

# Manual of Control and XAFS Measurement Software at BL-11A of the Photon Factory

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This software was originally developed by PF XAFS Group for hard X-ray beamlines at the Photon Factory and modified for BL-11A by Ms. Yasuko NAGATANI of the Beamline Control Group.

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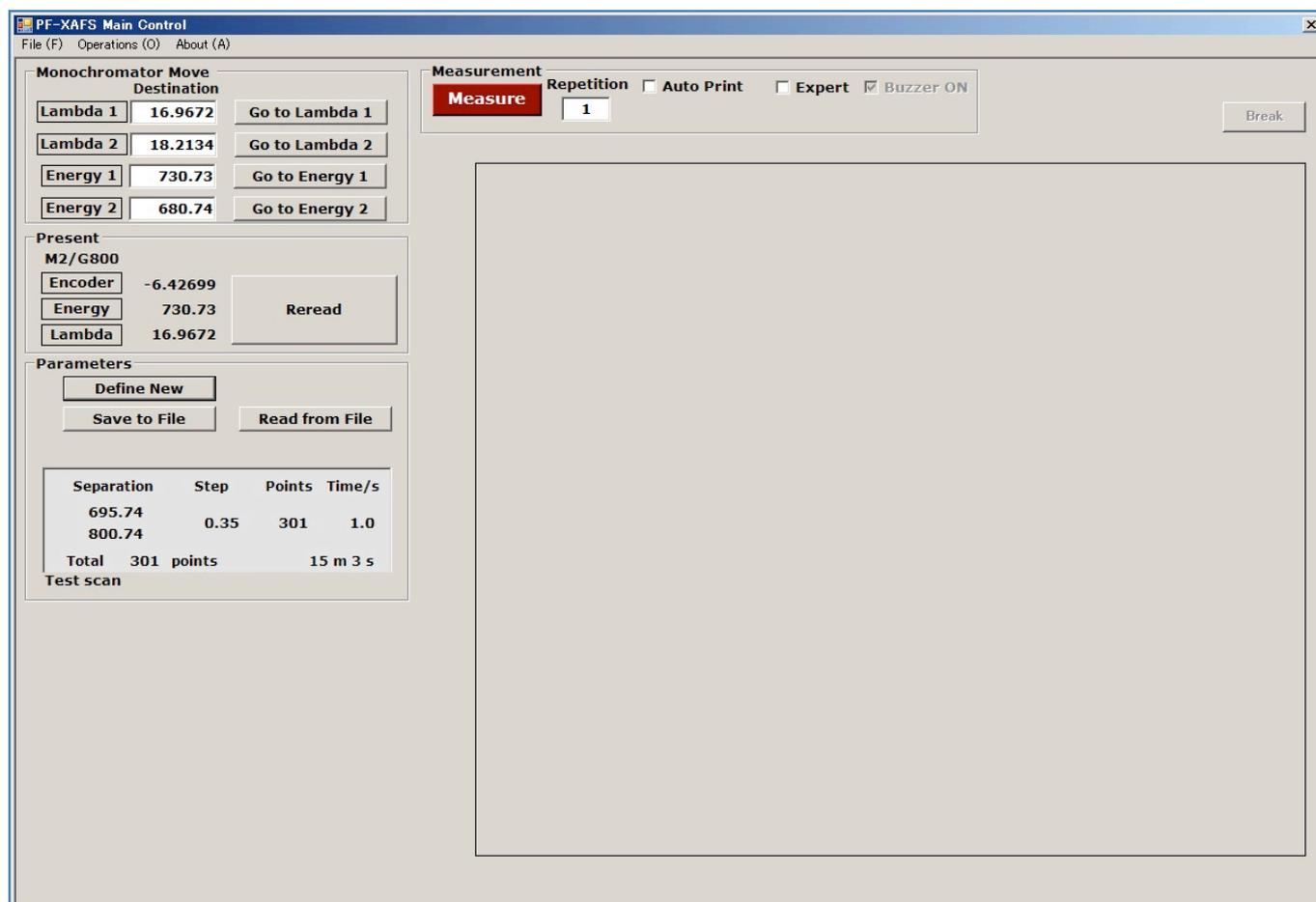
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## 0. Start Up

Select 'blco' as a user and enter password 'bl-11a' when restart the station PC.



Firstly double-click 'managerstart' to activate STARS system and then double-click 'BL11A-GUI' to start the software to open a 'PF-XAFS Main Control' window.



Monochromator Move : To change photon energy or wavelength

Present : To show the present photon energy and wavelength

<NOTE : 'Reread' should be used when Spherical mirror M1/M2 and/or Grating are exchanged>

Parameters : To set parameters for XAFS measurement

Measurement : To start XAFS measurement

1. To change photon energy or wavelength

Enter destination energy [eV] <or wavelength [A]> in a Destination box for Energy 1 or 2 <or Lambda 1 or 2> in the 'Monochromator Move' panel and then click [Go to Energy 1 or 2] <or [Go to Lambda 1 or 2]>.

