



Detector Support Group

Weekly Report, 2016-10-19

Ongoing Projects

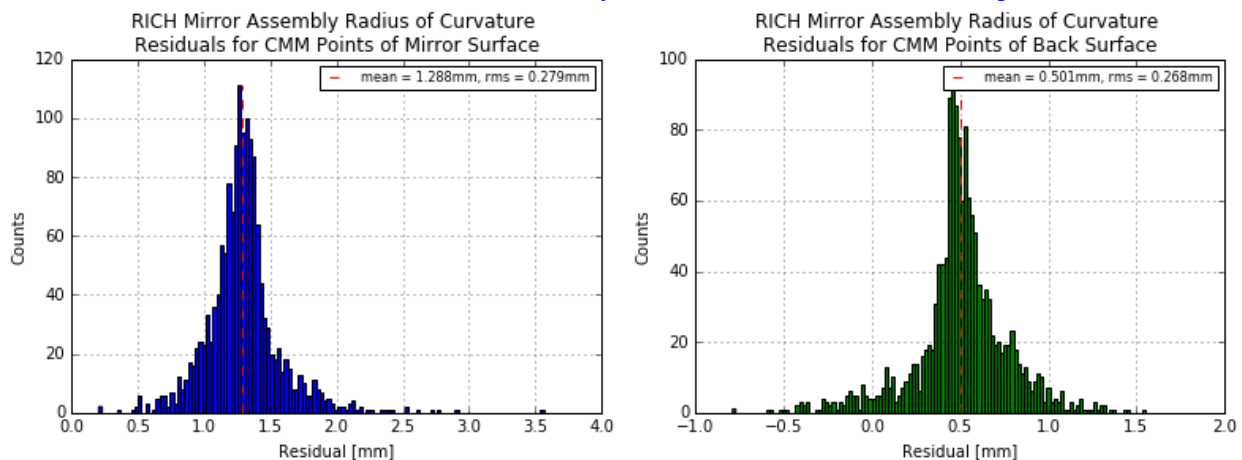
Magnet Control System

Torus

- Researched touch panels screens used for Cryo Distribution Box and Torus controls.
- Developed network and communication map for Torus control systems.
- Completed first pass of conversion to 2016 for LV chassis cRIO, still waiting on Ethernet/IP toolkit before saving as 2014 version.
- Installed NTP on Torus LV cRIO to keep its time in sync with other devices.
- Fixed cernox issues by removing power dissipation from decision logic to set excitation current. Current now properly increases and decreases to get target dissipations based on temperature.
- Initial pass of magnet commissioning complete (to 350 A).

RICH

- Repeated $d\theta$ measurement with fit procedure for mirrors 1 and 4.
- Imaged mirror 1 and 4 using Shack-Hartmann sensor.
- Calculated residuals for mirror assembly radius of curvature (see histograms below).



Histograms of RICH mirror assembly radius residual calculations. Left histogram is for mirror surface; right histogram, back surface.

SVT

- Installed faraday cage over R3.
- Continued cabling R2 and R3 for testing.
 - ★ Attached cable bundles with strain relief.
- Debugged R3 modules (S3 and S4).
 - ★ S3 had damaged LV connector on L1C end. S4 had slow controls cable issue (no bottom temp, but cable/connector looked fine).
- Performed gain scans on modules.
- Backed up gain scan data files off clonfs mount due to work drive running out of space again. Still need to decide what to do with gain scan images.

FT

- Developed system channel architecture and cRIO module assignments for hardware interlock system.
- Current loop interface was chosen for chiller interface.

Detector Support Group Weekly Report, 2016-10-19

- cRIO processor and instrumentation modules from INFN are in Richmond and awaiting customs clearance.

HDice

- Hooked up instrumentation equipment in Controls Rack 2



HDice Controls Rack 2



Detector Support Group

Weekly Report, 2016-10-19

Antonioli, Mary Ann

- Assisted Tyler in testing of RICH mirrors.
- Continued updating HDice RF Attenuation/Switching Unit test, “cleaning up” code and working on ability to choose one or more tests.
- Drew HDice controls rack in Visio.
- Refined Torus Visio drawing.

Arslan, Sahin

SVT

- Installed faraday cage over R3.
- Continued cabling R2 and R3 for testing. Attached cable bundles with strain relief.
- Replaced damaged connector on LIC side of R3S3 LV cable.



Damaged connector

- With Mindy, moved equipment to HDice lab for installation in controls rack.

