Procedure Manual for Measurement Software – Nov.30.2017 For Users

1.SAXS Measurement Methodology

- Select the "Measurement View" radio button on the PILATUS Monitor Software for Pilatus1(1M) at BL-6A, PILATUS Monitor Software for Pilatus1(2M) at BL-10C, or PILATUS Monitor Software for Pilatus1(2M) at BL-15A2 on the measurement PC.



- Determine the measurement conditions.

- For example, if you set the wavelength to 1.5 Å, the number of measurements to 1, and the exposure time to 5 seconds, input the following values into the PIRATUS Measurement Control Software.

Directory: Please enter the storage location for the files.

File prefix: Enter the word that will be used as a prefix for the files (e.g., test001).
File type: Choose between tif or cbf.
Monochromator control: Select 1.5 (auto-tune will perform a dTheta scan).
No. of Image: 1
Exp. time: 5
Exp. period: 5.01
Exp. delay: Do not enter any value.
Stop wait: 0.01
No. Cycle: 1

	PILATUS 1 OPILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
ilatus 1			Energy (eV) 8266
Directory	Z¥user¥test	Optional Settings	Gain autog
ile prefix	test001 File type tif cbf	Plot environment profiles to 1 file. Counter Output O Integration	
fonochrometer control	Energy Wavelength Change Change	Shutter Burst Mode ON OFF	Energy update
ko, images	1		
xp. time [sec]	5		
xp.period [sec]	5.01		
xp. delay [sec]			
Start wait [sec]	0.01] A: [Exp. Delay] B: [Exp. period] - [Exp. time	e]	
lo. cycle	1 Cycle interval [sec] 0.001 + A + B + 0		
Detector position	Fix Change Stage control		
) Manı Internal mode (al Pos. 1 Ver 0 Hor 0 Pos. 2 Ver 0 Hor 0 Single trigger mode Multi trigger mode External enable moc	de	
rilatus 2			
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Directory	Z¥ File type () tif () cbf		
Directory Tile prefix No, images			
Directory File prefix No, images Exp. time [sec]	File type tif cbf	<u> </u>	
Pilatus 2 Directory File prefix No, images Exp. time [sec] Exp. period [sec]	File type tif cbf		
Directory File prefix No, images Exp. time [sec] Exp. period [sec] Exp. delay [sec]	File type tif cbf		
Directory File prefix No, images Exp. time [sec] Exp. period [sec]	File type () tif cbf		
Virectory ille prefix lo, images box, time [sec] box, period [sec] box, delay [sec] start wait [sec] lo, cycle	File type tif cbf	e]	

- Press the "Run" button at the bottom left to start the measurement.

- In this case, the file name will be "test001_00000(number of measurements).tif" or "test001_00000(number of measurements).cbf". Tif files can be viewed anywhere, but cbf files have approximately three times the file size. To open cbf files, you will need the PIRATUS Monitor Software.

- To perform detector translation and merge the data from the GAP region of the PILATUS detector with another image, please continue with the following steps. The image data

merging can be achieved using the Synthesizer software for image data fusion.

- Select "change" from the Detector Position and then choose between "Auto" or "Manual." If you select "Manual," please input the Vertical (Ver.) and Horizontal (Hor.) values for Pos.1 and Pos.2.

PILATUS Measurement Control Software at Photon Factory		
File Option		
Detector PILATUS 1 PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
Pilatus 1 Directory Z¥user¥test File prefix test001 File type tif Monochrometer Energy Control 1.5 A auto tune No, images 1 Exp. time [sec] 5 Exp. period [sec] 5.01 Exp. delay [sec] 5 Start wait [sec] 0.01 A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle 1 Objector position Fix Objector position Fix Objector position Fix Objector position Pos.1 Ver Hor Outo Pos.2 Ver Hor O Ittranal mode Single trigger mode Multi trigger mode External enable mode	Optional Settings Plot environment profiles to 1 file. Counter Output Individual Shutter Burst Mode ON ON OFF	Energy (eV) 8266 Gain autog Energy update
Pilatus 2 Directory Z¥ File prefix File prefix Exp. time [sec] Exp. period [sec] Exp. delay [sec] Start wait [sec] No. cycle Images Images Images Images Images Exp. period [sec] Exp. delay [sec] Start wait [sec] Images Im		

- Press "Run" to start the measurement.

