Detector Support Group

Weekly Report, 2016-03-23

Ongoing Projects

I. Hall B **Magnet Slow Controls** (Brian, Peter, Tyler, Amanda)

Task:	Test Power supply PLC to EPICS interface.
EDC:	3/15/2016
Work done:	Testing MPS EPICS screens.
Comments:	Changed baud rate of MPS control board from 9600 [baud] to 115200 [baud] to solve communication issues, i.e. tag glitches (show up as ?$07), between MPS control board and NBX module; *switching baud rate did not solve issue. Issue is with PLC program.* Spied on the communication between MPS control board and NBX module; i.e. captured serial output with spy cable; confirmed *problem is with serial lines*. Partial command is sent after previous successful one is sent, so MPS replies back with an invalid command received, causing all EPICS indicators, e.g. current, current set point, and slew rate, to flash zeros. Continued testing CSS screen; power on/off button displays status properly now, number changes respond first time, local/remote works as well. Switched PLC code to use *DA 4* for slew rate instead of *DA 1* (12-bit vs. 8-bit).
Status:	**Delayed.**

II. Hall B **Gas System Slow Controls** (Brian, Marc, George, Mary Ann,)

Task:	Deploy LabVIEW based slow controls software system for **DC, LTCC, HTCC, SVT, Micromegas, Forward Tagger,** and **RICH**.
EDC:	07/31/2016.
Work done:	Coding DC Ar/CO_2 mix ratio.
Comments:	Ar/CO_2 mix has two modes. CO_2 following mode: Ar flow and percentage is selected, CO_2 level is automatically determined. Manual CO_2 mode: CO_2 flow and percentage is selected, Ar level is calculated.
Status:	**Work in progress.**

III. Hall B **Gas System DC Hardware in hall** (George, Marc, Mindy, Sahin, Anatoly)

Task:	Install Gas System hardware.
EDC:	N/A (Depends on HallB Engineering)
Work done:	**No Activity**
Comments:	Four of the existing DC pumps have failed. DCGAS needs 6 new pumps ($18,000), two are to be spares. DSG recommends phased procurement, starting March 2016 two pumps every four months.
Status:	**Work in progress.**

IV. Hall B **Gas System LTCC Hardware in hall** (George, Marc, Mindy, Sahin,Anatoly)

Task:	Install Gas System hardware.
EDC:	N/A (Depends on HallB Engineering)
Work done:	Chassis set-up in rack. For all sectors, supply lines for C_4F_{10} and lines from six Magnahelics to the six bubblers installed.
Comments:	Solenoid and network cables being fabricated. Power outlet available. Received switch from Computer Center.
Status:	**Work in progress.**

V. Hall B **Gas System MVT Hardware in EEL (**George, Marc, Mindy,Sahin, Anatoly)

Task:	Design sytem for EEL tests.
EDC:	07/31/2016
Work done:	Design generated.
Comments:	Installation date scheduled for mid July 2016.
Status:	**Completed.**

VI. Hall B **Gas System HTCC in TEDF (**Brian, Marc, George, Mindy, Sahin,Anatoly)

Task:	Replace cRIO.
EDC:	N/A.
Work done:	cRIO replaced and hooked up to network.
Comments:	Gas system design changed: *no PID pressure control, no O_2 sensor, no solenoid valves.*
Status:	**Completed.**

VII. Hall B **HDICE (**Mary Ann, Peter, Amanda, Tyler, Mindy, Sahin)

Task:	Fabricate RF box. Task includes draw fabrication drawing in AutoCAD, write drivers for DIO modules, and develop RF box test program review.
EDC:	N/A.
Work done:	Nineteen drivers coded. AutoCAD drawing of front and back panels and panels sent to Cardinal Machines for machining; expected back by 04/06/2015.
Comments:	None.
Status:	**Work in progress.**

VIII. Hall B **HDICE (**Peter, Amanda, Tyler, Mary Ann, Mindy, Sahin)

Task:	Develop calibration test program for the CAEN current transducer box. 1. Develop and test instrument drivers.
EDC:	N/A.
Work done:	Testing drivers for Krohn-Hite current source and Fluke amplifier.
Comments:	None.
Status:	**Work in progress.**

IX. Hall B **HTCC** (Mary Ann, Mindy, Anatoly, Sahin)

Task:	Fabricate LV compensation coil cables.
EDC:	07/31/2016
Work done:	Completed terminating all cables.
Comments:	**Congrats! great work.**
Status:	**Completed before schedule.**