Bonneau, Peter

Magnet Systems

- Working with Pablo on troubleshooting Torus magnet programming and instrumentation.
 - ★ Investigated conditions that cause PLC-controlled ramp down and fast dumps.
 - ★ Examining code handling of loss of comms.
 - ★ Analyzing and documenting LV sensors and signal processing.
 - ★ Reviewed Cernox specifications and programming.
- Monitored Torus instrumentation and cryogenic system status via EPICS, during low current testing.
 - ★ MPS ZFCT current readback is unstable. Readback varies ~10 A to -10 A while MPS is turned off.
 - ★ Hall sensors for coils C, D, and F are not 0.00 A when MPS is off.

Forward Tagger

- Developed system channel architecture and cRIO module assignments for hardware interlock system.
- Current loop interface was chosen for chiller interface.
- cRIO processor and instrumentation modules from INFN are in Richmond and awaiting customs clearance.

HDice

- Worked with Amanda /Mindy /Sahin on installation of NMR instrumentation in HDice lab.



Detector Support Group

Weekly Report, 2016-10-19

- ★ Testing and debugging are underway.
- Worked with Amanda on IBC pump cart cRIO processor replacement and software upgrade.
 - ★ Investigated and documented comm ports for instrumentation and cRIO module signals, in preparation of CALab EPICS interface software upgrade required for new LabVIEW version.
- Linked new **DSG** mailing lists to DSG website.

Campero, Pablo

Magnet

- Researched touch panels screens used for Cryo Distribution Box and Torus controls.
 - ★ Downloaded C-More software V6.21 to open EAP9 files used by Automation Direct.
 - ★ Installed Demo Version for touch panel.
 - ★ 13 screens are used to control and monitor valves in TST and D.Box, vacuum system, and heaters.
- Worked on network and communication map for Torus control systems.
 - ★ Confirmed that communication map is correct.
 - ★ Fast Dump event occurs only if communication is lost between Fast-DAQ cRIO and PLC.
 - ★ Modified diagram with Mary Ann.
- Analyzed with Amrit and Peter algorithm used to read Cernox temperature sensors.
 - ★ Collected information from hallb_Eng/Torus concerning typical excitation requirements used in MultiSensor Excitation readback chassis for Cernox sensors.
 - ★ Found Resistance VS temperature table.
- Monitored EPICs screen for Cryo system, MPS and vacuum system, Torus on daily basis.
 - ★ Noted, noise is ~ 33 mV on readback signals in VT10 and VT6.
 - ★ On 10/17, noted that readback for magnetic fields in coils ~ -22 G and ZFCT current varies ~ -10 A, even when power for MPS is off.
 - ★ Noted with Peter that signals that compromise MPS screen can't be displayed in Mya Viewer archive charts.
- Installed demo version of C-More Programming software on DSGPLC1-PC to look at touch panel screens.

Eng. Brian

SVT

- Debugged R3 modules (S3 and S4). S3 had damaged LV connector on L1C end. S4 had SC cable issue (no bottom temp, but cable/connector looked fine). After repairs, made gain scans on modules.
- Backed up gain scan data files off clonfs mount due to work drive running out of space again. Still need to decide what to do with gain scan images.

Magnets

- Completed first pass of conversion to 2016 for LV chassis cRIO, still waiting on Ethernet/IP toolkit before saving as 2014 version.
- Installed NTP on Torus LV cRIO to keep its time in sync with other devices.



Detector Support Group

Weekly Report, 2016-10-19

- Fixed cernox issues by removing power dissipation from decision logic to set excitation current. Current now properly increases and decreases to get target dissipations based on temperature.
- Initial pass of magnet commissioning complete (to 350 A); continue to have meetings on progress to full power operation.

Hoebel, Amanda

HDice

- Hooked up instrumentation equipment in Controls Rack 2, with Mindy.
- Created spreadsheet of pump cart COMM and USB port instrumentation information.
- Submitted CCPR for x86 subnet port access issue.
 - ★ Port cannot access other equipment on x86 subnet.
- Updated LabVIEW to Service Pack 1 on personal computer.

Jacobs, George

- Discussions with Mac Mestayer about DC gas critical path tasks, time lines, and lead times.

RICH

- Created work request to wire up compressor.
- Attached outlet valve and hose connection to compressor.
- Created work request for new power feed in EEL 124, 208 V, 3-phase, 70 A service.
- Discussions with Walt A and Jason W about power for air compressor.

