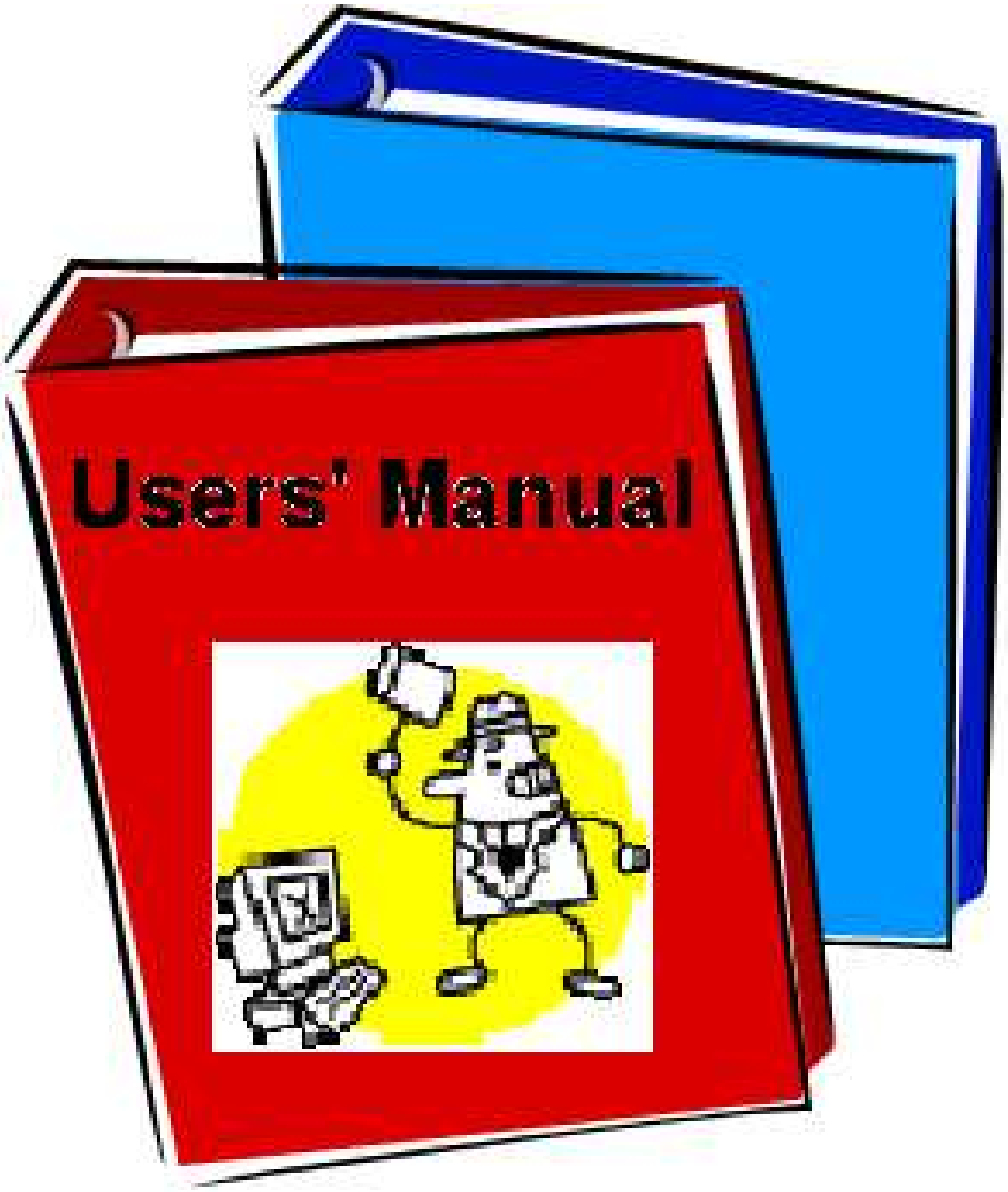

Users' Manual

VLS-PGM Manual

Start the “PGM Control Panel” by double clicking on the icon:

On the left hand-side of the panel there are:

1 The switches of the High Voltages apply to the Branch A. Here you turn ON/OFF the HV FL before & after a scan (see Sample Loading Procedure on page 22) when the Absorption Chamber is on Branch A.

2 The switches of the High Voltages apply to the Branch B. Here you turn ON/OFF the HV FL before & after a scan (see Sample Loading Procedure) when the Absorption Chamber is on Branch B.

3 Active Branch-line Selection (A or B).
Before start the run make sure the right Branch-line is selected.

4 The state (Closed/Open) of the Photon Shutters along the beamline.
(From here you can actually OPEN and CLOSE the Shutter two (PSH-2) and the PGM Shutter three (PSH.3-I20-01) without the use of the Panels “PGM frontend” and “PGM beamline” on page 11).

5 The state (Closed/Open) of the End-Station gate valve, for both branches.
(From here you can actually **OPEN** and **CLOSE** the Gate valves VVR.4-I21-04 and VVR.1611-4-I22-04 without the use of the Panel “PGM beamline” on page 11).

In the central part of the panel there are:

6 Energy Selection in eV, and related feedback. Once you start a scan the “User Data Acquisition Program” automatically sets this energy to the requested value.