X. Hall B **RICH** (Tyler, Amanda, Peter, Brian, Mary Ann, George, Mindy, Sahin, Marc, Anatoly)

Task:	Discuss test procedures.
EDC:	N/A.
Work done:	Sent clean room drawing to Marco & Marco.
Comments:	Received report from Marco & Marco regarding test procedures.
Status:	**Work in progress.**

XI. Hall D **PLC Systems** (Pablo, Peter, Brian, Tyler, Amanda, Mary Ann, Marc)

Task:	Locate and document (including spares) the eight PLC systems in use.
EDC:	03/15/2016
Work done:	**No Activity.**
Comments:	Report due April 6. Need verified spares list of PLC components
Status:	**Delayed.**

XII. Hall B **SVT Long Term Test** (Amanda)

Task:	Monitor long term test of the eight modules.
EDC:	End of July 2016
Work done:	Analyzed module currents. Currents are stabilizing.
Comments:	For details, see Amanda's section in the weekly report. Write-up due March 30, 2016.
Status:	**Completed.**

XIII. Hall B **SVT Long Term Test** (Amanda)

Task:	SQLite databasing of Hall D solenoid voltage taps.
EDC:	End of July 2016
Work done:	Database voltage tap readings from solenoid.
Comments:	None.
Status:	**Work in progress.**

Antonioli, Mary Ann

Hall B

HDice

- Wrote, this week, LabVIEW code for twelve drivers for the DIO modules of the RF/Attenuation box, in all, so far, 19 drivers have been coded.
  - ✶ New assessment indicates that 8 more drivers are needed.
- Made edits to AutoCAD drawing of front and back panels for box, to prepare for machining.

HTCC

- For the compensation coils low voltage cables, seven of eight are fabricated by Mindy, as far as possible. HTCC group will be completing cables with second connector.

Arslan, Sahin

Hall B

LTCC

Worked with Anatoly

- Installed MFC chassis in new control rack on forward carriage, L1.
- Removed detector supply and return line that were previously run from L4.
- Disconnected existing C_4F_{10} supply and return lines.
- Re- route C_4F_{10} gas supply 1" black tubing, N_2 gas supply along the downstream end of forward carriage to LTCC valve panel, secured with cush clamps.
- Run a ¼ "gas lines from pressure protection bubblers to control rack and attached to pressure control Magnahelics S1, S2, S3, S4, S5, S6, labeled all the lines.
- Adjusted S2 bubbler oil level.

DC

- Replaced Ar/CO_2 gas on R1S4 currently being tested.
- Provide N_2 gas bottle for SVT.

HDICE

- Working on RF box shelf for fabrication.

Hall B Magnet

- Fabricated 3 way serial spy cable (This cables is used for to see communication between PLC and magnet power supply.

Bonneau, Peter

Hall B

SVT

- Monitored SVT Hardware Interlock System on a daily basis.
  - ✶ System successfully reset after the IP address for the Accelerator subnet were updated.

Magnets

- Josh is working on the Torus Service Tower PLC testing. Will ask DSG for help if needed.

HDICE

RF Switching/Attenuation Unit

- Reviewing LabVIEW hardware test program.
  - Test program fails intermittently on display test.
  - Program does not adequately check switch readbacks or cable type and termination connectors.
- Developing detailed project tasks for DSG work on HDICE.
- Working with Tyler and Amanda on the development of NI-VISA device drivers for the CT-Box calibration program.
- Working with Mary Ann on the development of device drivers for the ICP CON DAq modules.

Hall D

- Monitored Hall D slow control systems on a daily basis.
  - For the FDC, a FA125 ADC Module was replaced when bit errors were observed.

DSG

- Reviewed with Pablo Hall D PLC system report and configuration files.
- Added Pablo to the dsggrp and dsgslowc group accounts to allow access to DSG and DSG_Slow_Controls directories on the shared "M" drive.

Campero, Pablo

Hall B

SVT

- Attended SVT meeting.
  - Discussion on leakage currents of R1S7B, R1S8B.
  - Discussion on comparing and analyzing geometry of the SVT.

Hall D

Slow Controls

- Attended meeting.
  - Discussion topics: solenoid and fan replacement.