Leffel, Mindy

HDICE

- Controls rack.
 - ★ Worked with Sahin to complete component installation.
 - ★ Troubleshooting network and hardware issues with Mary Ann and Amanda.
 - ★ Finished cutting and attaching rubber insulation.
 - ★ Fabricated, tested, and installed two RF N – N plug cables.

SVT

- Worked with Sahin on R2.
 - ★ Installing faraday cage.
 - ★ Attaching cables with strain relief.

FT

- Located fiber optic cable covers and cleaning tool.
- Assisted with repositioning of Hodoscope.

Lemon, Tyler

RICH

- Repeated $d0$ measurement with fit procedure for mirrors 1 and 4 with Mary Ann.
 - ★ Mirror 1:
 - Measured $d0 = 1.509$ mm at linear motor position (Z) = 57 mm.
 - Fit $d0 = 1.32$ mm at $Z = 57.00$ mm.
 - ★ Mirror 4:
 - Measured $d0 = 1.410$ mm at $Z = 61$ mm.
 - Fit $d0 = 1.30$ mm at $Z = 61.00$ mm.
- Imaged mirror 1 and 4 using Shack-Hartmann sensor with Mary Ann using two methods:



Detector Support Group

Weekly Report, 2016-10-19

- * Fixed Z; CCD exposure times of 10 ms, 20 ms, 50 ms, 100 ms, and 500 ms.
- * Exposure time of 20 ms and 50 ms; images at Z over range of $fit-d0-Z \pm 14$ mm.
- * Images sent to INFN collaborators for analysis.
- Uploaded data from optical tests to <http://www.jlab.org/Hall-B/secure/clas12/RICH/Mirrors/CMA>
- Calculated residuals for mirror assembly radius of curvature.
 - * Mirror surface mean residual = $1.288 \text{ mm} \pm 0.279 \text{ mm}$.
 - * Back surface mean residual = $0.501 \text{ mm} \pm 0.268 \text{ mm}$.

McMullen, Marc

- Reviewed DC gas system software manual.

HTCC

- Worked with HTCC group on testing system flow.
 - * Added second MFC in monitoring system to verify flow going into detector; unsuccessful due to configuration of gas input.
 - * Currently, wall N₂ supplies a filter, then MFC (which is set to measure only), then pressure regulator, followed by rotometer, then another filter.
- Met with HTCC group with George to discuss proper setup of system. George suggests that it be set up in accordance with provided P/I diagram.
- Delivered molecular sieve to test area. When they reinstall input, this can be used to further dry out house N₂.
- Changed monitoring program so it can control gas, in addition to measuring.

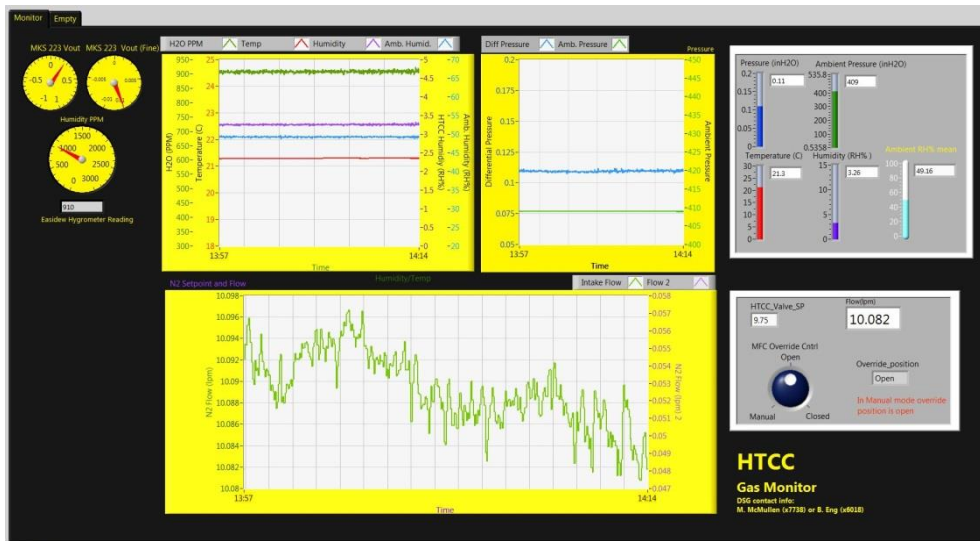


Figure 1 HTCC Monitoring, with additional manual flow control.

- Generated mailing lists for the DC, HTCC, and LTCC. These mailing lists will be used to streamline communication between DSG and detector leads.