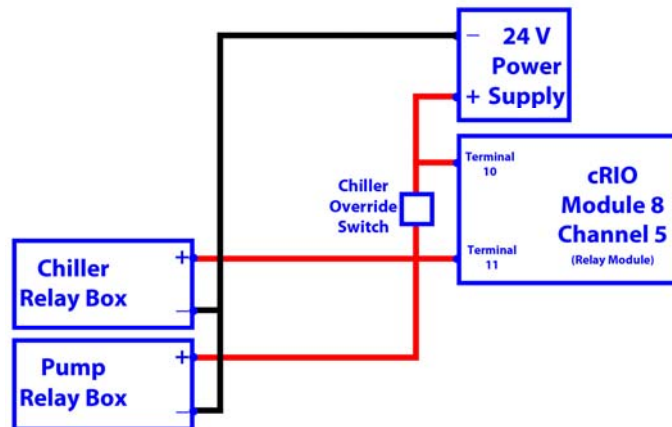
- Wired RICH N2 panel supply pressure transducer (PT) to N2 cRIO.
  - ★ Ran cable with smaller gauge wires to PT from cRIO.
  - ★ Smaller gauge wire needed to put connector on PT end of cable.
  - ★ Connector installed on PT end of cable to provide disconnect between panel and cRIO cabling in the event the panel needs to be moved.
  - ★ Wired Pressure transducer to 24 V supply and current input module (module 7, channel 4) in RICH cRIO.
  - ★ Pressure transducer readout added to N2 cRIO EPICS screen.
    - Updated screen will be pushed to *clascss* once pull request is approved.
  - ★ PT measures N2 supply pressure to be ~36 psi.

### HDice

- Developing documentation for the NMR control systems.
  - ★ Writing a DSG-note on the use of the CAENels CT-box and DCCT head in the HDice NMR system.

### SVT Hardware Interlock System

- Developed implementation plan for hardware interlocking the chiller pump.



Wiring diagram for implementation of the relay Box used to interlock the SVT chiller pump

### LTCC

- Preparing to flow C4F10
  - ★ Raised set point for S5 supply pressure.
  - ★ Dead band to open supply solenoid was raised from 0.02 inH<sub>2</sub>O to 0.05 inH<sub>2</sub>O.
- Started changes to LTCC exhaust pump controls software.



# Detector Support Group

## Weekly Report, 2018-08-22

- \* New LabVIEW program will only update the Boolean when the pressure set point is exceeded or the pressure falls below the dead band.

### RTPC

- Updated the RTPC gas system layout document.
- Updated RTPC gas system power point.
- Finalized RTPC P&I diagram.

### Hall B Gas System Controls

- MFC power chassis fabrication.
  - \* Marked, punched, and drilled holes in all three bottom panels.
  - \* Attached jumpers to all six barrier blocks.
  - \* Installed fuse holders and LEDs on two back panels.
  - \* Started measuring and cutting jumper wires.
  - \* Made changes to wiring diagram

### DSG

- Development of Python MPS simulation program continued.
  - \* Posted code to GitHub at <https://github.com/tmlemon/danfysik-simulator>.
  - \* Investigated issues that caused by discrepancies in timing and speed of Python program and PLC program.
  - \* Revised program to remove two state machines.
  - \* Removed unneeded logic or redundant checks for cases.
- Krohn-Hite simulator program in Python created.
  - \* Program responds to IDN, change voltage, and change rate commands.
- Set up cRIO Test Station to perform test on NI 9205 ADC input module at  $\pm 1V$  and  $\pm 200 mV$  range.
  - \* Connected Krohn Hite calibrator voltage source to NI 91 ADC input module.
  - \* Installed GPIB card in “dsgcomp2” computer.
  - \* Tested drivers to set voltage on Krohn Hite.
  - \* Implementation of Krohn Hite drivers to cRIO Test Station LabVIEW program in progress.



# Detector Support Group

## Weekly Report, 2018-08-22

### **Antonioli, Mary Ann**

#### **cRIO test station.**

- Worked on 37-pin D-sub connector cable for Krohn-Hite power supply to cRIO 9205 module; tested.
- Began code to test module 9205 in  $\pm 1$  V and  $\pm 0.2$  V ranges, using Krohn-Hite power supply.
- Made final edits to and posted Note 2018-11.
- Imported and formatted Note on gas system. Began editing.

### **Bonneau, Peter**

#### **HDice**

- Developing documentation and writing a DSG-note on the use of the CAENels CT-box and DCCT head in the HDice NMR system.