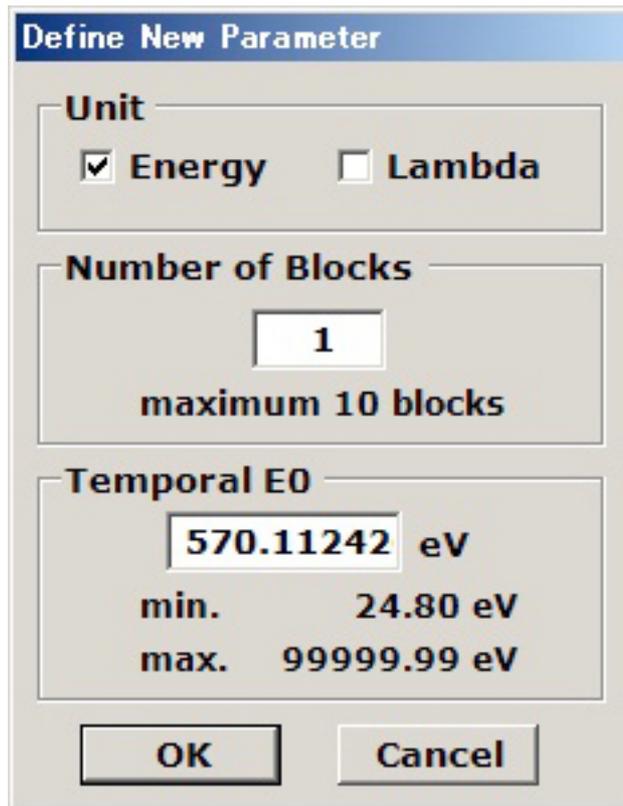
1 or 2 is just to set two different values and the operation is the same.

For emergency stop, push STOP button of the PM4C-05-1.

2. To set parameters for XAFS measurement

2-1. New parameter

Click [Define New] in the 'Parameters' panel to open 'Define New Parameter' panel.



Select Unit <Energy or Lambda of Wavelength> and enter Number of Blocks of the XAFS measurement. Temporal E0 as an edge energy can be set <not necessary>.

Click OK to proceed.

Enter Separation point and Step in the unit eV for energy or A for wavelength and also dwell time for each block. Then click [Check] to see the number of points estimated measurement time.

Note : [OK] button will not active unless click the [Check].

Note : At BL-11A, Separation energy should increase like the example. The other scan direction is not allowed.

In this panel, number of Blocks can be changed by 'decrease' or 'increase' button.

[Read] and [Save] button is to be used for load and save a parameter file.

**Parameter Calculator**

E0 /eV  Unit: Energy / eV Block: 3  decrease  
 increase

k	Separation	Step	Points	Time/s
	<input type="text" value="500"/>	<input type="text" value="0.5"/>	<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text" value="515"/>	<input type="text" value="0.1"/>	<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text" value="540"/>	<input type="text" value="0.2"/>	<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text" value="600"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="text"/>		<input type="text" value="0"/>	<input type="text" value="1"/>

**Total**  points  
 m  s

[Calc k] is to be used for the calculation of wave number  $k/\text{\AA}^{-1}$  assuming the edge energy of E0, which has no effect to the measurement itself. Click [OK] to continue.

## 2-2. Previously saved parameter

Click [Read from File] in the 'PF-XAFS Main Control' window to load a parameter file for XAFS measurement.

### 3. Measurement

#### 3-1. Mode option for the measurement



Repetition : Repetition time.

Auto Print : Automatically print the spectrum after the measurement, however, not effective at present with no printers.

Expert : Check to use additional channels from ch2 to ch7 other than ch0 and ch1.

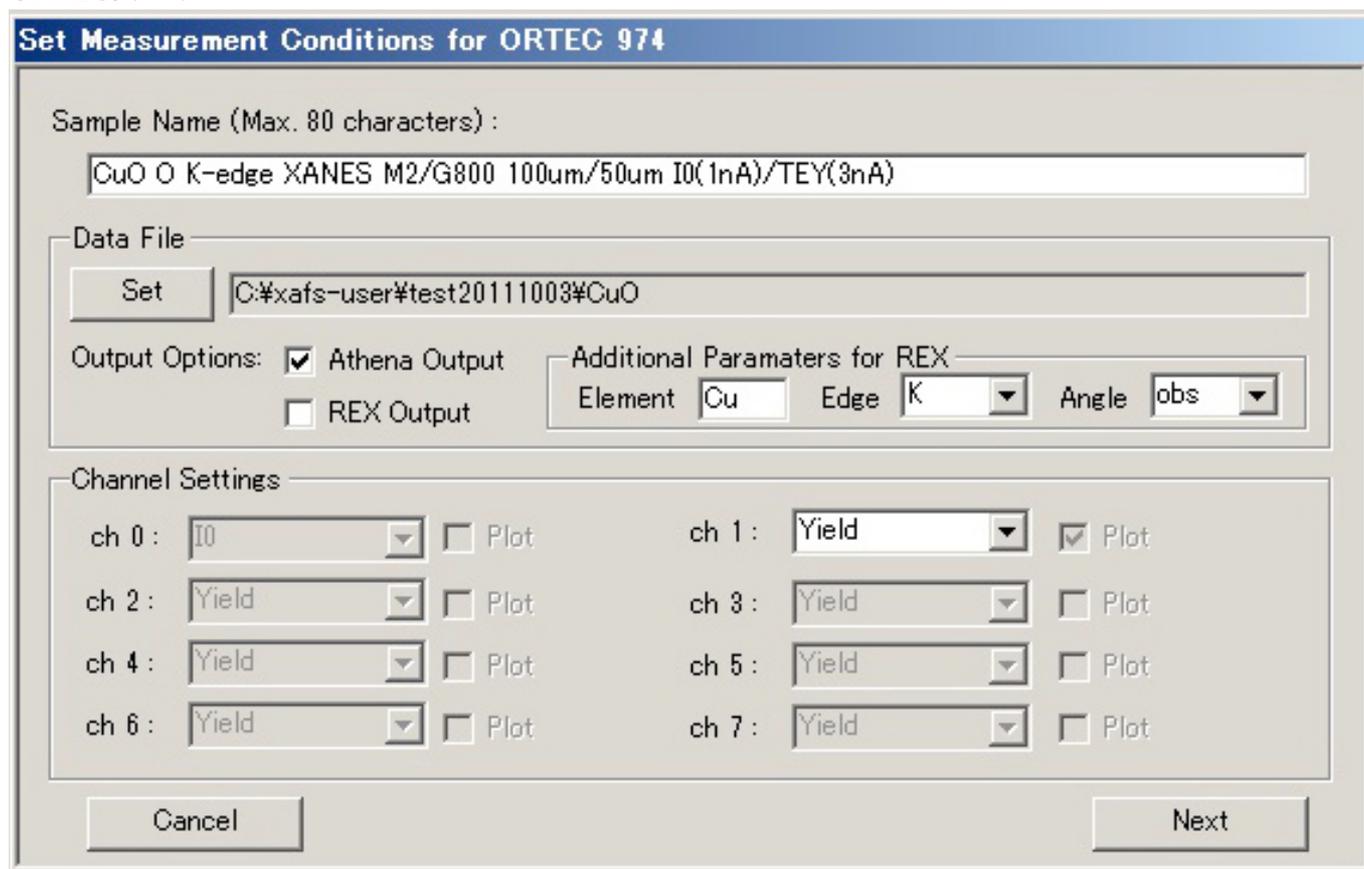
Buzzer ON : For beep (but too small volume)

