



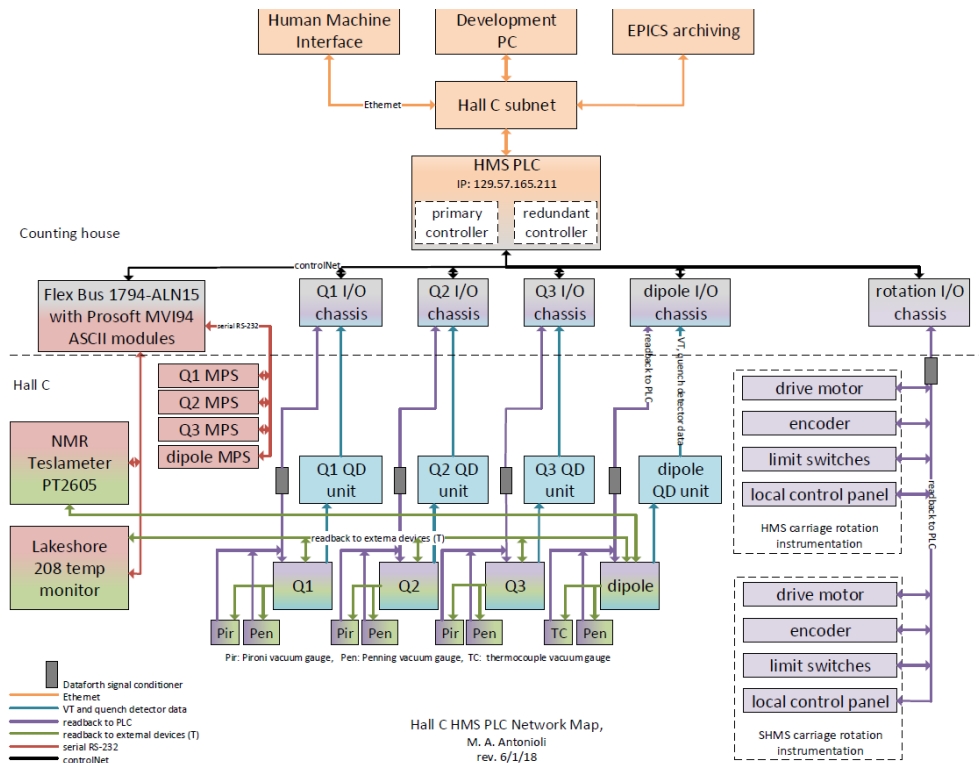
Detector Support Group

Weekly Report, 2018-05-30

Summary

Hall C

- Generated Networking spreadsheet for Hall C PLCs and devices connected to the Hall C and Hall C Dev Subnet.
 - ★ Spreadsheet contains information about the IP addresses, MAC addresses, serial numbers, Host names and physical locations of each PLC and device.
- Updated HMS networking map to include vacuum system.



First version of Hall C Network topology

- Worked on NMR PT2026 Tesla Meter communication with PLC.
 - ★ Debugged Ethernet communication with PT2026 Tesla Meter.
 - Configured DNS and Domain to set up PT2026 Tesla Meter on the Hall C Dev subnet.
 - Created Ethernet VISA TCP/IP resources to connect PT2026 Tesla Meter via its Ethernet port.
 - Tested LabVIEW Ethernet communication with LabVIEW drivers.
 - Tested Ethernet communications by sending SCPI commands, verified proper responses.
 - ★ Upgraded firmware for 490 NBX module.
 - ★ Configure and connected 490 NBX modules to talk with DSG-PLC and PT2026 Tesla Meter.
 - Configured TCP Port number and IP address.
 - Connected 490 NBX modules with PT2026 Tesla Meter.
 - Found problems sending commands and reading responses from the PT2026. Debugging in progress.
 - ★ Assigned new IP address for the 1756-L72 ControlLogix PLC (dsg-plc) to connect with Hall C Dev Subnet.
 - Dsg-PLC is intended to be used for the NMR communication test.
 - Configured and updated firmware for 1756-EN2T module.
 - Configured Ethernet/IP drivers on RS-Link Classis to communicate PLC in Hall C Dev Subnet.
 - ★ Wrote PLC test program to send and receive command from PT2026 Tesla Meter through 490NBX module.
 - Test program sent commands to 490 NBX modules without problem.
 - Debugging reading data from the PT2026 Tesla Meter.