7 Emergency Stop Button; it stops any moving motor in the “PGM Control Panel”

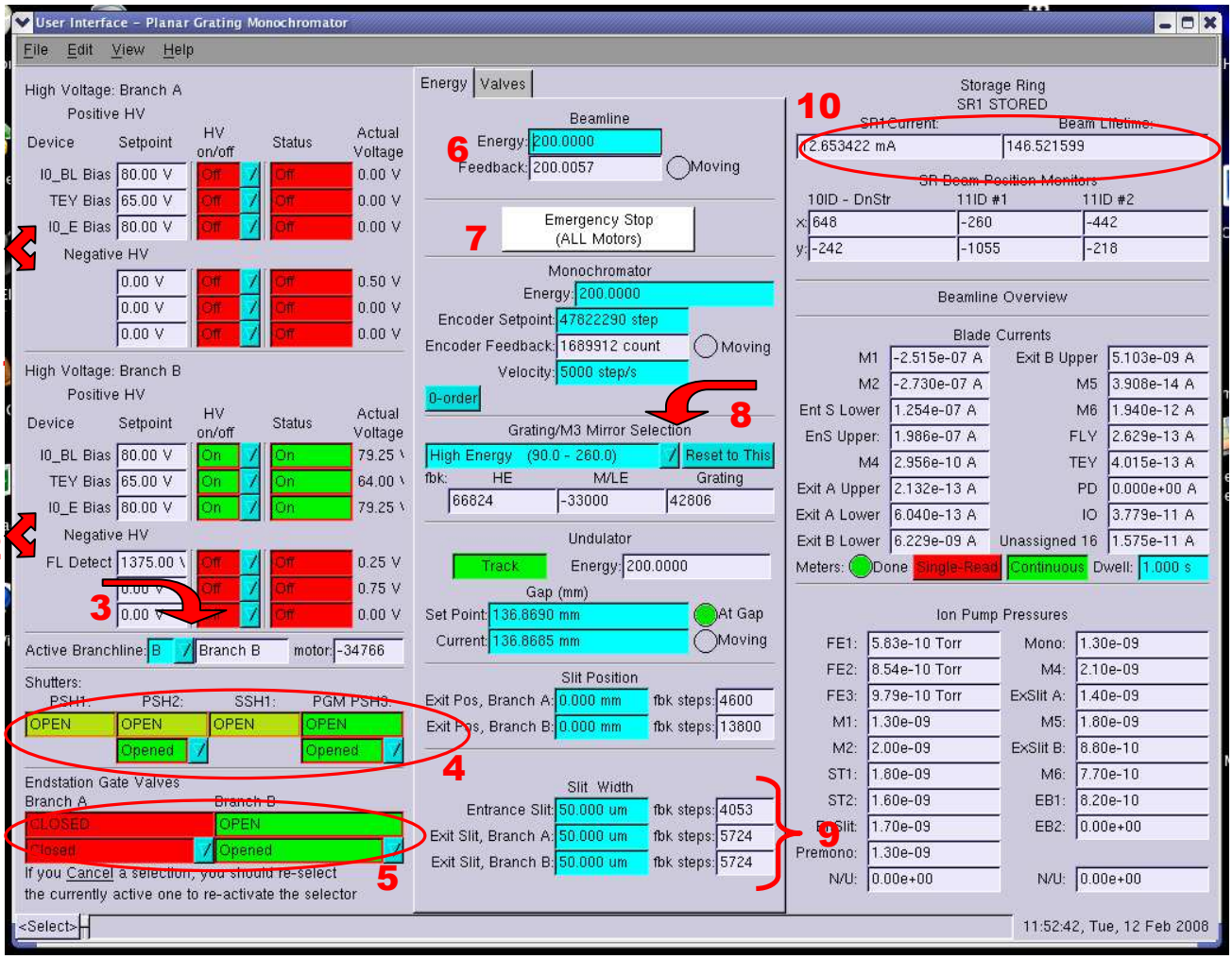
8 Grating Selection (High; Medium; Low).
Before start the run make sure you are working with the right grating.

9 SLIT WIDTH selections in µm (5-250 µm). The Entrance Slit (common for both branches) and the Exit Slits Branch A or B.

The right hand-side of the panel gives indication about:

10 The Ring Current and Beam Lifetime

and a general Beamline Overview



To change the grating to the desired range

1. Select from the Grating/Mirror Selection box **8** the desired grating.
2. Wait till all the three numbers in the white boxes (HE; M/LE and Grating) have stopped! They represent the motor step positions for the optical components inside the monochromator.
3. Type in the turquoise box **6** an energy close the value you need for your scan, this will adjust the Undulator to work in the range defined by the grating.

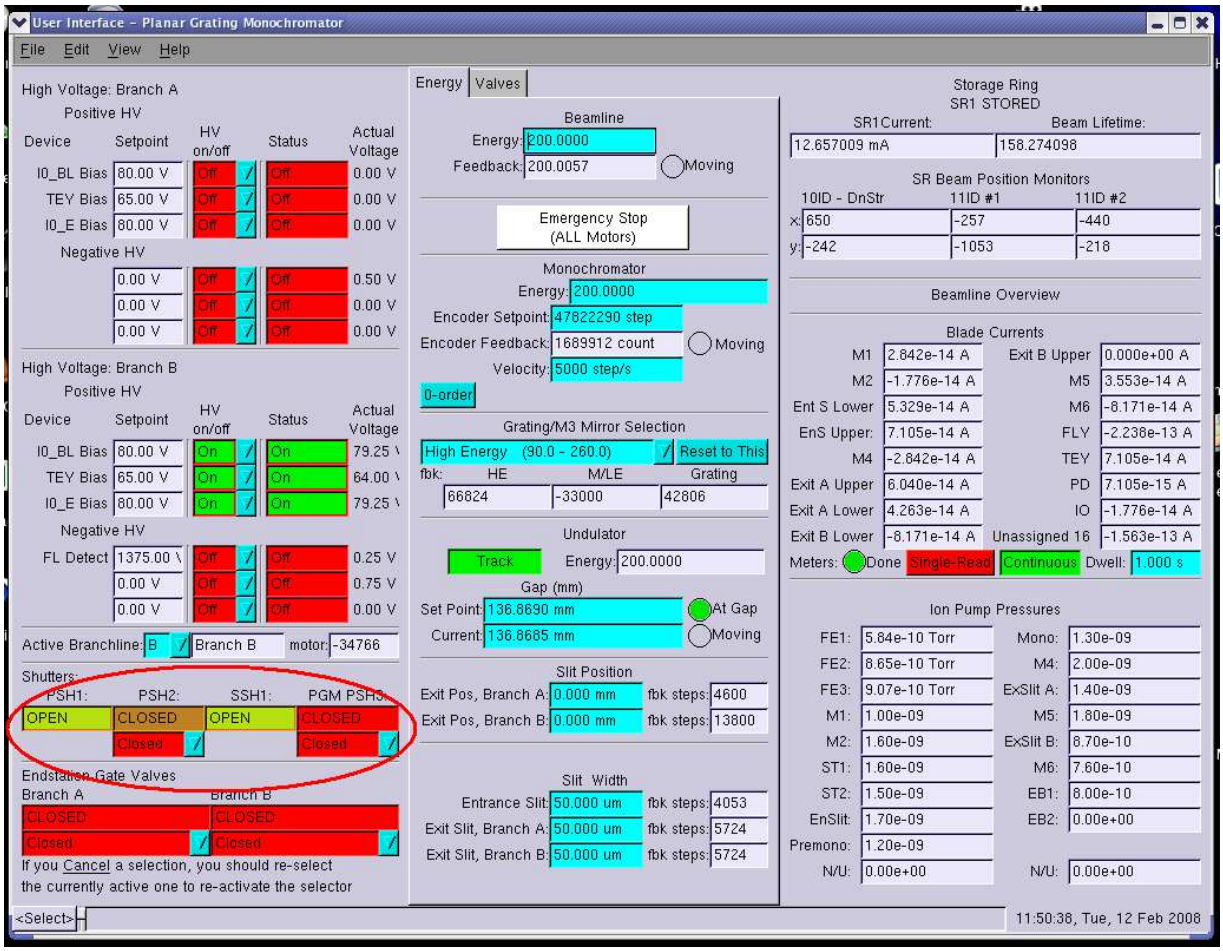
Always remember that this process is TIME CONSUMING ~5 minutes