After set above, click [Measure] to continue.

#### 3-2. Sample name etc.

##### 3-2-1. Sample name, File name and Channel settings

'Set Measurement Conditions for ORTEC 974' panel is used <actually TSUJICON NCT08-01 instead of ORTEC974>.



Sample Name : to enter sample name etc.

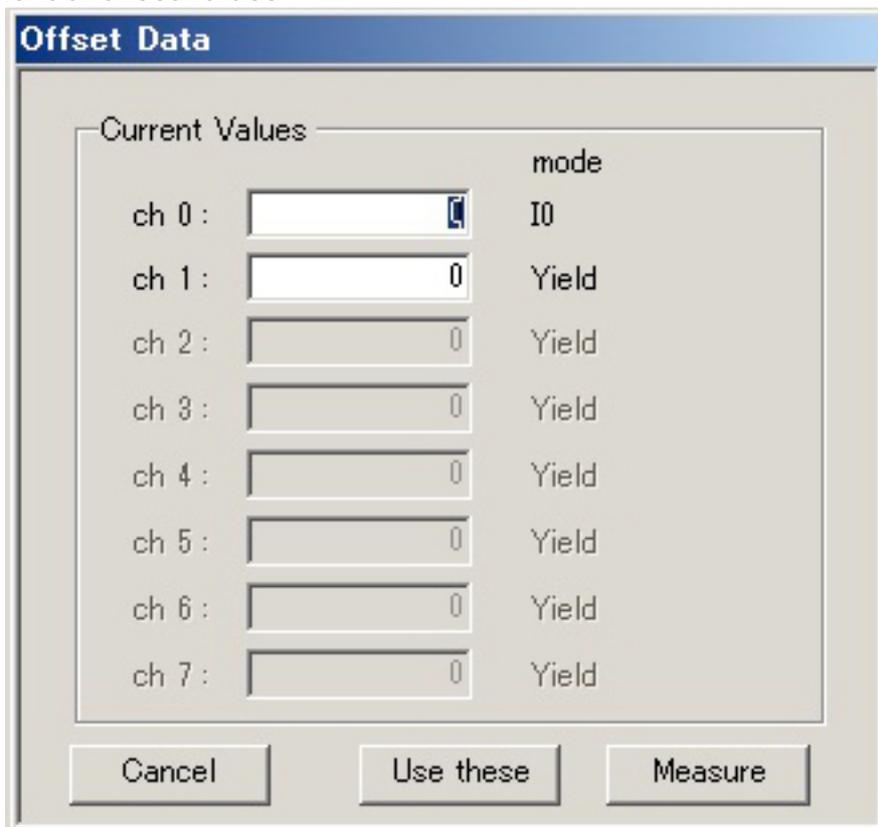
Click [Set] to indicate data file name.

Output Options are used to make additional data in other format for Athena and REX analysis programs.

Channel Settings : to select measurement mode for each channel.

Plot : to select a channel to draw spectrum during the measurement.

### 3-2-2. Measurement of offset values



Offset value for each channel is to be measured or entered.

Click [Measure] to measure offset values.

After the offset measurement, click OK to continue. It takes 10 times of the dwell time.