DSG

- Toured Hall B
  - Introduced to control-room of valves to gases, in gas shed.
  - Introduction to system and devices inside the area.
- Radiation Worker I Training
  - Passed test.
  - Received dosimeter.
- ODH Oxygen Deficiency Hazard Training.
  - Completed course and test.
- Discussed with Peter Hall D PLC.

- Familiarized myself with PLC control systems and control areas at JLAB.
- Reviewed PLC layouts and PLC system reports.

Eng, Brian

Hall B

Gas System

- Investigated HTCC gas system reporting "no flow".
  - Re-zeroing MFCs after closing N_2 supply fixed issue.

Magnets

- Tried changing baud rate from 9600 [baud] to 115200 [baud] to see tag glitches (show up as ?$07) are fixed, no difference. Captured serial output with spy cable Sahin made, confirmed it is an actual problem with serial lines. Partial command is sent after previous successful one is sent, so MPS replies back with an invalid command.
- Continued testing CSS screen; power on/off button displays status properly now, number changes respond first time, local/remote works as well.
- Switched PLC code to use DA 4 for slew rate instead of DA 1 (12-bit vs 8-bit).

SVT

- Set up function generator to use as a random trigger in order to get an increased trigger rate to find out when DAQ breaks, simply lowering the thresholds holds the trigger high.

Hoebel, Amanda

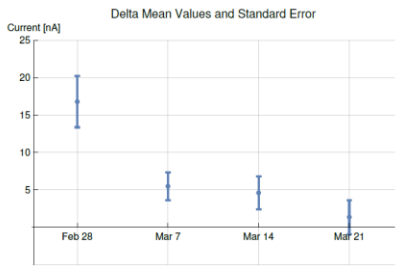
Hall B

HDICE

- Sequenced VIs for Fluke Transconductance Amplifier 52120A.
  - Setting output terminal and current ranges done in the same VI.

SVT

- Attended SVT meeting.
  - Discussion on attempt to fix reconstruction misalignment using "closest approach" with Millipede.
- Monitored change in current for spare modules.
  - Calculated average mean and standard error for change in currents (<ΔI>) for 1 week prior to listed date minus the week before (ex: Feb 28 is week of Feb 22 minus week of Feb 15). Current is stable see graph below.



<ΔI> vs. time

Hall D

Detector

- Monitored logbook.
  - ✶ DAq crashed with warning “buffer size exceeded.”
- Attended Slow Controls meeting.
  - ✶ Discussed fixing fan for VME crate.
  - ✶ Hovanes suggested that I create template for the solenoid voltage tap database.
- Created SQLite database for voltage tap measurements.
  - ✶ Utilized Excel-to-SQLite program from Github to create and query databases.

DSG

- Assisted Pablo with setting up accounts, obtaining supplies, monitoring logbook, and completing required training.

Jacobs, George

Hall B

Gas Systems

LTCC

- Supervised installation of final 3 LTCC detector box gas lines, 6 pressure transducer lines, and North side bubblers.
- Prepping for leak checks using R134a gas.
  - ✶ Pressure control tank installation must wait until the forward carriage is moved upstream.
  - ✶ Final gas lines and controls can be installed once the tank is in correct location.
- Modified LTCC gas line connections at the valve panel to eliminate tubing deformation. due to excessive bend radius.
- Ran C_4F_{10} and N_2 supply lines to LTCC valve panel.

HTCC

- Meeting with Youri Sharabian about HTCC gas supply requirements.
  - ✶ HTCC has had gas flow for several months using a bubbler to limit pressure without issues, no PID is required.
- Adding absolute Baratron to monitor atmospheric pressure vs. box pressure.
  - ✶ Plan to have CO_2 dewar in hall for temporary HTCC gas supply until permanent gas lines are ready.
  - ✶ HTCC nominal pressure is 0.140 [inwc]
- Ordered nylon tubing ferrules for various gas system assemblies
- Produced major revision of HTCC controls and piping diagram.
- Produced major revision of HTCC gas system scope of work

RICH

- Received class 0 compressor quote from Ingersol Rand, no quote from Kaeser

Micromegas

- Produced cost estimate for micromegas five-gas mixing system.
- Produced final gas mixing diagram for MVT assembly and commissioning in EEL

- Added diagram to HBList
- Fabricated MFC+Mixing volume and argon pressure regulator+relief valve component assemblies for MVT gas mixing setup for EEL
  - ✶ Need cables for MFCs to MKS647
  - ✶ Ready to install component assemblies in EEL Rm.124.