Detector Support Group

Weekly Report, 2018-05-30

- Acquired two RS-Logix5000 licenses Full edition
 - ★ Generated CCPR to run licenses on Computer Center server.
 - ★ Server computer will be supported by computer center
 - ★ Requested limited access for users to use the licenses.
- Generated first version of PLC layouts spreadsheet for HMS PLCs
 - ★ Spreadsheets show detailed information about the type and locations of PLC controllers and all I/O modules distributed on eight PLC chassis.
 - ★ Spreadsheets show for each module the channel description and the # of available channel spares.
 - ★ Documentation based on HMS PLC program, drawing will be required to verify channel description.
- Generated spreadsheet containing all vacuum-related tags in HMS PLC program.
 - ★ Existing vacuum monitoring for HMS magnets use two gauges:
 - Pirani gauge if vacuum is between 10^{-2} torr – 760 torr.
 - Penning (cold-cathode) gauge if vacuum is between 10^{-10} torr – 10^{-2} torr
- Researched Edwards vacuum gauge that will be added in HMS spectrometer vacuum controls.
 - ★ Edwards vacuum gauge measures vacuum from 7.5×10^{-10} torr – 750 torr.
 - Normal voltage signal from Edwards gauge is 2 – 10 V.
 - Gauge has built-in error reporting using voltages from 1 – 1.3 V.
 - ★ Output of Edwards gauge will go through signal conditioner to PLC analog input.
 - I/O chassis and analog input module are yet to be determined.
- Researched Hall C's UPS for UPS-to-PLC interface.
 - ★ Hall C uses an APC UPS model SMT1500RM2U.
 - ★ UPS has RJ-45 serial port on back to use with proprietary monitoring program.
 - ★ UPS can use expansion cards to give Modbus or relay interface.
 - ★ Contacted APC to request more information on built-in serial port, Modbus interface, and relay interface and whether either one could be used for monitoring the UPS via PLC.

RICH

- Reviewed RICH calibration data acquisition and analysis scripts
 - ★ Scripts measures dark-counts for each channel at different thresholds.
 - ★ Results from calibration give an indication of channel health over time when comparing results from different calibration runs.
 - ★ Procedure for calibrations located at https://clasweb.jlab.org/wiki/images/7/7a/Instructions_Pedestal-Dark.txt
- Update to add monitoring of standard deviation of averaged signals to hardware interlock program reverted due to increase in CPU usage.
 - ★ For EP cRIO, CPU usage doubled from ~20% to ~40%.
 - ★ Increase in CPU usage may be due to different subVI implemented to get standard deviation; further investigation underway.
- Debugged DAQ crate and power supply communication errors
 - ★ Turning DAQ crate and power supply on and then rebooting IOC resolved communication errors.
 - ★ Crates had been turned off during power outages in Hall B.
- Started and stopped air-cooling compressor.
 - ★ Compressor needed to allow powering of RICH electronics for calibrations.



Detector Support Group

Weekly Report, 2018-05-30

SVT

- Installed three 5V versions of PCB #2.
- Completed environmental sensors board modifications for patch panel.
- Began changes to SVT control monitoring code.
 - * Added enable/disable averaging and averaging samples arrays to front panel.
 - * Updated code to enable and average individual sensors for RTD temperatures, HFCB temperatures, coolant flow, and coolant temperature.
- Fabricating HTSB2 cables.
- Investigated dew point calculations and interlocks on SVT Hardware Interlock System.
 - * The hardware interlock system correctly uses the Magnus formula.
 - * To calculate the correct dew point, the RH must always be a positive number.
 - * At times, the sensors can show slightly negative values due to sensor inaccuracy and/or calibration.
 - * The lowest possible RH is limited to .01% for the dew point calculation.
 - * The system correctly shows the dew point temperature differential used for the interlocks.

DC

- Created histograms in Python for standard and mixed gases with bin width at 5mV.