### 3-2-3. Start measurement

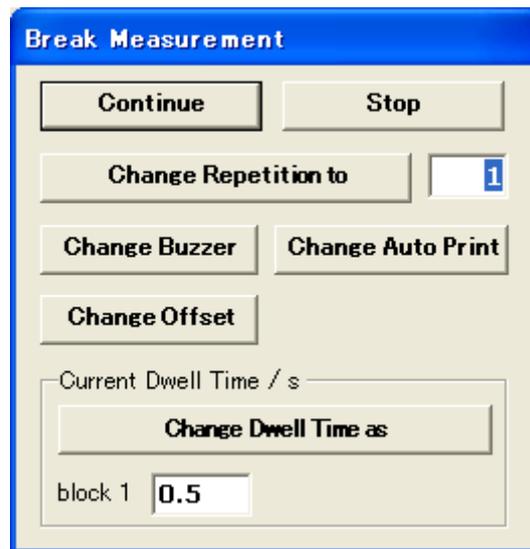


Click [OK] after open the shutter, again click OK to start measurement.



### 3-2-4. during the measurement

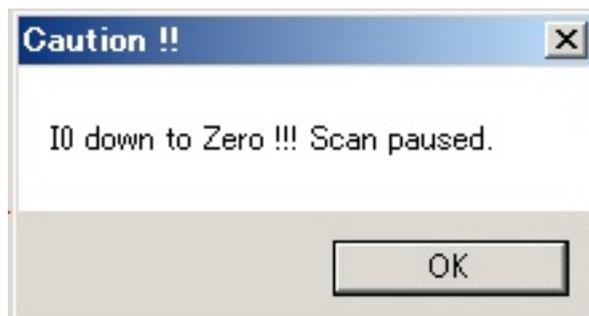
'Break Measurement' panel appears if [Break] button is clicked during the measurement.



[Continue]	restart the measurement
[Stop]	quit the measurement
[Change Repetition to]	change repetition time
[Change Buzzer]	change ON/OFF of the buzzer
[Change Auto Print]	change mode of auto-print <not effective>
[Change Offset]	change offset values
[Change Dwell Time as]	change Dwell Time

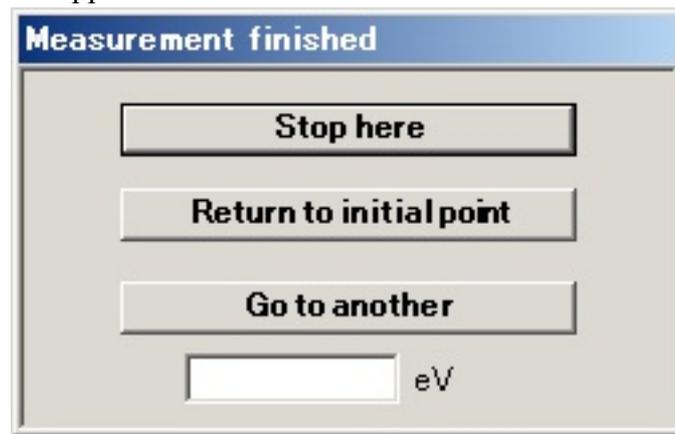
### 3-2-5. Abnormal

'I0 down to Zero !!! Scan paused' panel appears when the X-ray intensity becomes too weak. Click [OK] if you want to continue measurement.



### 3-3. End of measurement

'Measurement finished' panel appears when the measurement has finished.



[Stop here]

No change of the monochromator.

[Return to initial point]