Leffel, Mindy

Hall B

Forward Tagger (INFN)

- Repaired two cables.
  - ✶ Rewired a six contact Molex connector.
  - ✶ Rewired a 37 contact D-sub connector.

HTCC

- Terminated 9 of 10 compensation coil cables.

LTCC

- Terminated 6 of 6 network cables.

DSG

Safety

- Reported smoking related issues, to be discussed at the next worker safety committee meeting.

Lemon, Tyler

Hall B

Magnet

- Tested with Brian MPS EPICS screens.
- Changed baud rate of MPS control board from 9600 [baud] to 115200 [baud] in attempt to solve communication issues between MPS control board and NBX module; did not solve issue.
- Spied on the communication between MPS control board and NBX module; noted the NBX module responded with an error to some commands causing all EPICS indicators, e.g. current, current set point, slew rate, to flash zeros.
- Noted that polarity status, MPS power status, and Remote/Local control were fixed.

HDICE

- Wrote application for Krohn-Hite Model 523 drivers.
  - ✶ Application uses drivers to set all parameters for Model 523.
  - ✶ Compares response from settings query to input from controls.
  - ✶ Produces error indicators if control values and setting query results do not match.

Software

- Attended meeting.
  Discussion for DC:
  - ✶ Trying to improve tracking with FPGAs on the drift chamber readout boards.

Discussion on SVT:

- Results of the simulations with vertical tracks and 0 [T] field.

SVT

- Attended meeting.
  - Discussed results from new alignment using Millepede

Hall D

Slow Controls

- Attended meeting.
  - Discussed fan replacement in VME FCAL 8 and the status of EPICS screens to control the motors for the microscope.

Detector

- Monitored logbook with Amanda, Pablo, and Peter.
  - Noted on 03/17/16 that FDC high voltages have been turned down due to the pressure differential across MFC dropping, caused gas to be Argon rich; FDC HV set to 2000 [V].
  - Noted on 3/22 that FDC has been reset since pressure differential had been resolved
- Monitored EPICS with Amanda, Amrit, Pablo, and Peter.
  - Viewed solenoid cryo screen, noted tank level indicator on liquid helium tank was still broken
  - Viewed voltage tap screen, attempted to compare location of voltage taps on EPICS screen to another diagram, unable to because the two images had different locations and naming for the voltage taps.

McMullen, Marc

Hall B

Gas System

DC

- Coded DC mix gas controls.
  - Ar/CO_2 mix has two modes.
    - CO_2 following mode: Ar flow in liter per minute and desired Ar% of mixture is set. CO_2 setpoint is automatically determined.
    - Manual CO_2 mode: CO_2 flow in liter per minute is entered, Ar setpoint is automatically determined.
- Met with HTCC project lead, Youri Sharabian and George Jacobs.
  - Discussed need for a PID loop.
  - Determined system could be a purged with high and low flow rate set points for the MFC.
- Installed MKS 626A absolute pressure transducer in HTCC test setup.
  - Fabricated power/signal cable assembly to add transducer to the existing set up.
  - Coded ambient pressure into monitoring program.
- Attended Hall B Engineering meeting. Topics covered:
  - Upcoming PRad change over from HPS (2 weeks estimated.)

- Ongoing LTCC installation, 6 sectors installed, 2 cabled.
- DSG staff slated to perform system leak check.
- DC cable tray installation will begin when manpower is available.
- Installation of new flood gates will be coordinated with 12GeV install time.

LTCC

- Control chassis moved to Hall B.
- Terminated 12 solenoid end connections.
  - Working with Mindy Leffel on solenoid cables.
- Network switch is installed.
  - Leffel terminated new network cables for MFCs.
- Continued writing code for LTCC gas controls.

Sitnikov, Anatoly

Hall B

Gas System

- Sahin and I installed MFC chassis in new control rack at forward carriage LV1.
- Removed detector supply and return line that were previously run from L4.
- Disconnected exsisting C_4F_{10} supply and return lines.
- Rerouted C_4F_{10} gas supply 1" black tubing #2 gas supply along the downstream end of forward carriage to LTCC value panel, secured with cush clamps.
- Ran a 1/4" gas lines from pressure protection bubblers to control rack and attached to pressure control Magnahelics S1-S6.
  - Labeled all the lines.
  - Adjusted S2 bubbler oil level.
- Changed Ar/CO_2 gas cylinder on R1S4.
- Provided gas cylinder for SVT