#### **SVT**

- SVT Hardware Interlock System
  - ★ Developed implementation plan for the requested hardware interlocking for the chiller pump.
    - A Bia-Ra model 8880-1B1Y 120V AC power reset module will be used to interlock the pump.
    - The pump interlocking logic will be the same as the chiller. They will always work together as a single action.
    - The same cRio output relay channel used for the chiller power will enable the pump power reset module.
    - The cRio front panel override key switch for the chiller will also work in tandem with the pump.
- Provided detailed analysis of recent interlock trips due to the instability of the SVT cooling system. Analysis proved that the Hardware Interlock System correctly responded to each of the trips.

#### **Hall C**

- Held daily status and planning meeting on HMS and SHMS PLC control systems.
  - ★ Work cannot start on the data-logger task request until DSG is given access to HMI licenses and permissions. Access is absolutely required to accomplish Hall C PLC data-logger task request.
  - ★ DSG is waiting for information and/or cabling work from Hall C on valve tune responses and SHMS LVDT I/O module work.

### **Campero, Pablo**

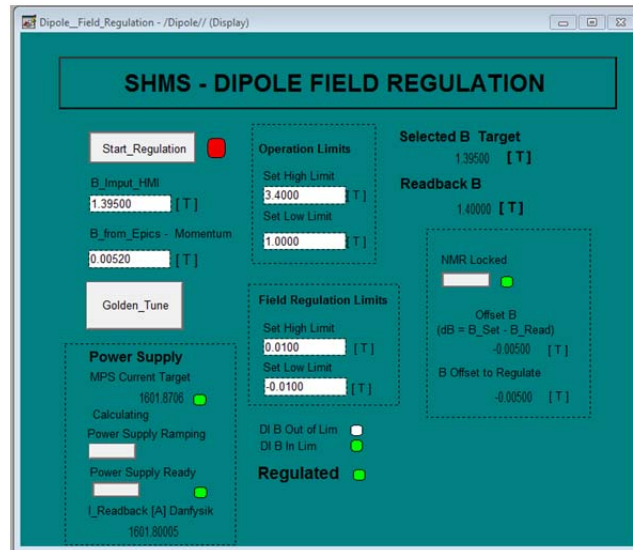
#### **Hall C**

- Dipole field regulation PLC program in progress
  - ★ Testing PLC code with Python code to simulate MPS current readouts.
    - Installed Python program and RS-232 Serial Libraries on “dsg-hallc-2” computer



## Detector Support Group Weekly Report, 2018-08-22

- Debugged timing issues in python code, noticed delays to transfer data from serial port to PLC.
- ★ Evaluated the addition of PID control to the Dipole Regulation PLC program.
- ★ Modified HMI test screen.



- With Brian debugged SBC card program used to read magnetic field from PT2026 NMR unit and send data readouts to PLC.
  - ★ SBC card program unable to send field readouts to HMS and SHMS PLCs.
    - Error: “Insufficient memory”.
    - Found that SBC program was not reading properly the location of the PLC controllers in their chassis.
    - SBC program was configured to read/write to the PLC from its location at slot 0, but PLCs for HMS and SHMS are currently located in slot 1 for SHSM and slot 2 for HMS.
    - SBC code corrected and magnetic field readout with from PT2026 NMR unit are available in the HMS and SHMS PLCs.
- With Tyler and Amanda installed terminal block and wires to set up connection between UPS and HMS and SHMS PLCs.
  - ★ Final connection to the PLC modules is waiting to be completed by Hall C tech.
- Updated DSG- Hall C PLC task list.
- Generated DSG Hall C PLC weekly report.

### DSG

- Edited and compile DSG weekly report.
- Set up **cRIO Test Station** to perform test on NI 9205 ADC input module at  $\pm 1V$  and  $\pm 200$  mV range
  - ★ Connected Krohn Hite calibrator voltage source to NI 91 ADC input module.
  - ★ Installed GPIB card in “dsgcomp2” computer.
    - GPIB card needed to connected Krohn Hite voltage calibrator source.
    - GPIB to USB connector used previously installed was removed due to connection issues.
    - Tested connection stability by sending commands to from the computer to the Krohn Hite voltage source.



# Detector Support Group

## Weekly Report, 2018-08-22

- ★ Showed to MaryAnn how to use and run drivers to set voltage on Krohn Hite. Implementing Krohn Hite drivers to cRIO Test Station LabVIEW program in progress.