Return to the initial point of the measurement

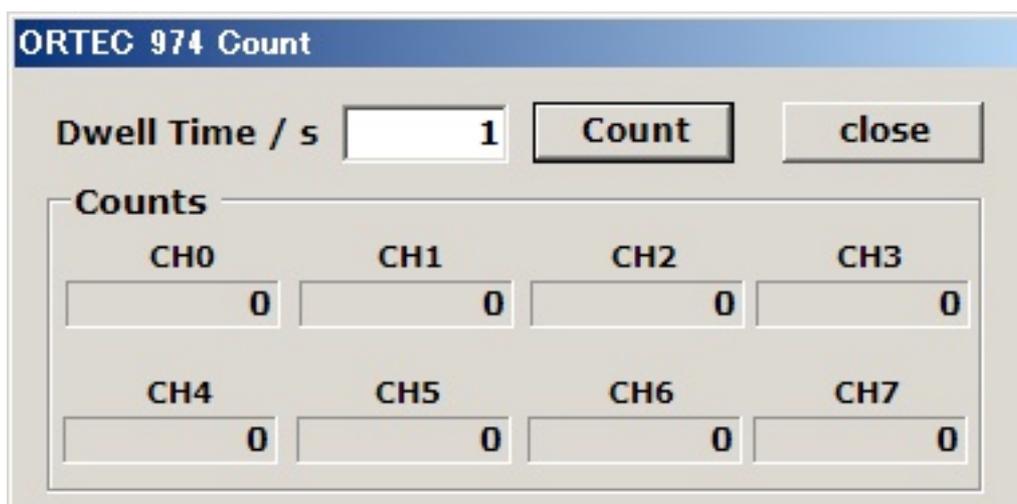
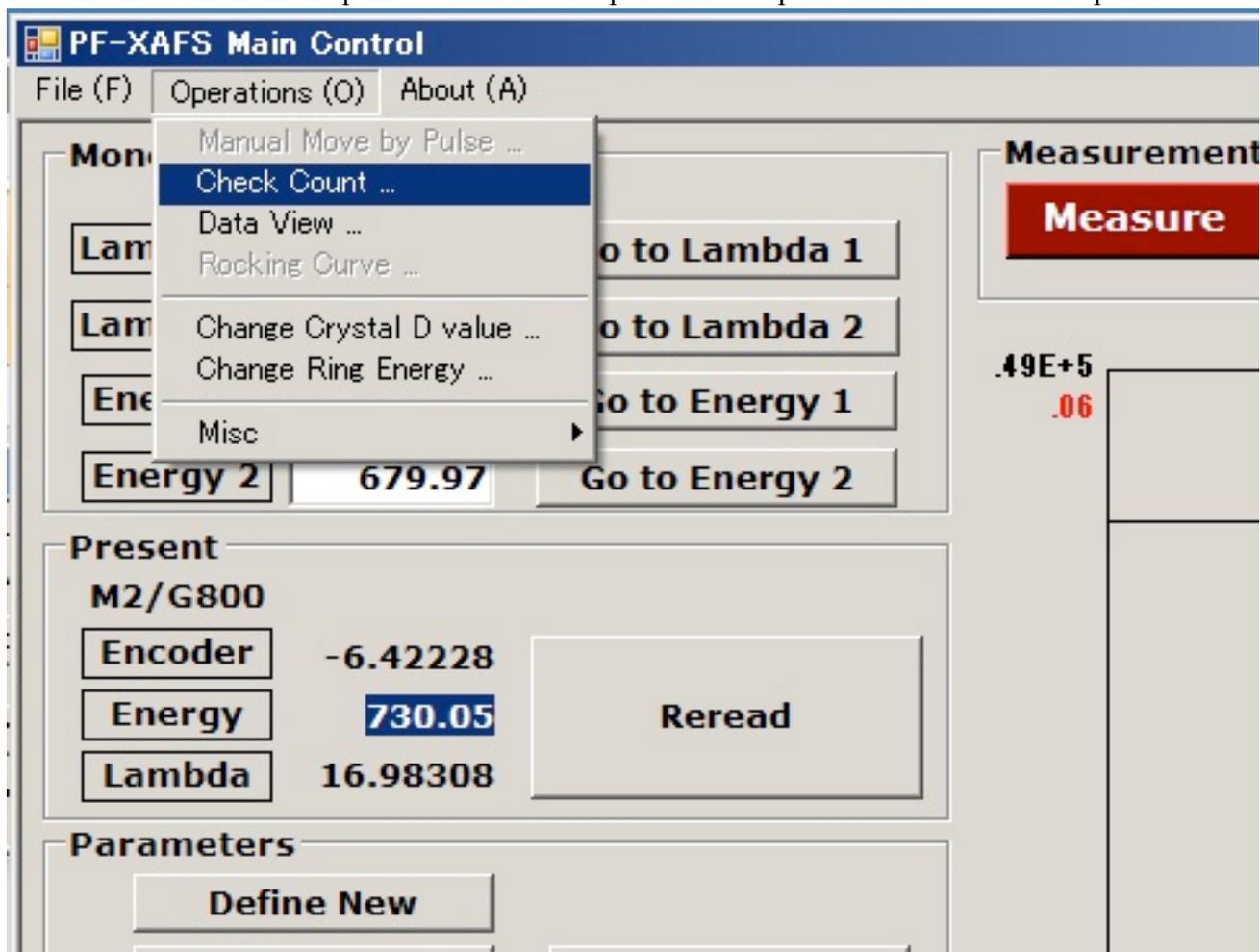
[Go to another]

Go to an energy entered in the box.