Things to do AFTER EVERY INJECTION

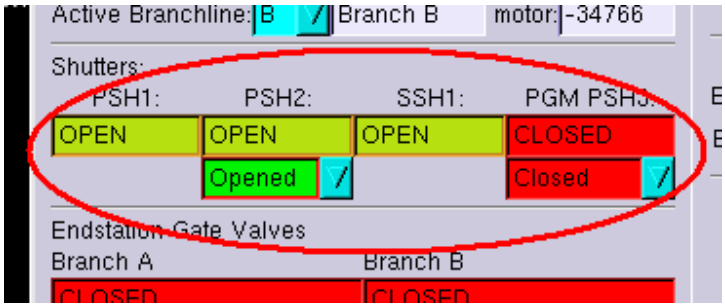
After every injection as soon as the control room has enabled the beamline and BEFORE start a new data acquisition you will have to **OPEN** few Photon Shutters.

1. First thing to do is MANUALLY **OPEN** the Safety Photon Shutter (SSH1) by the panel outside the hutch pushing the green button.

It is possible check the state of the shutter from the PGM control panel – User interface



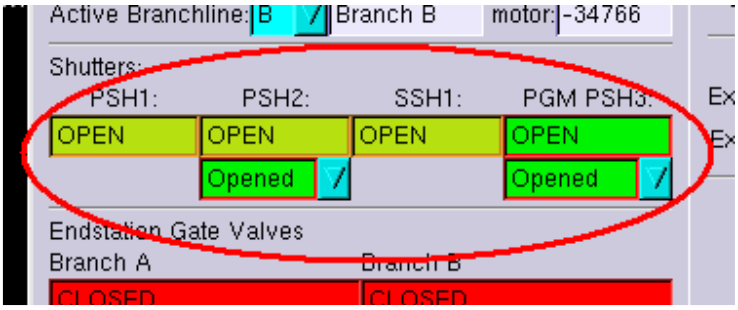
2. Next, **OPEN** the Shutter two (PSH2)



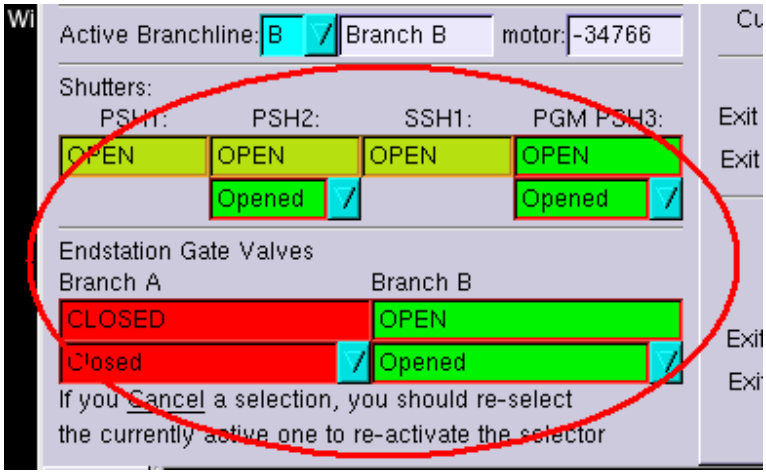
NB: this shutter (PSH2) is in COMMON with the SGM beamline.

Closing it could interrupt/jeopardize the SGM Users' experiment!!!

and the Shutter three (PGM-PSH3) from the PGM control panel – User interface.



3. Last, **OPEN** the End-Station gate valve of the Branch-line you are using. The light is now hitting your sample.



Solid State Chamber: Sample Loading and Removing Procedure

Removing:

1. Make sure FROM THE PGM CONTROL PANEL (VLS-PGM Manual pages 1 and 2):
   - the high voltage (-1450 V) on the fluorescence (FL) detector is OFF (ramped down and off);
   - the End-Station gate valve VVR.4-I21/I22-04 (connecting to the upstream of the beamline) is **CLOSE**.
2. Rotate the sample (manipulator) 180° cloak wise (CW), sample now facing the transfer rod (θ ~ 290°).
3. Open the manual gate valve (on the transfer side, downstream) by turning CCW.
4. Push the magnetic transfer rod into the main chamber (don't push it too hard, too fast, if it is stiff, pushing and rotating the magnetic spinner), a simple rotation should unlock the sample from the main chamber manipulator; once it is locked onto the transfer holder, gently pulling the transfer rod back to the load-lock area (ideally in one motion, pulling and rotating, to avoid the drop of the sample due to vibration).
5. Make sure you see the end of the transfer rod (with the sample ☺) from the window of the load-lock section, then close the manual gate valve between the main chamber and the load lock area.
6. Turn off the turbo pump of the load-lock section (pushing the start/stop button), vent the load-lock section using the Nitrogen line (green valve), open the door with the view port, unlock the sample from the transfer rod and you are now ready to load another sample.

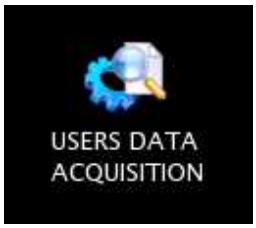
Loading:

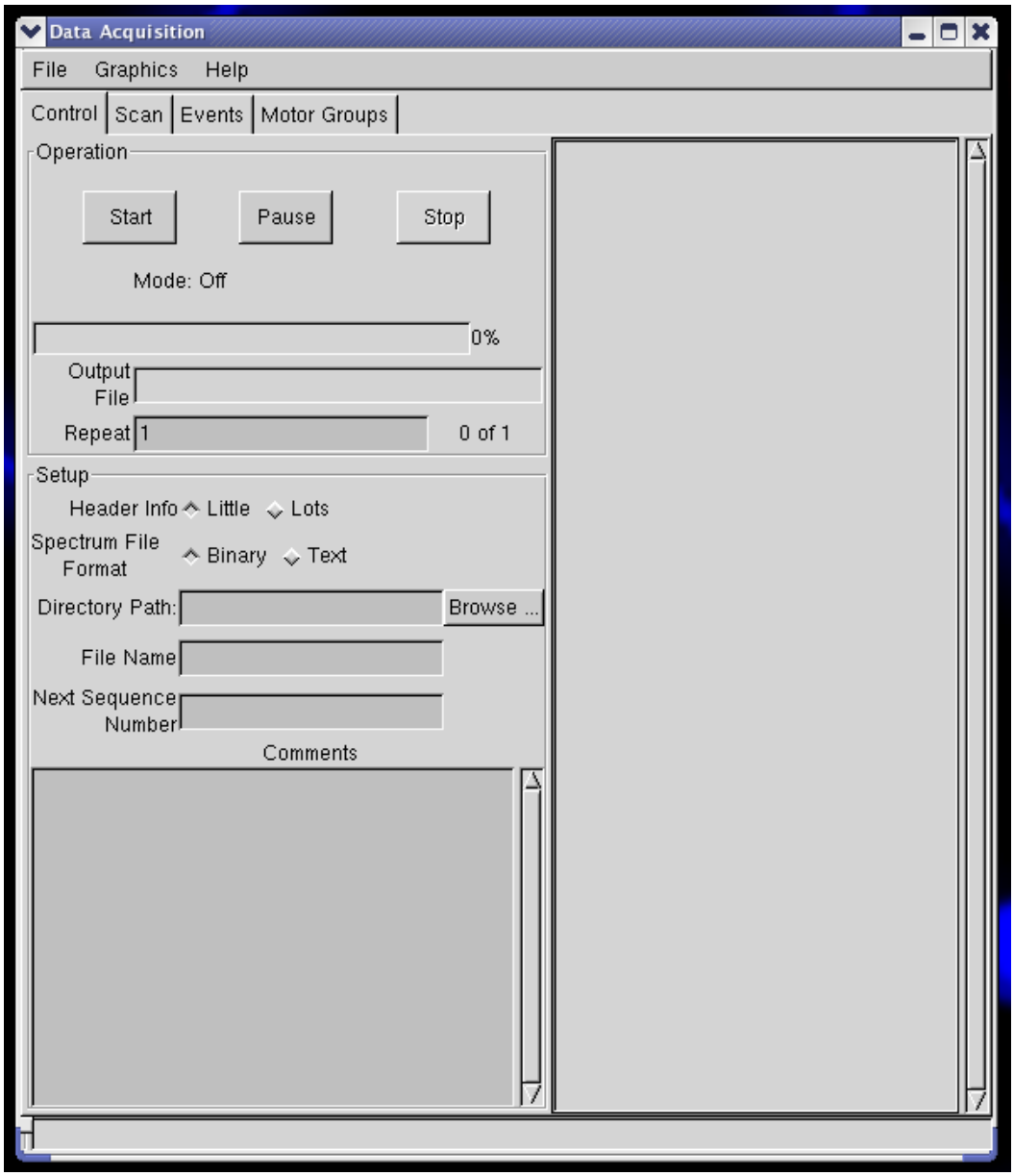
1. With your sample properly mounted on the sample holder and the load-lock section up to the air, load the sample to the transfer rod.
2. Close the Nitrogen line, close the door with the view port and start the pump (pushing the start/stop button).
3. Wait till the pump reaches the NORMAL OPERATION and the pressure in the load-lock section is better than 6.1 mTorr (i.e. 5.8 mTorr), open the manual gate valve (turning CCW) between the load-lock and the main chamber; the pressure in the main chamber should stay better than 3×10^{-6} Torr (i.e. 2.8×10^{-6} Torr).
4. The sample holder on the main chamber manipulator should be facing the transfer side; a simple rotation on the magnetic spinner should unlock and lock the sample to the manipulator.
5. Pull the transfer rod out of the main chamber (gently and in one motion), be sure that you see the end of the transfer rod from the view door.
6. Close the manual gate valve (turning CW), and rotate the sample (in the main chamber) 180^{o} CCW, facing the beam! (θ ~ 120°).
7. If the pressure in the main chamber is reasonable (better than 5×10^{-7} Torr; i.e. 4.8×10^{-7} Torr) FROM THE PGM CONTROL PANEL switch **OPEN** the End-Station gate valve VVR.4-I21/I22-04 between the main chamber and the upstream of the beamline and turn ON the FL high voltage (-1450 V).

 You are now ready to run your sample!