- The file name will be "test001_d0(detector position)_00000(number of measurements).tif"

or "test001_d0(detector position)_00000(number of measurements).cbf".

- Here is the description of the "Control program mode":

None: Select this option when manually opening and closing the shutter.

PILATUS with shutter control:

Choose this option when controlling the shutter from the PILATUS side.

SEC-SAX-UV measurement:

Select this option when using SEC-SAXA.

Single trigger mode:

Choose this option when conducting measurements in synchronization with an external trigger.

Single trigger mode serial shutter:

Select this option when conducting measurements in synchronization with an external trigger and controlling the shutter via serial communication. Single trigger mode no shutter:

> Choose this option when conducting measurements in synchronization with an external trigger and manually operating the shutter.

Not available:

This option is not available for use.

Here is the description of the "Optional Setting":

Plot environment profile to 1file:

Check this option if you want to consolidate the counter files into one file. Counter Output:

Choose between individual values (Individual) or integrated values (Integration) for the counter file.

Shutter Burst Mode:

This mode allows the shutter to open and close along with the exposure time. Normally, the shutter remains open during one measurement cycle, but by enabling Burst mode, the shutter can open and close within a single cycle, avoiding unnecessary exposure. This option is not available when the exposure period is less than 0.5 seconds. It is only applicable in the Single trigger mode.

2. WAXD Measurement Methodology

- Here, we assume that WAXD is already installed.

- Select the "Measurement View" radio button on the PILATUS Monitor Software for Pilatus2(100K) at BL-6A, PILATUS Monitor Software for Pilatus2(200K) at BL-10C, or PILATUS Monitor Software for Pilatus2(300KW) at BL-15A2 on the measurement PC.

PILATUS Monitor Softwa	are for Pilatus 2 (100K) at BL-6A
File Option	
💿 Live Viev 💿 Mesureme	nt View
	tart Stop
Image profile Auto color control Average method Simple average	- Image size: 487 x 195, Min: 0, Max: 36240, Bad pixels: 0 +
Manual color control Min: 0 ↓ Max: 36240 ↓ Ave: 18120 ↓ V Invert eray scale Scale: 100 ⊕ %	
Line profile Horizontal Vertical	
Please input the valid expo	sure time. [Pilatus 1]

- Determine the measurement conditions.

- For example, if you set the number of measurements to 1 and the exposure time to 30 seconds, input the following values into the PIRATUS Measurement Control Software.

Directory: Please enter the storage location for the files.

File prefix: Enter the word that will be used as a prefix for the files (e.g., test002).

File type: Choose between tif or cbf.

No. of Image: 1

Exp. time: 30

Exp. period: 30.01

Exp. delay: Do not enter any value.

Stop wait: Do not enter any value.

No. Cycle: 1

PILATUS Measurement Control Software at Photon Factory		_ 🗆 🛋
File Option		
Detector O PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information Energy (eV) 8266
Pilatus 1 Directory Z¥user¥test File prefix test001 File prefix test001 Monochrometer Energy control 1.5 Å auto tune No, images 1 Exp. time [sec] 5 Exp. time [sec] 5 Start wait [sec] 0.01 No. cycle 1 Optiester value 0.001 + A + B + 0 Detector position Fix © Auto Relative to Current © Auto Relative to Current © Manual Pos. 1 Pos. 2 Ver Hor 0	Optional Settings Plot environment profiles to 1 file. Counter Output Individual Individual Integration Shutter Burst Mode ON	Gain autog
Internal mode Single trigger mode Multi trigger mode External enable mode		
Pilatus 2 Directory Z¥user¥test		
File prefix test002 File type 💿 tif 💿 cbf		
No, images 1 🛬		
Exp. time [sec] 30		
Exp. period [sec] 30.01		
Exp. delay [sec]		
Start wait [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle 1 Image: Cycle interval [sec] 0.001 + A + B + 0		
No. cycle 1 🚖 Cycle interval [sec] 0.001 + A + B + 0		
Run Stop		
Ready to start.		.:

- Press "Run" at the bottom left to start the measurement.