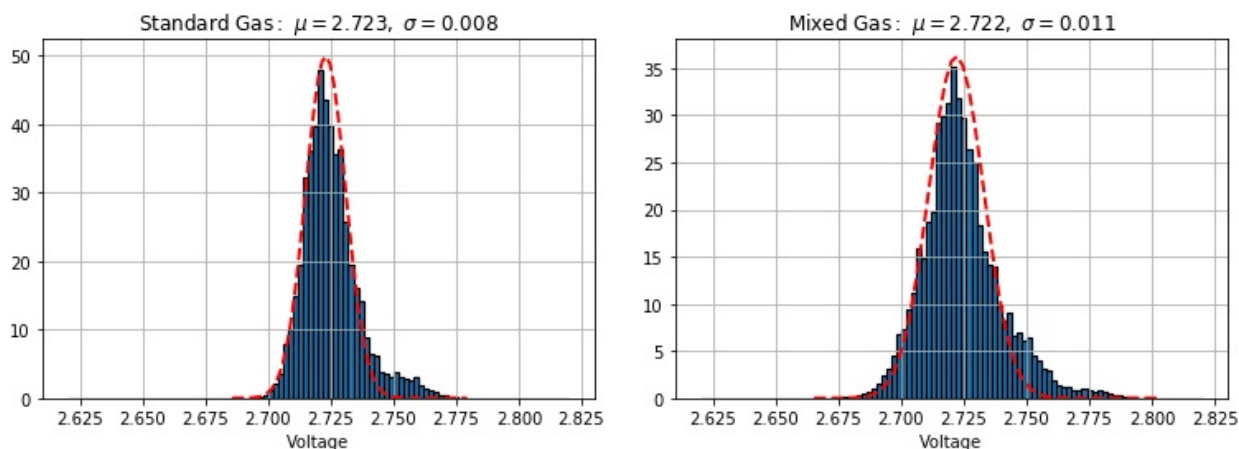


Figure shows the histograms for the data measured with DC TCU #1 for Standard and mixed gases

HDice

- Developed and tested NMR program initialization sub-routine.
 - * Operator must choose HDice magnet type and synchronized or asynchronous operation mode at program start.
 - * Option of using helium temperature and level sensors is given.
 - * Program displays all operator chosen values and gives the option of safely exiting before communicating with the instrumentation.
- Started setup and configuration of the HDicePC3 computer.
 - * This machine has been reformatted to Windows 7 and placed on the Hall B experimental sub-net.



Detector Support Group

Weekly Report, 2018-05-30

LTCC

- Added absolute pressure sensor and RTD temperature sensor to measure ambient conditions in ESB for Sector 1 leak test.
- Recovered 22.5 [Kg] gas (Mix gas: Air, Nitrogen, C₄F₁₀) for Sector 5.
- Leak test on Sector 1 continues.
 - * No gas has been supplied for at least one week, pressure remains between 2 and 3 [iwc].

Gas System

- Moved SFL3 back to clean power for extra outage to replace transformer.
- RTPC group received gas system parts and will start assembly at William and Mary.
- Updated RTPC gas supply P&I diagram.
 - * Added 2 manual valves, one for isolation of the MFC and 2nd gas supply.

Hall D

- Installing LabVIEW 2018 in preparation of updating PXI controller.



Detector Support Group

Weekly Report, 2018-05-30

Antonioli, Mary Ann

- Made Visio drawing of Hall C PLC network map.
- Began changes to SVT control monitoring code.
 - ★ Added enable/disable averaging and averaging samples arrays to front panel.
 - ★ Updated code to enable and average individual sensors for RTD temperatures, HFCB temperatures, coolant flow, and coolant temperature.
- Formatted Amanda's TCU note in InDesign and edited.

Bonneau, Peter

HDice

- Developed and tested NMR program initialization sub-routine.
 - ★ Operator must choose HDice magnet type and synchronized or asynchronous operation at program start.
 - ★ Option of using helium temperature and level sensors is given.
 - ★ Program initializes all values to safe levels.
 - ★ Program displays all operator chosen values and gives the option of safely exiting before communicating with the instrumentation.
- Started setup and configuration of the HDicePC3 computer. This machine has been reformatted to Windows 7 and placed on the Hall B experiential sub-net.