#### 4. Miscellaneous functions

##### 4-1. count check

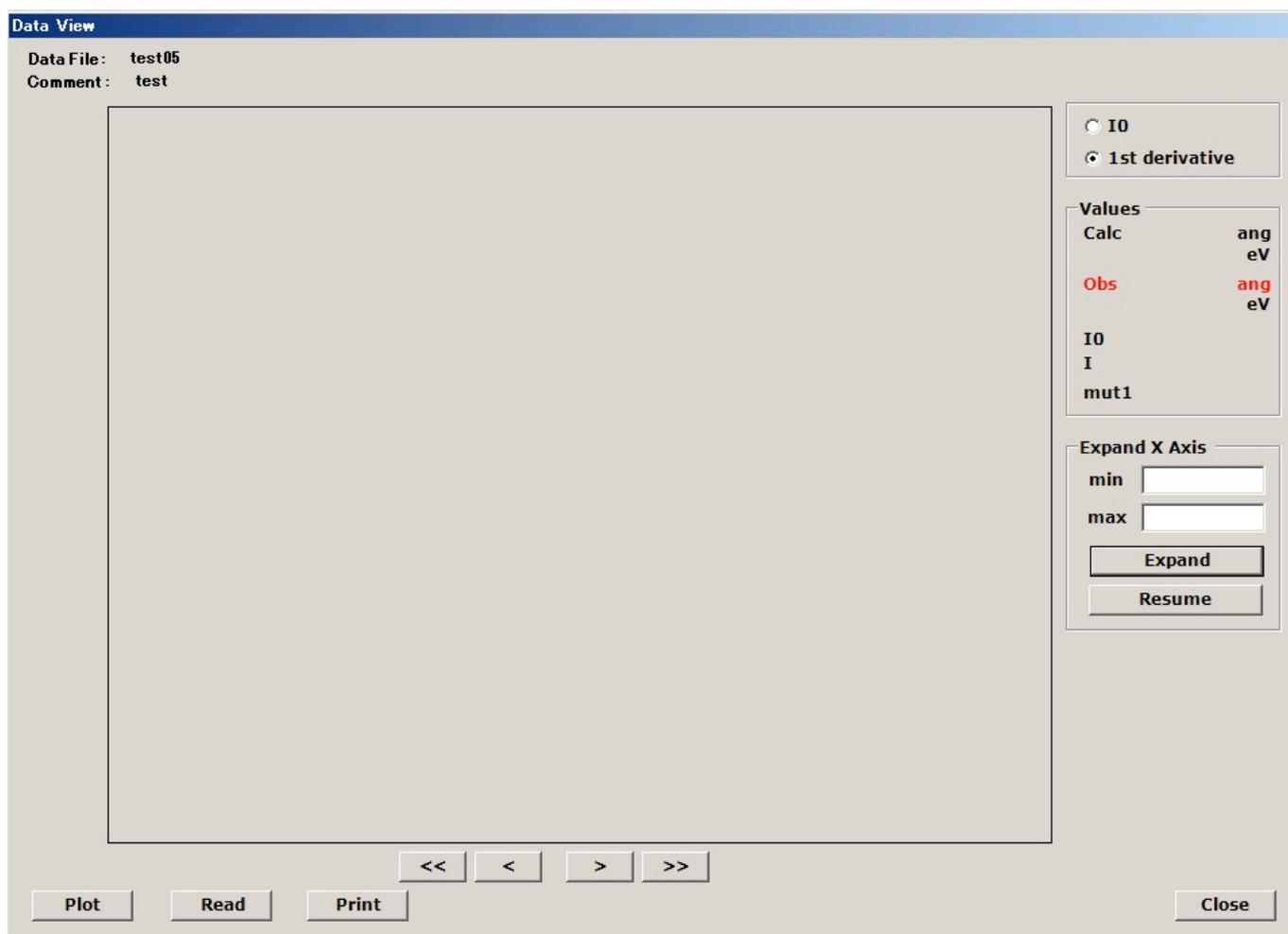
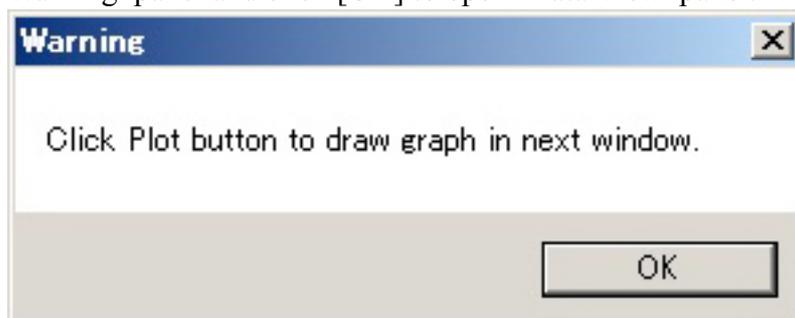
Select Check Count from the pull-down menu of Operations to open 'ORTEC 974 Count' panel.



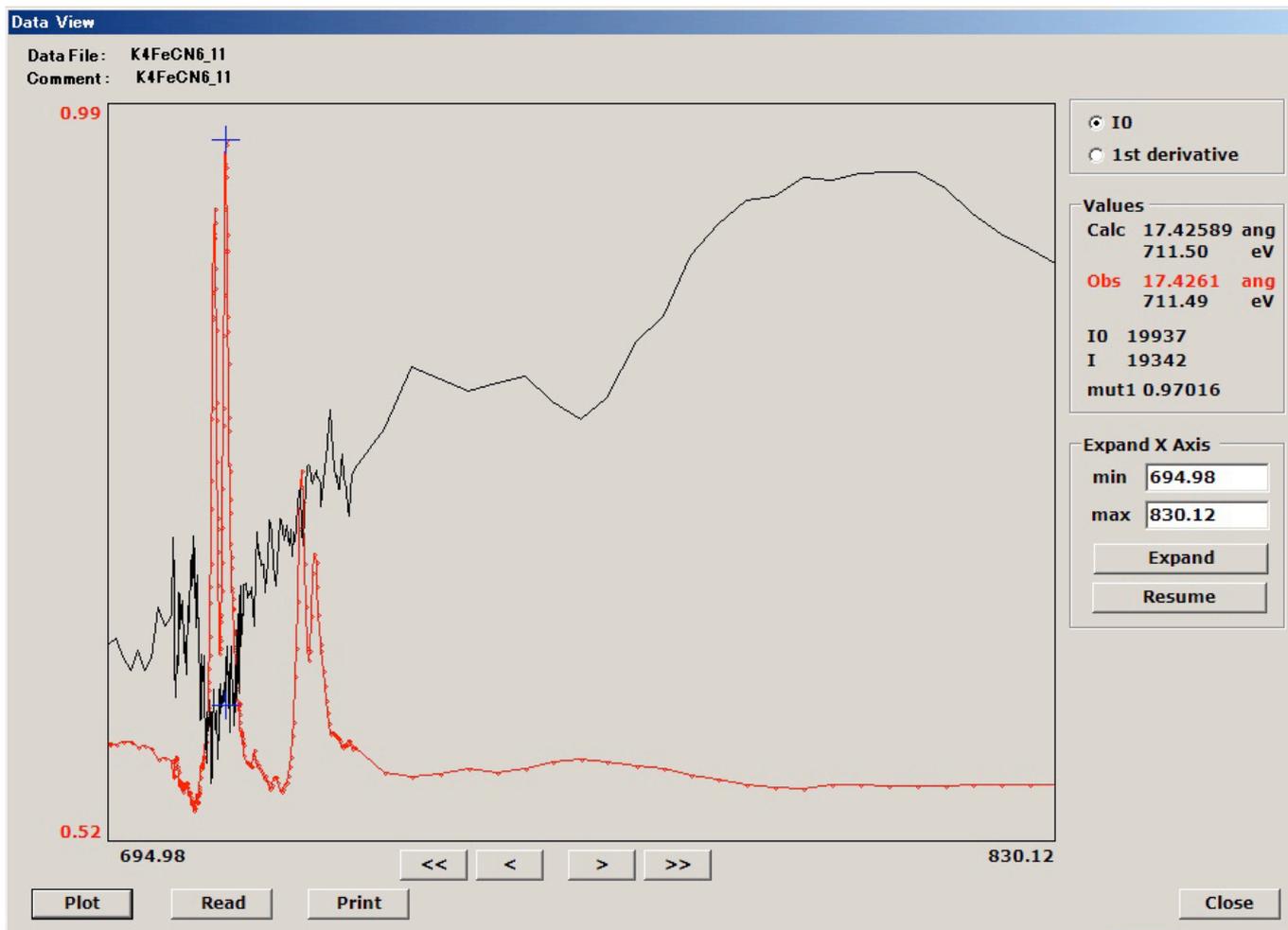
Set Dwell Time/s and click [Count] to check counts of 8 channels.