- In this case, the file name will be "test002_00000(number of measurements).tif" or "test002_00000(number of measurements).cbf".

3. Measurement Method for Rotational Sample Changer

- Here, we assume that the rotational sample changer is already installed.

- Please click on "Stage Control" in the PILATUS Measurement Control Software at Photon Factory.

💀 PILATUS Measu	urement Control Software at Photon Factory		
File Option			
Detector	PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information Energy (eV) 8266
Pilatus 1 Directory File prefix Monochrometer control No, images Exp. time [sec] Exp. delay [sec] Start wait [sec] No. cycle Detector position I Auto Man	ual Pos. 1 Ver 0 Hor 0 Pos. 2 Ver 0 Hor 0	Optional Settings Plot environment profiles to 1 file. Counter Output Individual Integration Shutter Burst Mode ON Ø OFF	Energy (eV) 5200 Gain autos Energy update
Pilatus 2 Directory File prefix No, images Exp. time [sec] Exp. period [sec] Exp. delay [sec] Start wait [sec] No, cycle	Single trigger mode Multi trigger mode External enable mode Z¥ Image: Single trigger mode File type Image: Single trigger mode A: [Exp. Delay] B: [Exp. period] = [Exp. time] Cycle interval [sec] 0.001 + A + B + 0 Single trigger mode Multi trigger mode External enable mode Run Stop		

- Select "Use rotary sample changer" from the Stage type. Choose the measurement positions for the holes and click OK to close. The following is an example of measuring all the holes.

🖳 Sta	ge control					(barra)	Les Ret					
Selec	ct stage type	🔘 Unuse	stages									
		🔘 Use ro	otary sam	ple changer								
				ge scanning								
		🔘 Use gi	thetay s	can								
Rotar	y sample chan	nger										
Plea	ise check th	e postion.					+ Cł	neck all	– Unch	eck all		
	0:		V	9:	5000		18:	10000	V	27:	15000	
	1:	556	V	10:	5556	V	19:	10556		28:	15556	
	2:	1111	V	11:	6111	V	20:	11111	V	29:	16111	
	3:	1667	V	12:	6667		21:	11667		30:	16667	
	4:	2222	V	13:	7222	V	22:	12222		31:	17222	
	5:	2778	V	14:	7778	V	23:	12778	V	32:	17778	
	6:		V	15:		V	24:	13333	V	33:	18333	
	7:	3889	V	16:	8889	V	25:	13889	V	34:	18889	
	8:	4444	V	17:	9444	V	26:	14444		35:	19444	
				Ok		07	incel					
				<u>o</u> n								
Input	ok. 'Solution S	Stage control' e	enabled.	Click 'Ok' if	change the valu	es.						.::

- The "No. Cycle" will be automatically set according to the number of selected holes. The

measurements will be distinguished based on the sample position = Cycle number.

- Determine the measurement conditions.

- For example, if you set the wavelength to 1.5 Å, the number of measurements to 5, exposure time to 5 seconds, and the number of cycles to 36, input the following values.

Directory: Please enter the storage location for the files.

- File prefix: Enter the word that will be used as a prefix for the files (e.g., test001).
- File type: Choose between tif or cbf.
- Monochromator control: 1.5 (Selecting auto tune will perform dTheta scan.)
- No. of Image: 5
- Exp. time: 5
- Exp. period: 5.01
- Exp. delay: Do not enter any value.
- Stop wait: 0.01
- No. Cycle: 36

PILATUS Measurement Control Software at Photon Factory								
File Option								
Detector	PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information Energy (eV) 8266					
Pieces Directory File prefix Monochrometer control No, images Exp. trine (sec) Exp. period (sec) Start wait (sec) No, cycle Detector position		Optional Settings Plot environment profiles to 1 file. Counter Output Individual Shutter Burst Mode ON	Energy (eV) 6260 Gain autog Energy update					
Pilatus Indee Pilatus 2 Directory File prefix No, innages Exp. time [sec] Exp. delay [sec] Start wait [sec] No. cycle @ Internal mode	Z¥ Bile type () tif cbf A: [Exp. Delay] B: [Exp. period] - [Exp. time]							

- Press "Run" in the PILATUS Measurement Control Software at Photon Factory to start the measurement. The file name will be "test001_00(hole position)_00000(number of measurements).tif" or "test001_00(hole position)_00000(number of measurements).cbf".

