



Detector Support Group

Weekly Report, 2019-02-13

Summary

Hall C EPICS

- EPICS alarm handling using a self-developed program (LabVIEW, Python) investigated.
 - ★ A pre-made alarm-handler (ALH, BEAST) would be best because using self-developed program would require additional Boolean PVs that act as alarm indicators.
- Alarm indication investigated in WEDM.
 - ★ If alarm fields (limits, severities) are provided for PV, WEDM text indicators can be configured to change color of text and add a border around indicator to indicate alarm status.
 - ★ Currently, no PVs from PLCs are utilizing alarm fields.
- Program developed to write alarm fields to PVs.
 - ★ Program reads in table of PVs and fields (in Excel, CSV, or tabulated format) and writes values to the appropriate fields.
 - ★ If acceptable, program could be used to write alarm limits and severities to PVs from PLCs to enable alarms to be displayed on WEDM.
 - ★ Program developed and tested using PVs on test IOC running on *dsg-c-linux1*.
- Spreadsheets generated for HMS/SHMS HV and PLC PVs and fields Alarms.
 - ★ Spreadsheets contain limits, status and severity values for each PV alarm field.
 - ★ *HallC.ahlConfig*, *ALH-default.ahlAlarm* and *ALH-default.ahlConfig-example* files analyzed.
 - ★ Found that current alarm handler for Hall C HMS and SHMS have an extra PV, which is used to alarm when is out of its limits.
 - SHMS HV PV alarms: 385; HMS HV PV alarms: 186
 - SHMS/HMS PLC PV alarms: 89

HDice

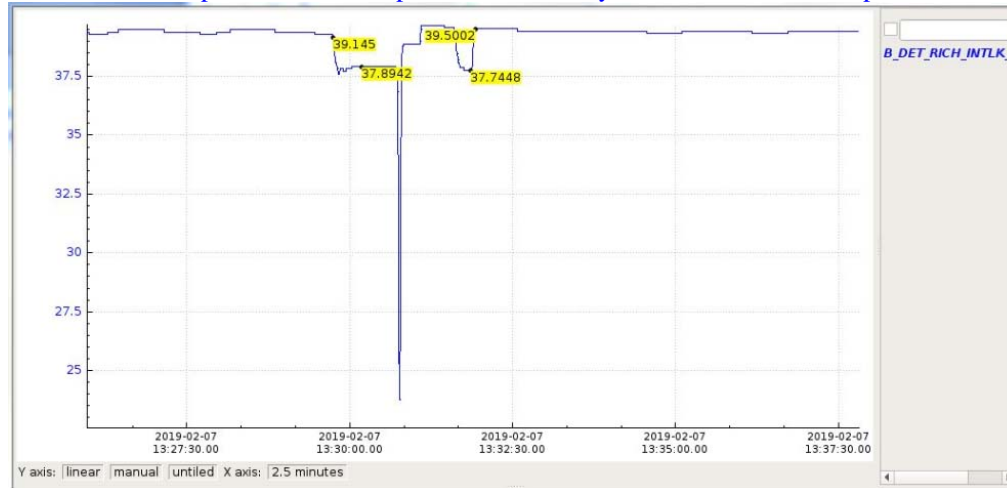
- Test on NMR Rack #1 performed to investigate source of cycle timing difference between NMR LabVIEW program running in Windows 10 and Windows 7.
 - ★ NMR configuration tables used in LabVIEW program verified to be same for Windows 7 and 10.
 - ★ Individual NMR LabVIEW program sections timed for each cycle.
 - Additional extra 25s found when program ran in windows 10 PC.
 - Extra time noticed during lock-in amp buffer dump; this points to GPIB issue.
 - ★ Newer GPIB-USB (model: HS+) used to connect lock-in amplifier with windows 10 PC.
 - ★ GPIB and RS232/485 configurations verified: Same for both PCs.
 - ★ Different GPIB configurations tested for the bus timing; found same timing execution for program.
 - ★ CPU usage checked while running program.
 - Both Win10 and Win7 had ~15% CPU usage during cycles.
 - ★ Program and background applications used ~4GB of RAM on both CPUs.
 - ★ Timing problem still persists.

LTCC

- Testing newly installed H₂O sensor.
 - ★ Initial indications shown from 500 to > 3000 ppm of moisture during the return cycles of the C₄F₁₀ from the hall
 - ★ H₂O sensor readout goes off scale when the pumps flow and doesn't seem to make sense; more data needed to get a better idea of performance.
 - ★ Already contacted vendor to see if they have any additional information.
- Noticed that S3 and S5 are still only filled with C₄F₁₀ during the day shift, due to the work needed on the transfer line heat tape.
- Code modifications continued to update set points via auto-updating configuration file
 - ★ Code will replace the hard coded values for each set point, which will allow the set points to be updated as they are changed on the GUI.

RICH

- *d0* program executables replicated, program is used to measure spherical mirrors' radius of curvature in Python and LabVIEW.
 - ★ Previous test required two PC: Debian Linux PC to run *d0* test executables and a Windows PC to control linear stages on CCD stand.
 - ★ Re-development of *d0* executables to be able to run on Windows would allow all test software to be run from one PC.
- N2 flow to RICH using backup manifold and N2 banks measured to be ~37 slm.
 - ★ Flow measured by turning off N2 supply to RICH from main Hall B N2 dewar
 - ★ Verified that pneumatic valve opened automatically to flow N2 from backup banks.



RICH N2 Flow 1 during measurement of backup manifold flow rate.

The large drop to ~25 slm was the complete shutoff of all N2 to RICH to verify correct flow meter operation since the high backup supply flow was unexpected.

Magnets

- FPGA to Linux example code setup investigated for possible Low Voltage chassis replacement.
 - ★ Examples pre-compiled seem to work fine but re-compiling doesn't work.
 - ★ Old versions of toolkits will be used to see if that makes any difference.

RTPC

- Meeting held with RTPC group to discuss scope of DSG work and timeline about detector gas, as well as possible target gas controls.
 - ★ RTPC group sent a schedule which includes dates for testing in the EEL and installation in the hall.
 - ★ More information is expected on the gas supply needs for the target.

cRIO test station

- For NI 9263 module test:
 - ★ Time delay in taking samples with Keithley tested. Reduced from 500 ms to 25 ms.
 - ★ LabVIEW code completed to test differential non-linearity, dynamic range, gain error, integral nonlinearity, and offset error.
 - ★ Manual mode tests completed.



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PLC Test Station

- For PLC Test Station proposal:
 - ★ Updated PLC controllers and Modules Summary tables.
 - ★ Added description of planed tests for each PLC module based in their type.
- Assigned IP address to *dsg-plc-135* PLC via RS-232 serial port, since Ethernet communication had connection problems.
- Installation of Rockwell Software on *DSG-COMP2* PC is in progress.
 - ★ Debugging *.Net Framework 3.5* installation, required in PC previously, for RS-Logix5000 installation.
 - ★ Installation completed after Computer Center approved the permissions.
- Development of **Digital High-Accuracy Temperature and Humidity Monitoring** for slow-controls systems
 - ★ FPGA device driver library for new SHT85 sensor is under development.

DSG Website

- *Testing of Hall C's PT2026 NMR Unit* note posted.
- Main *DSG* website photo changed.
- *RTPC* meeting minutes posted to web, along with various other meeting minutes and technical documents.
- Technical documentation completed for infrastructure on “O” drive and on the website. Checked all page links.