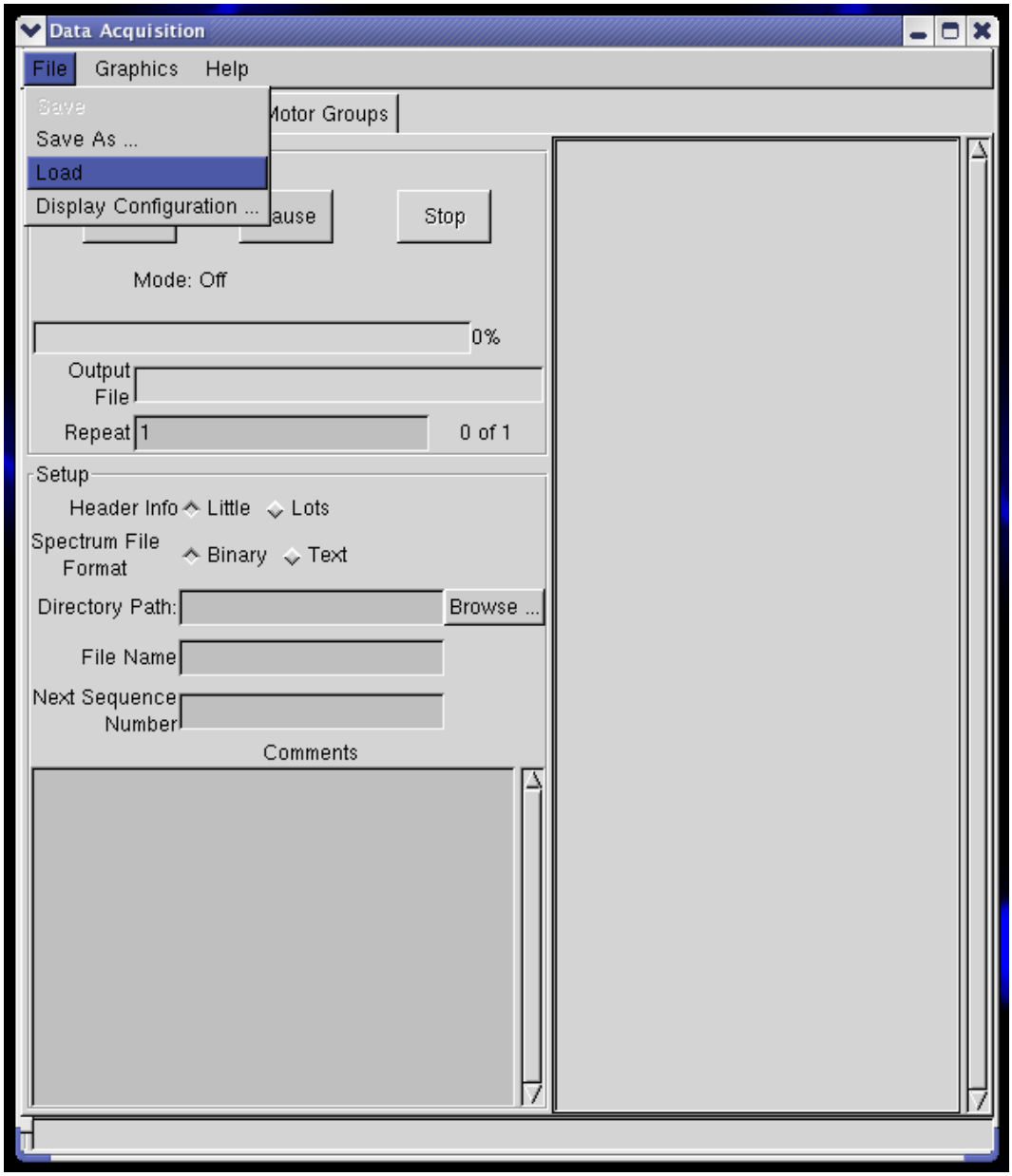
USERS DATA ACQUISITION

Start the “USERS DATA ACQUISITION” by double clicking on the icon:

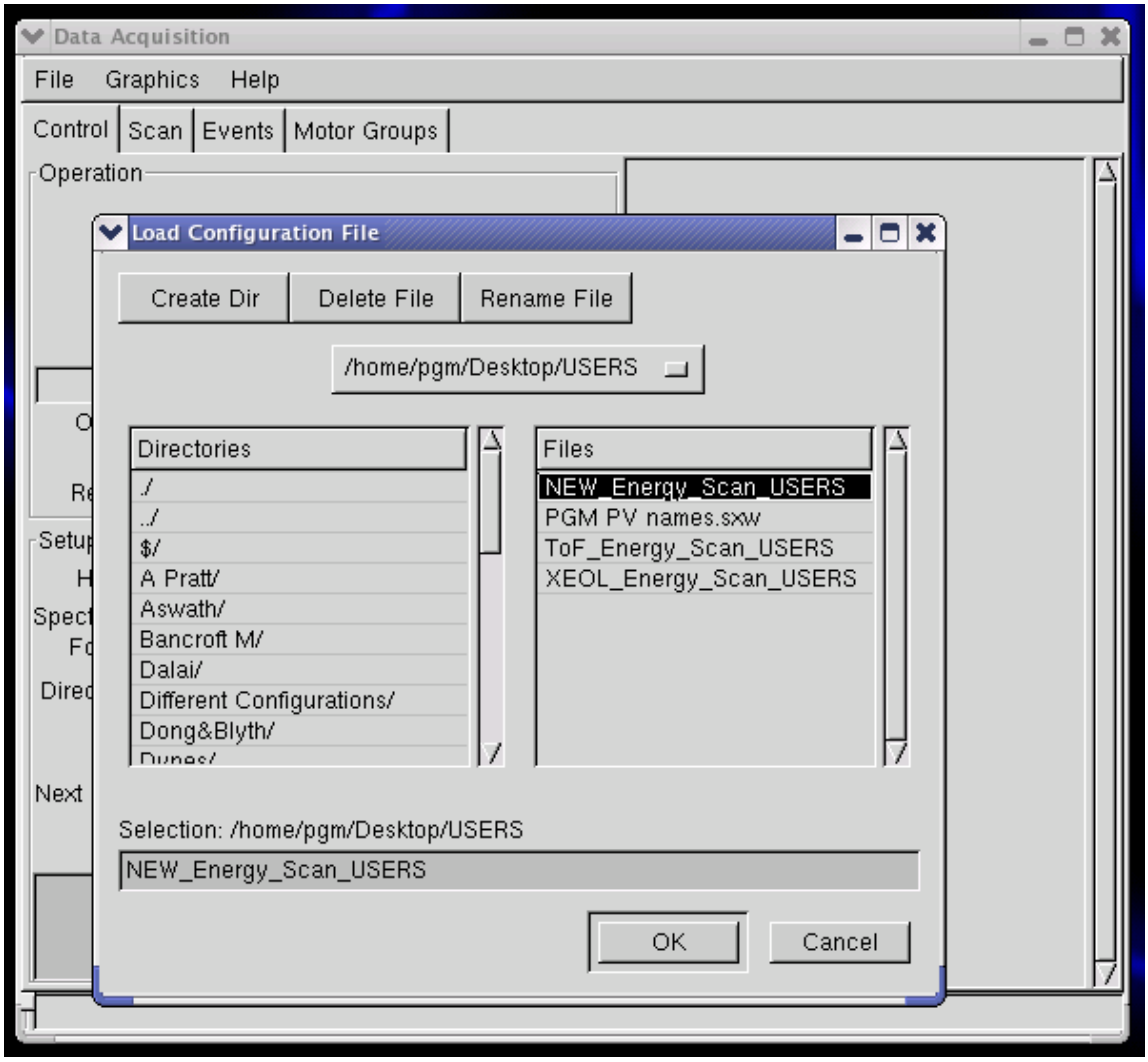




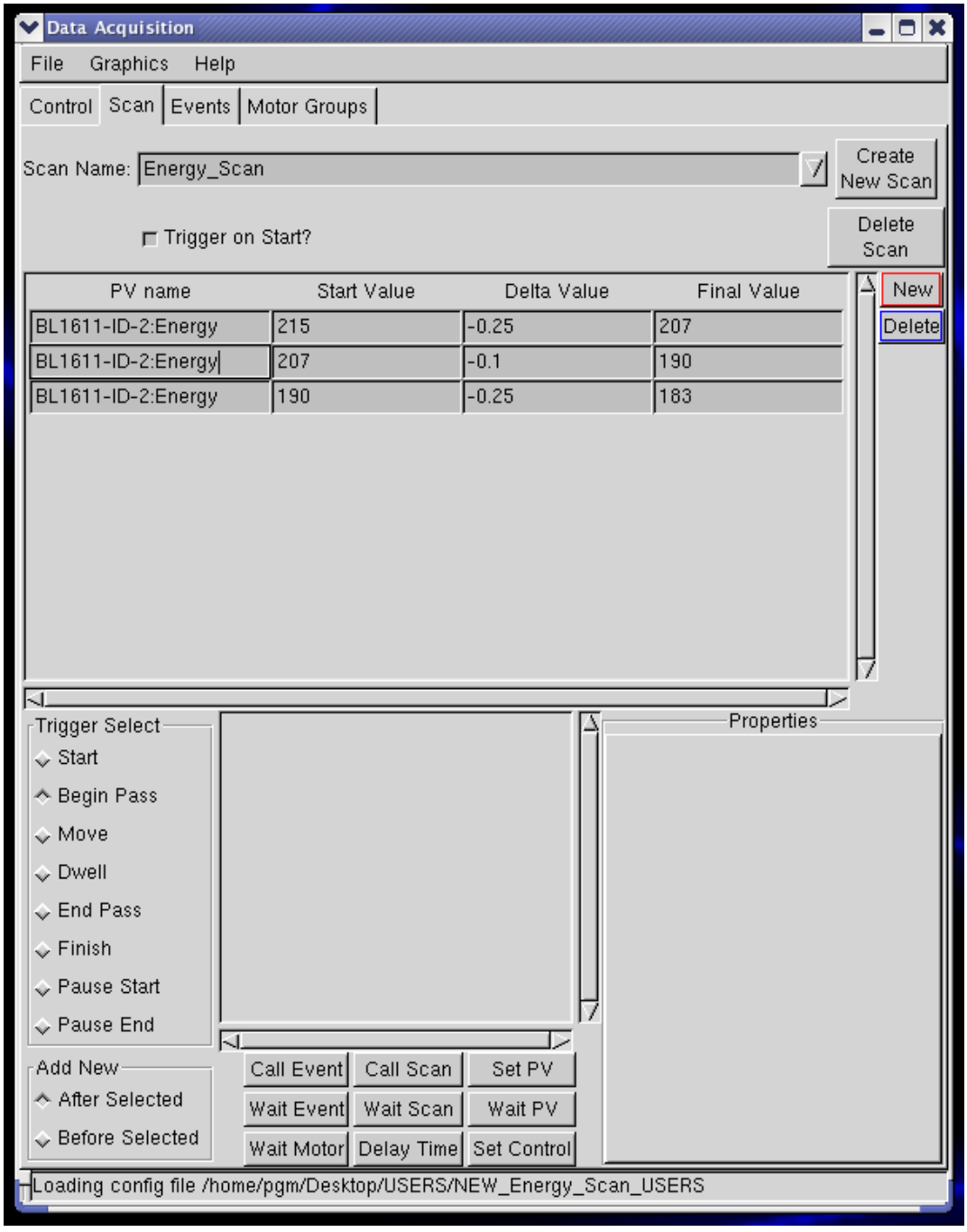
From the “File” menu Load the configuration file “NEW_Energy_scan_USER”



Work your way down the directory tree until you see the configuration file required.
this file is in the '/home/pgm/Desktop/USERS directory (folder)

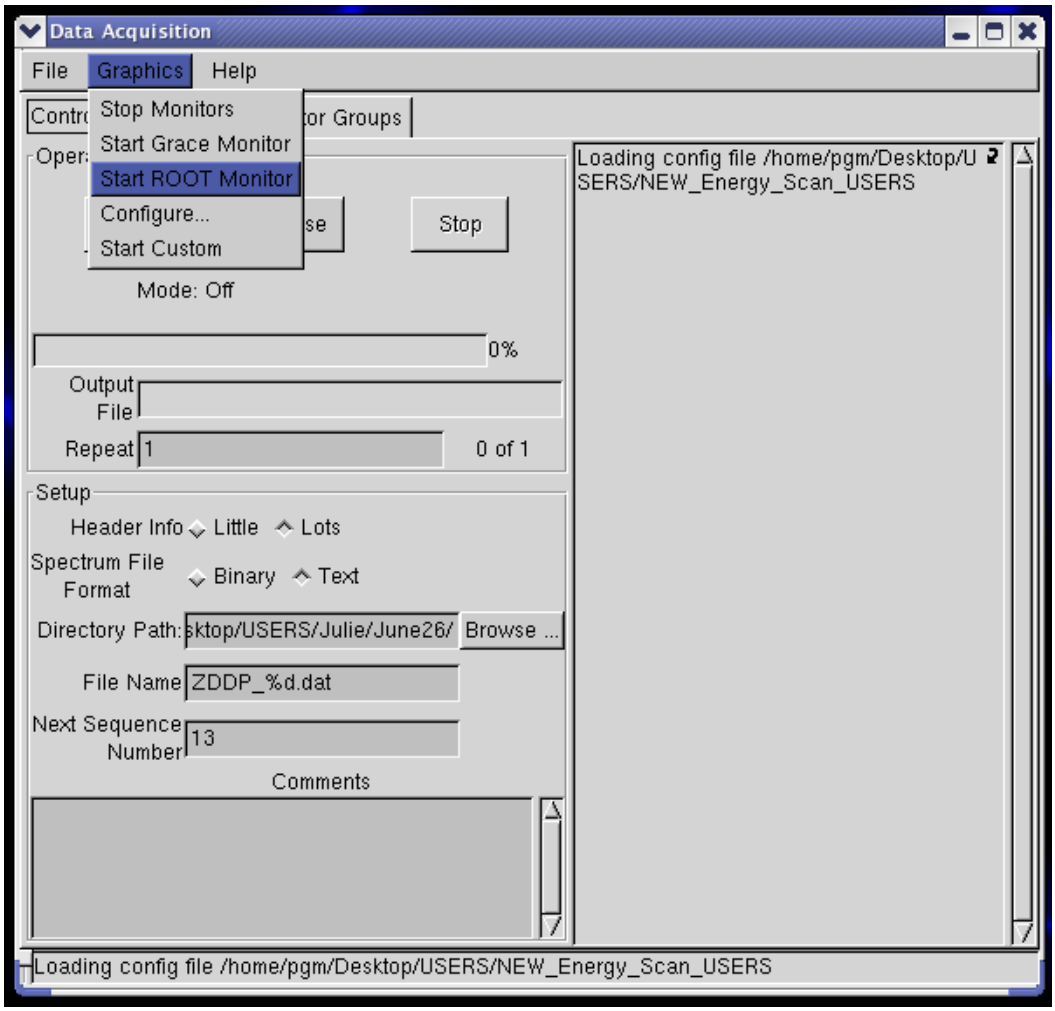


In the Scan page make sure you are scanning over the right energetic range, from higher (Start Value) to lower (Final Value) energy, with a negative step (Delta Value).

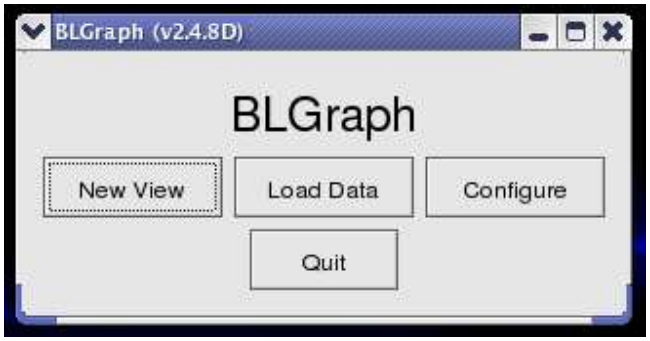


You can also scan over several consecutive regions with different steps (delta values).
To add a new region click the New button.
To delete a region click the Delete button.