- If you want to move the detector translationally, continue with the following steps.

- Select "change" from the Detector position and then choose between "Auto" or "Manual." If you select "Manual," please input the Vertical (Ver.) and Horizontal (Hor.) values for Pos.1 and Pos.2.

PILATUS Measurement Control Software at Photon Factory		
File Option		
Detector	Control program mode Pilatus with shutter control	Energy Information
	Control program mode Pilatus with shutter control Optional Settings Plot environment profiles to 1 file. Counter Output Individual Shutter Burst Mode ON OFF	Energy Information Energy (eV) 8206 Gain autog Energy update
) 💿 Internal mode 💿 Single trigger mode 💿 Multi trigger mode 💿 External enable mode		
Run Stop		
Ready to start.		

- Press the "Run" button to start the measurement.

- The file name will be "test001_00 (hole position)_d0 (translation position)_00000 (number of measurements).tif" or "test001_00 (hole position)_d0 (translation position)_00000 (number of measurements).cbf".

4. Measurement method for sample stage scan.

- Please click on "Stage Control" from the PILATUS Measurement Control Software at Photon Factory.

File Option Detector Platus 1 Platus 1 </th <th>File Option Detector PIATUS 1 PIATUS 1 and 2 Control program mode Pileaus with shutter control Energy information Pileaus 1 Detectory Z4user¥test Pile my information Energy (6V) 6206 Gain autog Pileaus 1 Detectory Z4user¥test Pile my information Energy (6V) 6206 Gain autog No. images 5 • Pile my information Energy update Energy update No. images 5 • • Indeparting Energy update No. images 5 • • Indeparting Energy update No. images 5 • • Noto Piles to courset Energy update No. cycle I C Option interval [sec] 0001 + A + B + 0 Optional Piles to courset Pilesto to Current Pilesto pilesto to Current Pilest</th> <th>PILATUS Measurement Control Software at Photon Factory</th> <th></th> <th>_ 0 _X</th>	File Option Detector PIATUS 1 PIATUS 1 and 2 Control program mode Pileaus with shutter control Energy information Pileaus 1 Detectory Z4user¥test Pile my information Energy (6V) 6206 Gain autog Pileaus 1 Detectory Z4user¥test Pile my information Energy (6V) 6206 Gain autog No. images 5 • Pile my information Energy update Energy update No. images 5 • • Indeparting Energy update No. images 5 • • Indeparting Energy update No. images 5 • • Noto Piles to courset Energy update No. cycle I C Option interval [sec] 0001 + A + B + 0 Optional Piles to courset Pilesto to Current Pilesto pilesto to Current Pilest	PILATUS Measurement Control Software at Photon Factory		_ 0 _X
Pilatua 1 Directory Z4userViest File prefix test001 File type tif control 15 A auto ture No. innege Exp. time [sec] Sol1 Exp. delay [sec] Sol1 Exp. delay [sec] No. vocke Pos. 1 Ver 0 Hor 0 No. innege Auto Pos. 1 Ver 0 Hor 0 No. innege Cycle interval [sec] 0.001+ A + B + 0 Pos. 1 Ver 0 Hor 0 Pos. 2 Ver 0 Hor 0 Plantaria Pos. 2 Ver 0 Hor 0 Pos. 2 Ver 0 E	Platue 1 Directory Z4userHest File prefix tett001 File prefix tetto Start wait [sec] Optional Stattment Pos. 1 Very Device Pos. 2 Wolde Pos. 1 Very Device Pos. 2 Wolde Pos. 2 Wolde Pos. 2 Wolde Pos. 2 Wolde Pos. 1 Very Device Pos. 2 Wolde Pos. 1 Very Device Pos. 2 Wolde Pos. 1 Very Device Pos. 2 Wolde D			