## 4-2. Data View

Select Data View from the pull-down menu of Operations to show the spectrum.  
Read the message in 'Warning' panel and click [OK] to open 'Data View' panel.



To view the graph, click [Plot].



Previous data can be loaded by click of [Read]button.

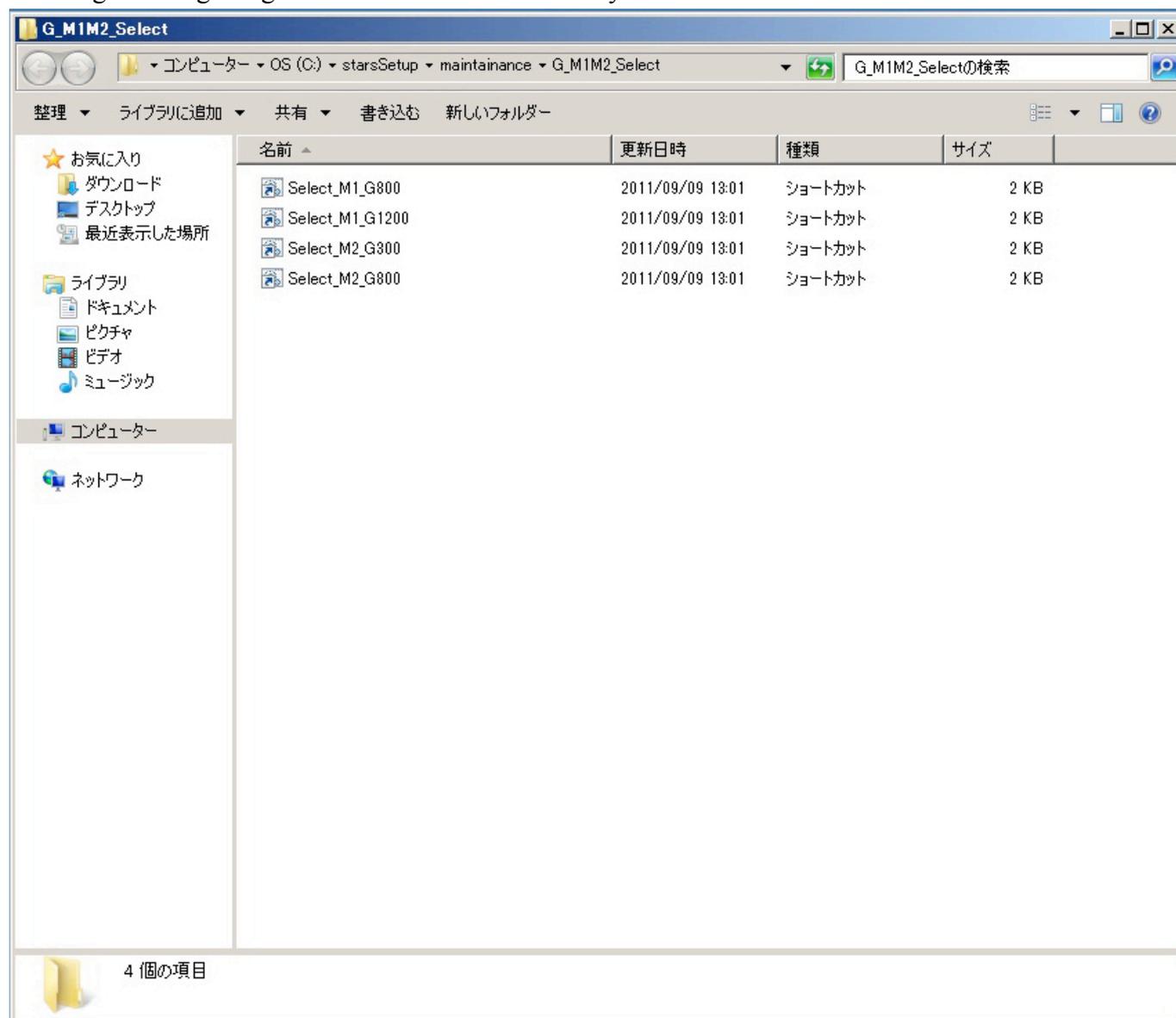
## 5. Other functions presently not included in the main software