To visualize the data while acquiring, select “Start ROOT Monitor” from the “Graphics” menu



This window will pop up:



Keep the BLGraph window always open, DO NOT press the “Quit” button.
Automatically a new plot will start at the starting of each scan.

Next, check the settings in the Control Page (see picture on page 6):
User's data are generally saved in '/home/pgm/Desktop/USERS' under your own directory.
The "Directory Path" shows where yours file will go
In the "File Name" the symbol "%d" will give you sequential file numbers for sequential runs.
Click "Start" in the Control page of the Data Acquisition when you are ready to scan.

VLS-PGM PV names

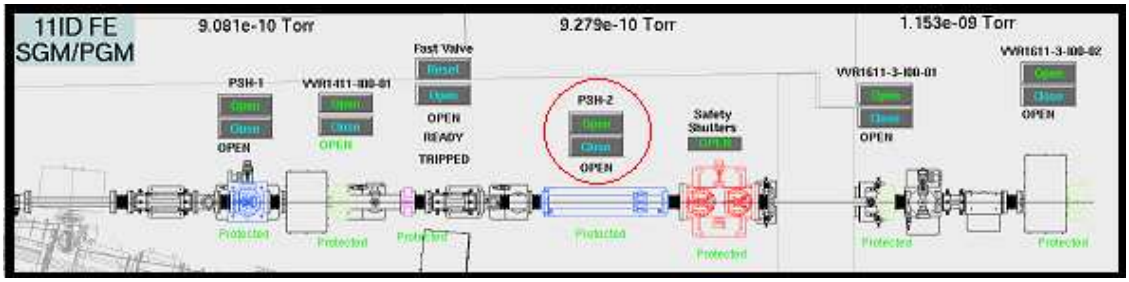
BL1611-ID-2:Energy:fbk	☞	Beamline Energy feedback (eV)
A1611-4-11:nA:fbk	☞	EndStation Ni mesh Io current (nA)
A1611-4-09:nA:fbk	☞	TEY (nA)
A1611-4-08:nA:fbk	☞	FLY (nA)
A1611-4-10:nA:fbk	☞	Si Photodiode current (nA)
A1611-4-02:nA:fbk	☞	Branch A Exit Slit Lower Blade current (nA)
A1611-4-03:nA:fbk	☞	Branch A Exit Slit Upper Blade current (nA)
A1611-4-04:nA:fbk	☞	Branch B Exit Slit Lower Blade current (nA)
A1611-4-05:nA:fbk	☞	Branch B Exit Slit Upper Blade current (nA)
A1611-3-03:nA:fbk	☞	Entrance Slit Lower Blade current (nA)
A1611-3-04:nA:fbk	☞	Entrance Slit Upper Blade current (nA)
UND1411-02:gap:mm:fbk	☞	Undulator Gap (mm)
PCT1402-01:mA:fbk	☞	SR1 current (mA)
SMTR16114I2004:enc:fbk	☞	Encoder Feedback
BL1611-ID-2:Energy	☞	Beamline Energy
A1611-4-12:nA:fbk	☞	Beamline Ni mesh Io current (nA)

Trouble shutting

In the RARE event that you are not able to **OPEN** the Shutter two (PSH2), there are a number of things that should be check.

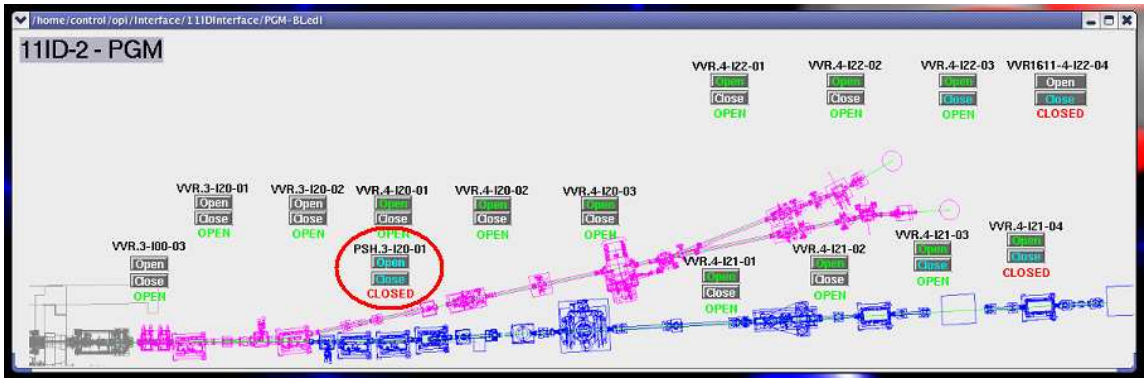
Start the “PGM FRONTEND” and “PGM BEAMLINE” by double clicking on the icons:

“PGM FRONTEND” panel:



Check that the beamline has been **ENABLED** by the control room and that the Safety shutter is opened by the panel outside the hutch. If closed, MANUALLY open the Safety shutters pushing the green button.
From the Computer screen **OPEN** the Shutter two (PSH-2) on the PGM frontend panel.

“PGM BEAMLINE” panel:



Check that all valves (VVR.*) are **OPEN** on the PGM frontend and PGM beamline panels.
If closed, **OPEN** the Shutter three (PSH.3-I20-01) on the PGM beamline panel.

NB: All the valves (VVR.*) of the active Branch have to be in the **OPEN** position, to be allowed to open the Shutter three (PSH.3-I20-01).
Keep these two panels open and running on one of the Desktops.