Pilatus 1 Directory 2NuserWest File prefix Est001 File prefix Energy @ Wavelength control 15 Å auto tune No. inaece 5 Exp. ening [sec] 501 Exp. ening [sec] 0001 + A + B + 0 Detector position Plative to Current Manual Pos. 1 Ver Plattrey File type @ tif @ cbf No. inaecs Plattrey Exp. time [sec] Single control Plattrey File type @ tif @ cbf No. inaecs Plattrey Exp. time [sec] A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle Plattrey Plattrey File type @ tif @ cbf No. inaecs Plattrey Exp. period [sec] Exp. period [sec] Exp. period [sec] A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle Cycle interval [sec] Output A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle Cycle interval [sec] Start wait [sec] A [Exp	Piettur 1 Drectory 2*NoerWest Die protix Estop File protix Estop No, inages 5 Esp, time [sc] 5 Esp, delay [scd] 501 Start wait [scd] 0.01 A (Esp, Delay) B (Exp, period) - (Exp, time) No, cycle I + Corrent No, cycle I + Corrent No, cycle I + Corrent Outer output 0 Anto Pos. 2 Ver 0 Hore made Single trigger mode Post trigger mode Multi trigger mode Esp, delay [sec] Single trigger mode Esp, tene [scd] File trigger mode Post trigger mode Multi trigger mode Esp, tene [scd] File trigger mode Esp, tene [scd] Oycle interval [scd] Optional Start wait [scd] A (Esp, Delay) B (Esp, period) - (Esp, time) No. worke Post trigger mode Post trigger mode Multi trigger mode Esp, tene [scd] Oycle interval [scd] Optional Start wait [scd] A (Esp, Delay) B (Esp, period) - (Esp, time) No. worke Poycle interval [scd] Option all wait trigger mode Multi trigger mode <t< th=""><th>Detector PILATUS 1 PILATUS 1 and 2</th><th>Control program mode Pilatus with shutter control</th><th></th></t<>	Detector PILATUS 1 PILATUS 1 and 2	Control program mode Pilatus with shutter control	
Directory Z4 File prefix File type () tif () cbf No, images I) Exp, time [sec] I) Exp, period [sec] I) Exp, delay [sec] I) Start wait [sec] I) No, cycle I) III Cycle interval [sec] 0.001 + A + B + ()	Directory Z¥ File prefix File type () tif () cbf No, images () Exp. time [sec] () Exp. delay [sec] () Start wait [sec] () No. cycle () Cycle interval [sec] 0.001 + A + B + () () Internal mode Single trigger mode External enable mode	Directory Z¥user¥test File prefix test001 File type tif control File prefix test001 File type tif control File prefix test001 File type time [sec] file prefix tune File prefix time [sec] File prefix time [sec] File prefix time [sec] File	Plot environment profiles to 1 file. Counter Output	Gain autog
Run Stop	Asadu to start	Pilatus 2 Directory Z¥ File prefix File		

- In "Select Stage type," choose "Use sample stage scanning." Input the scan range, step, and direction.

- In the following example, vertical scanning will be conducted at 9 positions, with a step size of 0.1mm, ranging from (-0.1mm, -0.1mm) to (0.1mm, 0.1mm).

🖳 Stage control										
Select stage type		O Unuse stages								
	O Use rotary sample changer									
	● Use sam ○ Use gitł		canning							
	O OSE SI U	ietay seari								
Sample stage scanning										
Please input the abs	solute value	e to each j	position.							
	Start. End. Step count. per step.									
Stage vertical pos.	mm	-0.1	0.1	3	0.1					
Stage horizontal pos.	mm	-0.1	0.1	3	0.1					
		Num	nber of cycle	es 9						
Scan direction	 Vertical 	first	¢) Horizontal	first					
Sample stage scanning Please input the abs Stage vertical pos. Stage horizontal pos. Scan direction		Ok			Can					
Input ok. 'Stage control	' enabled. Cli	ick 'Ok' if ch	nange the va	alues.						