### Eng. Brian

#### LTCC

- Continued preparing to flow C4F10: <https://logbooks.jlab.org/entry/3589309>

#### DC

- Connecting H2O & O2 sensors in gas shed which are connected to DC exhaust (WIP). Needed to add another ADC module.

#### Hall C

- Tested remote reset functionality of NMR, works even when frozen.
- Continued developing Python code to read NMR and update tags on PLC.
  - ★ Found that the default module for interfacing with a PLC assumes controller is in slot 0, for both HMS & SHMS systems this isn't the case.
- Moved SBC to 2nd floor of counting house since it got moved to the 165 subnet (turned out to be not needed).

### Hoebel, Amanda

#### RICH

- Went to the hall with Tyler and Pablo to “make rounds” before the hall closed.

#### Hall C

- Wrote abstract paragraph for current loop regulation routine.

#### DSG

- Created Krohn-Hite simulator program in Python.
  - ★ Program responds to IDN, change voltage, and change rate commands.

### Jacobs, George

#### GAS Systems

- Discussions about LTCC gas system with Brian and Marc
- Updated the RTPC gas system layout document
- Updated RTPC gas system power point
- Finalized RTPC P&I diagram

### Leffel, Mindy

#### Hall B Gas Systems

- MFC power chassis fabrication.
  - ★ Marked, punched, and drilled holes in all three bottom panels.
  - ★ Attached jumpers to all six barrier blocks.
  - ★ Installed fuse holders and LEDs on two back panels.



# Detector Support Group

## Weekly Report, 2018-08-22

- \* Started measuring and cutting jumper wires.
- \* Made changes to wiring diagram and review with Marc.

### RICH

- Disconnect cable between N2 RICH panel and cRIO chassis.
  - \* Terminated two conductor cables with Moles connectors on each side.
  - \* Installed cables with Mary Ann and Tyler.

### Lemon, Tyler

#### Hall C

- Completed PLC routine for monitoring UPS units.
  - \* Code given to Hall C as PDF to be checked and downloaded to PLCs at their discretion.
  - \* Cabling to monitor 24 V signal for PLC controllers' UPS installed in counting house rack with Pablo and Amanda.
    - Ends of cables still need to be connected to PLC channel and 24 V supply.
    - Hall C must make final connections to PLC and power supply.
  - \* Cabling with appropriate connectors on hand for detector hut UPS monitoring, but due to limited time before run starts, this part of the task may be postponed until next downtime period.

### RICH

- Wired RICH N2 panel supply pressure transducer (PT) to N2 cRIO.
  - \* With Mindy and Mary Ann, ran cable with smaller gauge wires to PT from cRIO.
    - Smaller gauge wire needed to put connector on PT end of cable.
  - \* Connector installed on PT end of cable to provide disconnect between panel and cRIO cabling in the event the panel needs to be moved.
  - \* With Pablo and Amanda, wired PT to 24 V supply and current input module (module 7, channel 4) in RICH cRIO.
  - \* Pressure transducer readout added to N2 cRIO EPICS screen.
    - Updated screen will be pushed to *clascss* once pull request is approved.
  - \* PT measures N2 supply pressure to be ~36 psi.
- Development of Python MPS simulation program continued.
  - \* Posted code to GitHub at <https://github.com/tmlemon/danfysik-simulator>
    - Initial versions uploaded listed under “Releases” tab.
    - Latest development version in branch “v2.0.1-improvements”
  - \* Investigated issues with Pablo caused by discrepancies in timing and speed of Python program and PLC program.
  - \* Revised program to remove two state machines.
    - Previously, one case structure created a list of “states” the MPS was in and then a second case structure performed actions based on states list.
    - Revised program combines all state actions (except simulated ramping) into one case structure.



# Detector Support Group

## Weekly Report, 2018-08-22

- ★ Removed unneeded logic or redundant checks for cases.
  - Previous version had some qualifiers for cases checked multiple times in different places.
  - Revised program consolidates actions into one case, removing need for redundant checks.

### McMullen, Marc

#### DC

- Terminated O2 and moisture sensor cables which were relocated to the DC exhaust.
- Performed some troubleshooting of the R1-2 exhaust moisture channel; this unit may need replacement.

#### LTCC

- Started changes to LTCC exhaust pump controls software.
  - ★ The current software continuously writes values to the shared variables.
  - ★ The new software will only update the Boolean when the pressure set point is exceeded or the pressure falls below the dead band.
- Wrote DSG document on the Hall B Gas Controls.
  - ★ The document gives details on how the system ran during RGA (spring run), as well as configuration changes made for RGB (fall run.)