If all the valves (VVR.*) are **OPEN** but you still cannot **OPEN** the Shutter two (PSH2) start the SGM/PGM flow switches display by double clicking on the icon:

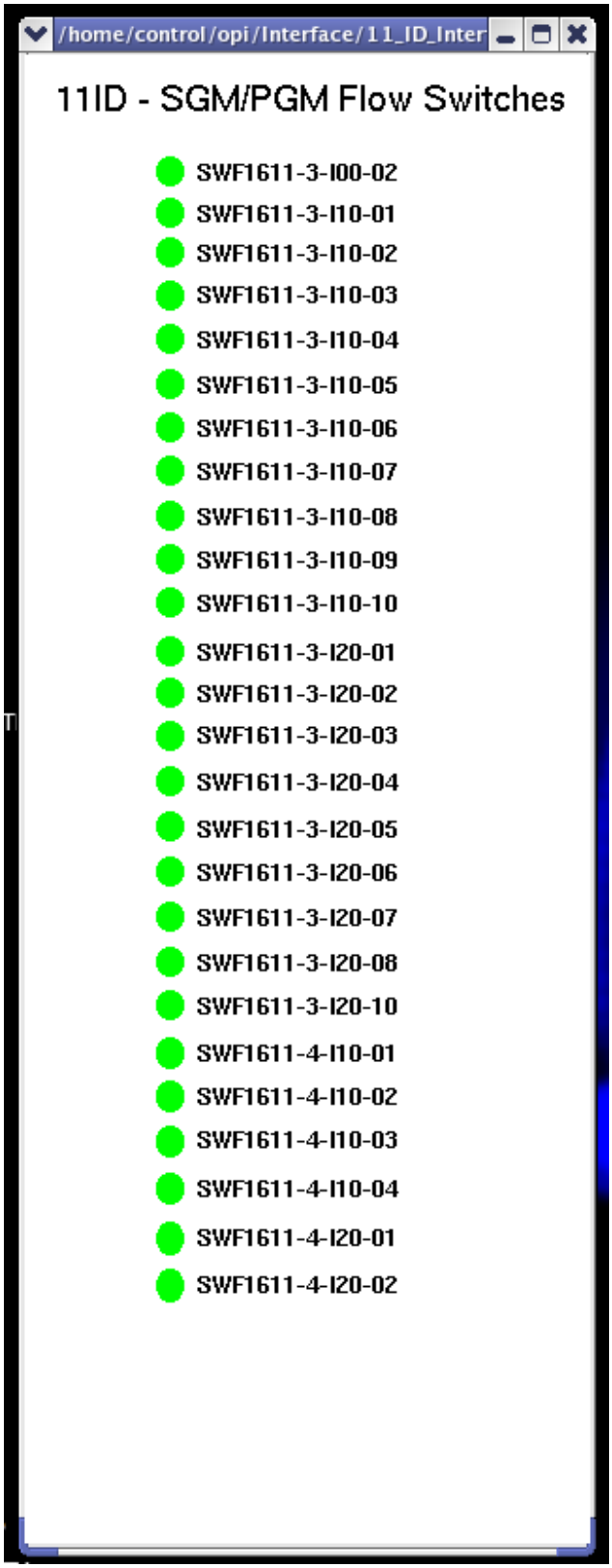
Check that ALL the Flow Switche indicators ● are green.

The indicators beginning with SWF1611-3-* are water cooling indicators inside the SGM/PGM hutch.
The SWF1611-4-* are water cooling indicators outside the hutch.

If any of the indicators are red ● you will have to contact either

- the beamline staff or
- the Floor Coordinator and ask for the technical support on call.

The person on call will re-equilibrate the water flow along the beamlines. Once done, the indicators should turn green ●, and you should be able to **OPEN** the Shutters and proceed as normal.



High Voltage Controller

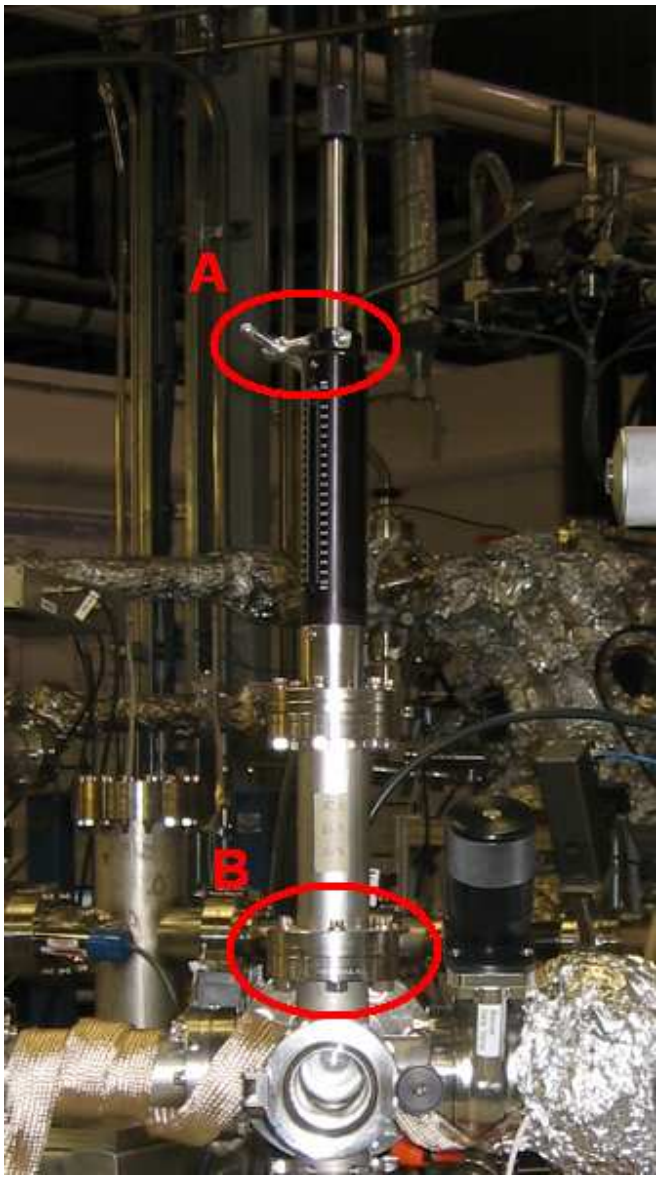
If the HV controls **1** & **2** on page 2 are not responding (i.e. you try to switch OFF or ON and nothing happen) and the pressure in the end-station chamber is better than $5x10^{-7}$ Torr; it means the HV control application has locked up. The options are:

- During "office hour" contact Dr Ru Igarashi (office # 2025; phone x 3751)
- Otherwise contact the Floor Coordinator and ask for the CID on call. Ask the CID on-call to log on as root onto IOC1611-427 and do the sequence:

```
service clsHV stop
service clsHV start
```

Multiple sample holder

In the unfortunate event the multiple sample holder breaks (usually somewhere around the **A** highlight section) due to the very intense use, you will have to contact either



- the beamline staff or
- the Floor Coordinator and ask for the technical-mechanical support on call.

Let the load-lock section up to the air, as when you load a new sample, and ask to the person on call to remove the multiple sample holder ladder from the **B** flange and substitute that with a blank flange.

Let the load-lock section pump till it reaches a pressure better than 6 mTorr.
At this point you will be able to continue your experiment loading just one sample every time.