

Running CCD in the ASC (in the test chamber)

RIXS-CCD Controls and Interlock Scheme (from 11/30 meeting with controls/DAQ)

Meeting with Patrick/Kaz/Bhavna (2/22):

- Cryotel IOC (Patrick's update)
 - IOC screen has PID controls, but since we only use PID in archon, that section will be wiped before we give this to users
 - For cryotel screen:
 - Hit only POWER mode: constant cooling, 60W
 - ON mode aka temperature mode: uses PID to get there
 - 3/8" tubing for chiller, raise flow rate
 - Software wise, everything is in place (trigger from the archon, timing, etc)
 - RIX:STA:CCD:01 as the base name for the PVs
- Waiting to hear from Dan about archon IOC and testing sensor in RIXS daq
- Next steps: meet with Dan, test basic functions, do a full cool-down/data collection/warmup at RIXS

This is a how-to for a single sensor. Ultimately, there will be two of these sensors at qRIXS.

Devices involved:

- Archon controller
- CryoTel controller
- Water chiller (small)
- Sensor with cryotel coldhead
- Laptop (PCxxxxx)

8 cable connections:

- Water lines to/from chiller x2
- Glenair signal cable from flange to archon
- 1-to-3 breakout controls cable between CryoTel coldhead/flange and cryotel controller
 - On the controller, one connection.
 - On the coldhead/flange side, three connections: Two black connectors which go to coldhead, and one db9 connector that goes to the flange.
- Cable that goes from CryoTel controller to coldhead
- Cat5 from Archon controller to laptop
- RS232 to USB cable from cryotel controller (RS232) to laptop (USB)
- Trigger cable to bottom BNC port on Archon

Navigating ArchonGUI:

1. Run `./archongui -small` (the -small option allows for a re-sizeable window)
2. File Open `*whatever_name_of_config_file*.acf`
3. Hit "Connect", "Auto Fetch", "Apply all"
4. Turn "Power On" on lower right, this is bias voltage
5. In "Slot 3: HeaterX"
 - a. Sensor C should be RTD1000
 - b. Heater A parameters:
 - i. Target: -100C
 - ii. Sensor: Sensor C
 - iii. Force: unchecked
 - iv. Limit(V): 25.0
 - v. P: 50
 - vi. I: 1
 - vii. D: 10
 - viii. IL: 20
 - ix. Ramp enable: checked
 - x. Ramp rate: 20mK/tick
 - c. Hit "Apply" (*note: hitting "Apply" will reset any values the PID had accumulated up to that point, like a refresh)

Cooldown takes ~2hrs.

CryoTel Software:

*note: The cryotel has a PID, but we don't use it. We use the other PID (via the Archon) that regulates the heater near/on the sensor. Keeping pwout to a minimum (i.e 60) keeps vibrations to a minimum.

1. Open new terminal: `sudo putty /dev/ttyUSB0 -serial -sercfg 9600,8,n,1,N`
2. Commands
 - a. View status: `"status"`

- b. Check cooler power: "pwout" (this should be 60. If not, set with "pwout=60")
- c. Turn cryotel on: "cooler=power"
- d. Turn cryotel off: "cooler=OFF" (might need to enter this command more than once to actually turn power off)

-----Only applicable for bench testing-----

Parameters on waveform generator:

- Waveform: Pulsed mode
- Frequency: 200Hz (or anything under 250Hz)
- Pulse Height: 3.3V
- Pulse Offset: 1.65V
- Pulse Width: 1us
- Burst Mode: ON (lately it seems you must have it on to see anything on detector)

Turning things off (warming up CCD):

1. Turn cryotel off (cooler=off)
2. Turn bias voltage off (power off on gui)
3. Set target temp to +10C
4. That's it

Troubleshooting issues and lessons learned:

1. If frames aren't updating, it's a trigger issue.
2. How to save data: NO TILDES, e.g. "/home/bnayak/test" and data gets saved as "test_4800x300_xx.raw" where xx is the frame count
3. Detector constantly running, "Save Sequence" just determines how many get data files get written
4. Make sure temperature is actually at the target temp (DO NOT CLICK ramp enable)