- The "No. Cycle" will be automatically set according to the selected Step count.

- Determine the measurement conditions.

- For example, if you set the wavelength to 1.5 Å, the number of measurements to 10 frames, and an exposure time of 5 seconds for 9 cycles, enter the following values.

Directory: Please input the destination for storing files.

File prefix: The word that will be at the beginning of the file (e.g., test002).

File type: Select either tif or cbf.

Monochromator control:

Choose 1.5 (auto-tuning will perform a dTheta scan).

No. of Image: 10 Exp. time: 5 Exp. period: 5.01 Exp. delay: Do not input. Stop wait: 0.01 No. Cycle: 9

PILATUS Measurement Control Software at Photon Factory		_ D _X
File Option		
Detector PILATUS 1 PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information Energy (eV) 8266
Pilatus 1	Optional Settings	Gain autog
Directory Z¥user¥test	Plot environment profiles to 1 file.	
File prefix test001 File type 💿 tif 🔿 cbf	Counter Output 💿 Individual 🔘 Integration	
Monochrometer Energy Wavelength Change Change	Shutter Burst Mode 🔿 ON 💿 OFF	Energy update
No, images 5		
Exp. time [sec] 5		
Exp. period [sec] 5.01		
Exp. delay [sec]		
Start wait [sec] 0.01 A: [Exp. Delay] B: [Exp. period] - [Exp. time]		
No. cycle 9 🔄 Cycle interval [sec] 0.001 + A + B + 0 🦯		
Detector position Fix Change Stage control		
Auto Relative to Current Manual Pos. 1 Ver Hor Pos. 2 Ver Hor O Hor O Hor O Internal mode Single trigger mode Multi trigger mode External enable mode		
Pilatus 2		
Directory Z¥		
File prefix File type () tif () cbf		
No, images		
Exp. time [sec]		
Exp. period [sec]		
Exp. delay [sec]		
Start wait [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time]		
No. cycle 🔄 Cycle interval [sec] 0.001 + A + B + 0		
. @ Internal mode ○ Single trigger mode ○ Multi trigger mode ○ External enable mode		
Run Stop		
Ready to start.		.:

- Press "Run" in the PILATUS Measurement Control Software at Photon Factory to start the measurement. The file name will be "test001_00 (measurement position)_00000 (number of measurements).tif" or "test001_00 (measurement position)_00000 (number of measurements).cbf".

- If you want to perform detector translation, continue with the following steps.

- Select "change" from Detector position, and then choose either "Auto" or "Manual." If you select "Manual," please input Ver. and Hor. for Pos.1 and Pos.2.

PILATUS Measurement Control Software at Photon	actory				_ D X
File Option					
Detector PILATUS 1 F	ILATUS 1 and 2	Control program mode	Pilatus with shutter contr	ol 🔹	Energy Information
No. cycle 9 Cycle interval [sec] Detector position Fix OChange Auto Feiatrive to Curre Manual Pos. 1 Ver 0 Hor 0 Pos. 2 Ver 0 Hor 0	Change B: [Exp. period] - [Exp. time] 0.001 + A + B + 0 Stage control	Optional Settings Plot environment profile Counter Output Shutter Burst Mode	es to 1 file. ◎ Individual ○ Integ ○ ON ◎ OFF	ration	Energy (eV) 8266 Gain autog Energy update
Pilatus 2 Directory Z¥ File prefix File type @ No, images ÷ Exp. time [sec] Exp. period [sec] Exp. delay [sec] Start wait [sec] A: [Exp. Delay]	tif cbf B: [Exp. period] - [Exp. time] 0.001 + A + B + 0				

- Press "Run" to start the measurement.

- The file name will be "test001_00 (measurement position)_d0 (translation position)_00000 (number of measurements).tif" or "test001_00 (measurement position)_d0 (translation position)_00000 (number of measurements).cbf".

5.Measurement method for the GI stage.

- Here, we will explain assuming that the GI stage has already been installed.

- Determine the measurement conditions.