SVT

- Investigated dew point calculations and interlocks on SVT Hardware Interlock System.
 - ★ The hardware interlock system correctly uses the Magnus formula.
 - ★ To calculate the correct dew point, the RH must always be a positive number.
 - ★ At times, the sensors can show slightly negative values due to sensor inaccuracy and/or calibration.
 - ★ The lowest possible RH is limited to .01% for the dew point calculation.
 - ★ The system correctly shows the dew point temperature differential used for the interlocks.

Hall C

- Held daily status and planning meeting on HMS and SHMS PLC control systems.
 - ★ Work on communication with the network-based NMR is progressing.

Campero, Pablo

Hall C

- Acquired two RS-Logix5000 licenses Full edition
 - ★ Generated CCPR to run licenses on Computer Center server.
 - ★ Server computer will be supported by computer center
 - ★ Requested limited access for users to use the licenses.
- Worked on NRM PT2026 Tesla Meter communication with PLC task.
 - ★ Debugged Ethernet communication with PT2026 Tesla Meter.



Detector Support Group

Weekly Report, 2018-05-30

- Configured DNS and Domain to set up PT2026 Tesla Meter in the Hall C Dev subnet.
- Created Ethernet VISA TCP/IP resources to connect PT2026 Tesla Meter via its Ethernet port.
- Tested LabVIEW Ethernet communication with LabVIEW drivers.
- Tested Ethernet communications by sending SCPI commands, verified proper responses.
- ★ Upgraded firmware for 490 NBX modules to its version s19.
- ★ Configure and connected 490 NBX modules to talk with DSG-PLC and PT2026 Tesla Meter.
 - Configured TCP Port number and IP address.
 - Connected 490 NBX modules with PT2026 Tesla Meter.
 - Found issues to send commands and readout responses from the PT2026.
- ★ Assigned new IP address for the 1756-L72 Control Logix PLC (dsg-plc) to connect with Hall C Dev Subnet.
 - Dsg-PLC is intended to be use for the NMR communication test.
 - Configured and updated firmware for 1756 –EN2T module.
 - Configured Ethernet/IP drivers on RS-Link Classis to communicate PLC in Hall C Dev Subnet.
- ★ Wrote PLC test program to send and receive command from PT2026 Tesla Meter through 490NBX module.
 - Test program send commands to 490 NBX modules without problem.
 - Debugging read data from the PT2026 Tesla Meter.
- Generated first version of PLC layouts spreadsheet for HMS PLCs
 - ★ Spreadsheets show detailed information about the type and locations of PLC controllers and all I/O modules distributed on eight PLC chassis.
 - ★ Each module has a channel description and channel spares available.
 - ★ Documentation based on HMS PLC program, drawing will be required to verify channel description.
- Generated Networking spreadsheet for Hall C PLCs and devices connected to the Hall C and Hall C Dev Subnet.
 - ★ Spreadsheet contains information about the IP address, MAC address, serial numbers, Host names and physical locations of each PLC and devices.
- Wrote Hall C weekly report to inform current status for hall C task performed by DSG.

RICH

- With Tyler turned compressor on to enable calibration of the RICH.
 - ★ Opened valves related in the Air panel located at forward carriage 3th level.
 - ★ Monitored normal parameter after compressors was turned on.
 - Fond bad readout for output pressure signal at the air tank (negative readout).
- Took Oxygen Deficient Hazard training.
- Edited and reformat DSG weekly report for the week of 5/23/2018.
- Installed LabVIEW 2017 on dsg-hallc-2 computer.

Eng. Brian

SVT

- Installed three +5V versions of PCB #2.

LTCC

- Added absolute pressure sensor and RTD temperature sensor to measure ambient conditions in ESB for S1 leak test