### 5-1. Selection of spherical mirror and grating of the monochromator

At present, exchange of the spherical mirror and grating cannot be done in the XAFS software.

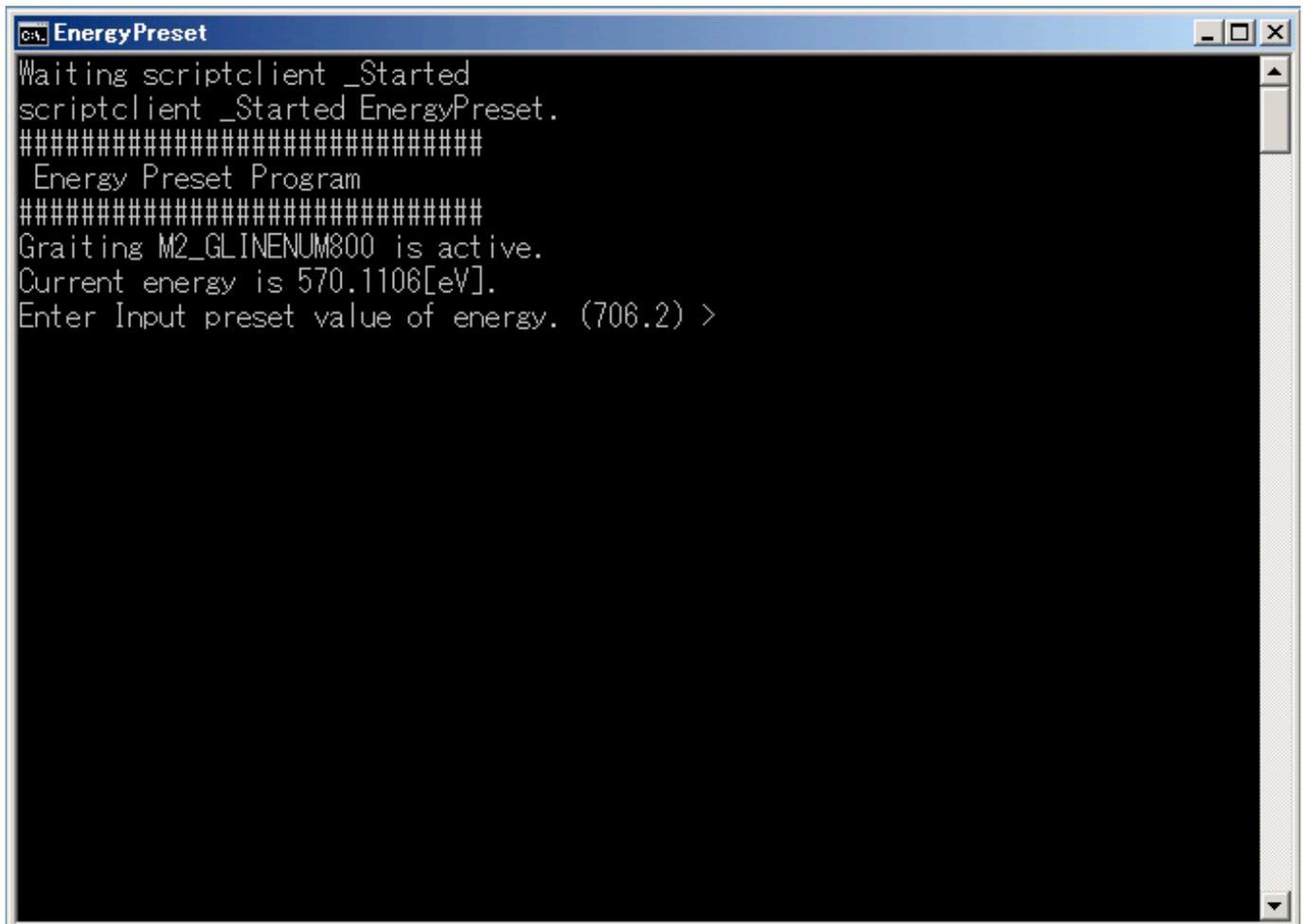
Open G&M1/M2 Select folder on the desktop and double-click Select\_M#\_G#00.

Exchange of the grating itself should be done manually.



## 5-2. Energy calibration

If you want to set photon energy to a certain standard, double-click 'EnergyPreset' at that point.



```
EnergyPreset
Waiting scriptclient _Started
scriptclient _Started EnergyPreset.
#####
Energy Preset Program
#####
Grafting M2_GLINENUM800 is active.
Current energy is 570.1106[eV].
Enter Input preset value of energy. (706.2) >
```