- For example, if you set the wavelength to 1.5 Å, the number of measurements to 5 frames, and an exposure time of 5 seconds for 1 cycle, enter the following values.

Directory: Please enter the storage location for files.

File prefix: The word that will be at the beginning of the file (e.g., test001).

File type: Select either tif or cbf.

Monochromator control:

Choose 1.5 (selecting auto tune will perform a dTheta scan).

No. of Image: 5

Exp. time: 5 Exp. period: 5.01 Exp. delay: Do not input. Stop wait: 0.01 No. Cycle: 1

PILATUS Measurement Control Software at Photon Factory		
File Option		
Detector PILATUS 1 PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
	Control program mode Pilatus with shutter control Optional Settings Plot environment profiles to 1 file. Counter Output Individual Integration Shutter Burst Mode ON	Energy Information Energy (eV) 8266 Gain autos Energy update
Start wait [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle Oycle interval [sec] 0.001 + A + B + 0 Image: Single trigger mode Multi trigger mode External enable mode		
Run Stop		
Ready to start.		.:!

- Press "Run" in the PILATUS Measurement Control Software at Photon Factory to start the measurement. The file name will be "test001_00000 (number of measurements).tif" or "test001_00000 (number of measurements).cbf".

- Measurement while varying ThetaY is performed using the following steps.

- Please click on "Stage Control" in the PILATUS Measurement Control Software at Photon Factory.

File Option Detector P PLATUS 1 PLATUS 1 and 2 Directory Zwarewheet Directory Zwarewheet File prefx test001 File prefx test001 Exp. testelso Directory Exp. testelso Energy level Control program mode Platus mith shutter control Directory Zwarewheet File prefx test001 Platus mess Image: Solution S	PILATUS Measurement Control Software at Photon Factory		
Plintual Coptional Settings Directory 24/userWest File prefix est001 File prefix state state Exp. time [see] 5 Exp. time [see] 5 Exp. time [see] 5 State wait [see] 001 + A + B + Detectory position File prefix Moraul Pos. 1 Var Hora State wait [see] A [Exp. Delay] B [Exp. prixd] - [Exp. time] No. invaes File prefix File prefix File type @ tif _ cbf No. invaes File prefix File prefix File type @ tif _ cbf No. invaes G Exp. time [sec] A [Exp. Delay] B [Exp. prixd] - [Exp. time] No. cycle Cycle interval [sec] 001 + A + B + 0 <t< td=""><td></td><td></td><td></td></t<>			
Piletars Directory ZWareWet Directory ZWareWet Directory Energy Wavelength Control 15 A auto ture No. images 5 Exp. trie [sed] 5.01 Exp. delso [sed] 5.01 Start wai [sed] 0 Nuto Pos.1 Ver Hor Pos.2 Ver Hor Porectory ZW File prefix Porectory ZW File prefix File prefix Pos.1 Ver Hor Pos.2 Ver Hor Porectory ZW File prefix Porectory ZW File prefix Pos.1 Ver Hor Porectory ZW File prefix Pos.1 Ver Hor Pos.2 Ver Hor Directory ZW File prefix Pos.1 Ver Hor Pos.1 Ver Hor Pos.1 Ver Hor Directory ZW File prefix Pos.1 Ver Hor Directory </td <td>Detector O PILATUS 1 O PILATUS 1 and 2</td> <td>Control program mode Pilatus with shutter control</td> <td></td>	Detector O PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	
Platus 2 Directory Z¥ File prefix File type (a) tif No, images Image: Comparison of the state of the	Directory Z¥user¥test File prefix test001 File type @ tif C cbf Monochrometer control 1.5 Å auto tune No, images 5 Exp. time [sec] 5 Exp. period [sec] 5.01 Exp. delay [sec] 0.01 A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle 11 Cycle interval [sec] 0.001 + A + B + 0 Detector position @ Fix Change @ Auto Relative to Current Manual Pos. 1 Ver 0 Hor 0	Plot environment profiles to 1 file. Counter Output	Gain autos
Exp. period [sec] Exp. delay [sec] Start wait [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle Cycle interval [sec] 0.001 + A + B + 0 Image: Organization of the start of	Pilatus 2 Directory Z¥ File prefix File type (a) tif cbf		
Run Stop	Exp. period [sec] Exp. delay [sec] Start wait [sec] No. cycle Exp. delay [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time] Out of the second secon		
Ready to start.			