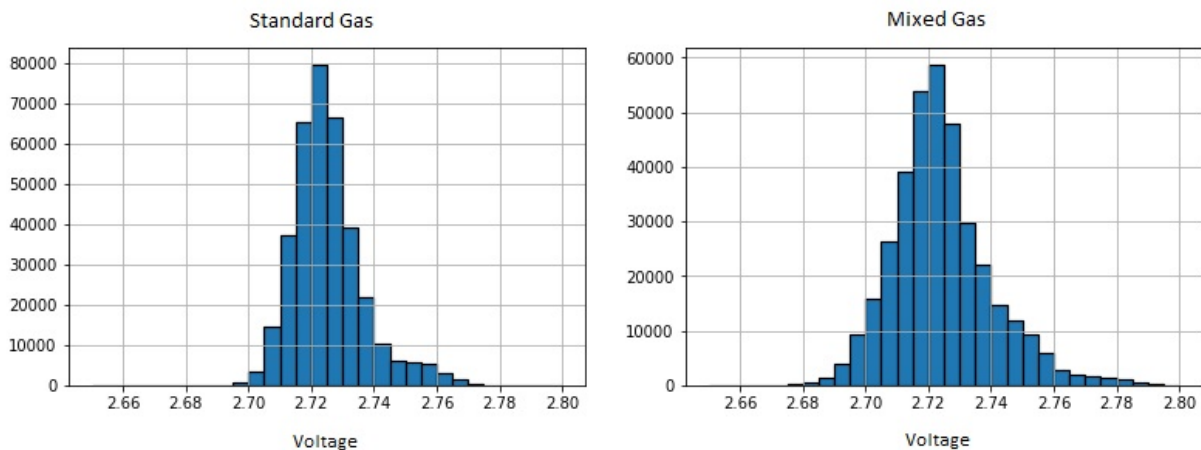
Gas System

- Moved SFL3 back to clean power for extra outage to replace transformer
- Installing LabVIEW 2018 in preparation of updating PXI controller in Hall D.

Hoebel, Amanda

DC

- Created histograms in Python for standard and mixed gases with bin width at 5mV.



Hall C

- Created list of PLC signals for 6 chassis.

Jacobs, George

- Attended to RTPC meeting.
 - ★ DMS – Drift Monitoring System uses Sr90 source.
- Updated RTPC gas supply P&I diagram – added 2 manual valves, one for isolation of the MFC and the other as a 2nd gas supply
- Ordered adapter fittings for the ppm H2O sensors

Leffel, Mindy

SVT

- For the HTSB2 cables:



Detector Support Group

Weekly Report, 2018-05-30

- * Tinned remaining six of 12 boards.
- * Stripped cable jackets and insulation.
- * Tinned, twisted, and trimmed wires.
- * Soldered cables to six remaining boards.

Lemon, Tyler

Hall C

- Installed RSLogix 5000 software on PC “dsg-hallc-5”.
- Updated HMS networking map to include vacuum system.
- Generated spreadsheet containing all vacuum-related tags in HMS PLC program.
 - * Existing vacuum monitoring for HMS magnets use two gauges:
 - Pirani gauge if vacuum is between 10^{-2} torr – 760 torr.
 - Penning (cold-cathode) gauge if vacuum is between 10^{-10} torr – 10^{-2} torr
- Researched Edwards vacuum gauge that will be added in HMS spectrometer vacuum controls task.
 - * Edwards vacuum gauge measures vacuum from 7.5×10^{-10} torr – 750 torr.
 - Normal voltage signal from Edwards gauge is 2 – 10 V.
 - Gauge has built-in error reporting using voltages from 1 – 1.3 V.
 - * Output of Edwards gauge will go through signal conditioner to PLC analog input.
 - Which I/O chassis and analog input module has yet to be determined.
- Researched Hall C’s UPS for UPS-to-PLC interface task.
 - * Hall C uses an APC UPS model SMT1500RM2U.
 - * UPS has RJ-45 serial port on back to use with proprietary monitoring program.
 - * UPS can use expansion cards to give Modbus or relay interface.
 - * Contacted APC to request more information on built-in serial port, Modbus interface, and relay interface and whether any could be used for monitoring the UPS via PLC.
- Discussed DSG’s tasklist with Peter, Pablo, and Amanda.

RICH

- Update to add monitoring of standard deviation of averaged signals to hardware interlock program reverted due to increase in CPU usage.
 - * For EP cRIO, CPU usage doubled from ~20% to ~40%.
 - * Increase in CPU usage may be due to different subVI implemented to get standard deviation; further investigation underway.
- Started and stopped air-cooling compressor with Pablo and Amanda.
 - * Compressor needed to allow powering of RICH electronics for calibrations.
- Debugged DAQ crate and power supply communication errors with Marco Mirazita.
 - * Turning DAQ crate and power supply on and then rebooting IOC resolved communication errors.
 - * Crates had been turned off during power outages in Hall B.
- Reviewed RICH calibration data acquisition and analysis scripts with Marco Mirazita.
 - * Scripts measures dark-counts for each channel at different thresholds.
 - * Results from calibration give an indicator of channel health over time when comparing results from different calibration runs.



Detector Support Group

Weekly Report, 2018-05-30

- ★ Procedure for calibrations located at https://clasweb.jlab.org/wiki/images/7/7a/Instructions_Pedestal-Dark.txt

- Installed LabVIEW 2017 on PCs “dsgcontrols1” and “prbdsplt2”.

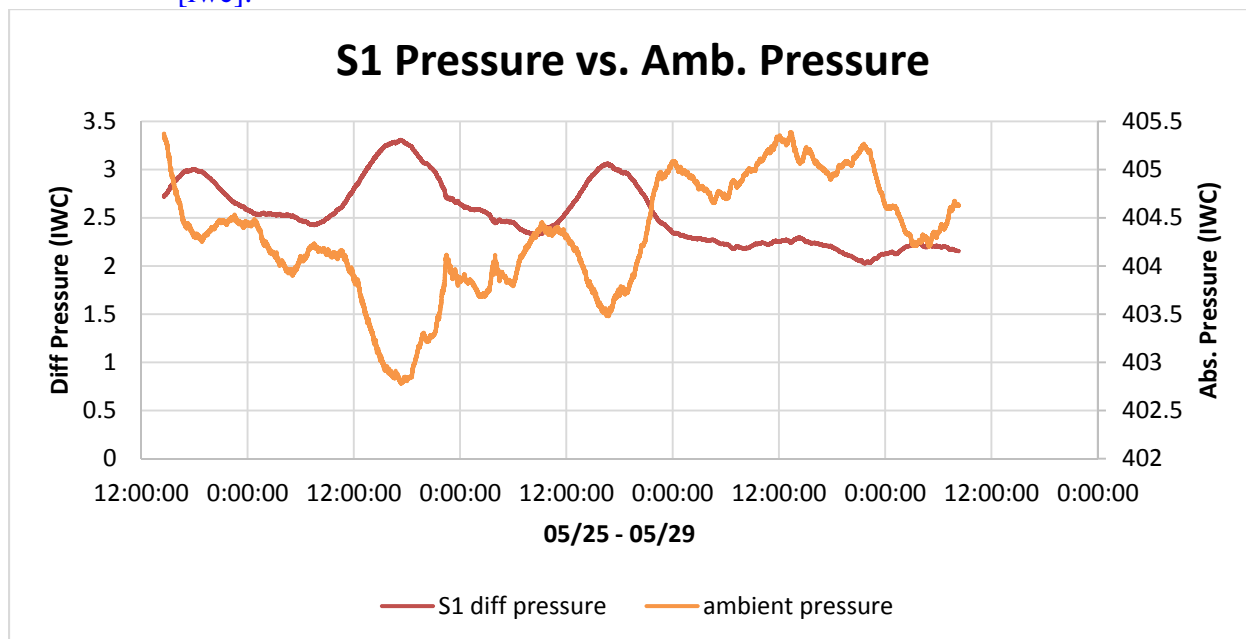
McMullen, Marc

SVT

- Completed environmental breakout for patch panel. Will start modification to adapt old SVT cabling to fit the new connectors

LTCC

- 22.5 [Kg] of C₄F₁₀ gas recovered for Sector 5.
- Leak test on Sector 1 continues.
 - ★ Currently the pressure is cycling opposite of the atmosphere, without gas loss thru the bubbler, due to the oil level.
 - ★ No gas has been supplied for at least one week, pressure remains between 2 and 3 [iwc].



Plot shows the relation between Differential Pressure and Atmosphere pressure.

RTPC

- Attended meeting to discuss the project status.
 - ★ RTPC group received parts and will start assembly at William and Mary.
 - ★ RTPC group will request assistance from the DSG as needed.
 - ★ George is working on a modification of the current P&I diagram.