- In "Select Stage type," choose "Use gi thetay scan." The following screen is an example of scanning from -0.1° to -1° in steps of 0.01° . For "per Step," indicate the scanning direction by adding a minus sign, and input up to three decimal places in this case. Close with OK.

🖷 Stage control		_	×
Select stage type	 Unuse stages Use rotary sample changer Use sample stage scanning Use gi thetay scan Use custom scan 		
GI thetaY scan Please input the	absolute value to each position.		
GI thetaY	Start. End. per Step Count. deg -0.1 -1 -5.010 91		
	Number of cycles 91		
	Ok		
nput ok. 'Stage contro	I' enabled. Click 'Ok' if change the values.		

- Press "Run" to start the measurement.

PILATUS Measurement Control Software at Photon Factory		_ 🗆 📈
File Option		
,		
Detector PILATUS 1 PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
Pilatus 1 Directory Z¥user¥test File prefix test001 File type tif Change Change No, images 5 Exp, time [sec] 5 Exp, time [sec] 5 Exp, delay [sec] 5 Start wait [sec] 0.01 A: [Exp, Delay] B: [Exp, period] - [Exp, time No. cycle 10 Cycle interval [sec] 0.01 + A + B + 0 Detector position ● Fix Change Stage control ● Auto Pos.1 Ver 0 Hor ● Pos.2 Ver 0 Hor 0	Counter Output Individual Integration Shutter Burst Mode ON OFF	Energy (eV) 8266 Gain autog Energy update
Internal mode Single trigger mode Multi trigger mode External enable mod Filatus 2 Directory Z¥	_	
File prefix File type (a) tif cbf No, images (a) Exp. time [sec] Exp. period [sec]		
Exp. delay [sec] Start wait [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. tim No. cycle Cycle interval [sec] 0.001 + A + B + 0 Internal mode External enable mode Internal mode		
Run Stop		

- For the given case, the output file name will be "test001_00 (measurement position)_00000 (number of measurements).tif" or "test001_00 (measurement position)_00000 (number of measurements).cbf".

- If you want to perform detector translation, continue with the following steps.

- Select "change" from Detector position, and then choose either "Auto" or "Manual." If you select "Manual," please input Ver. and Hor. for Pos.1 and Pos.2.

PILATUS Measure	ement Control Software at Photon Factory		_ 0 _X
File Option			
Detector	PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
Pilatus 1		Optional Settings	Energy (eV) 8266
Directory	Z¥user¥test	Plot environment profiles to 1 file.	Gain autog
File prefix	test001 File type (a) tif (C) cbf	Counter Output	
	Energy Wavelength Change	Shutter Burst Mode 💿 ON 💿 OFF	Energy update
control	1.5 Å 📄 auto tune]	I
No, images	5		
Exp.time [sec]	5		
Exp. period [sec] Exp. delay [sec]	5.01		
Exp. delay [sec] Start wait [sec]	0.01 A: [Exp. Delay] B: [Exp. period] - [Exp. time]		
No. cycle	10		
Detector position	○ Fix		
i Auto	Relative to Current I Pos. 1 Ver 0 Hor 0 I Pos. 2 Ver 0 Hor 0		
💿 Internal mode 🔘	Single trigger mode 🔘 Multi trigger mode 🔘 External enable mode		
Pilatus 2			
1	Z¥		
File prefix	File type		
No, images Exp. time [sec]			
Exp. time [sec] Exp. period [sec]			
Exp. delay [sec]			
Start wait [sec]	A: [Exp. Delay] B: [Exp. period] - [Exp. time]		
No. cycle	Cycle interval [sec] 0.001 + A + B + 0		
🍥 Internal mode 🔵	Single trigger mode 🔘 Multi trigger mode 🔵 External enable mode		
ſ			
	Run Stop		
Ready to start.			.:

- Press "Run" to start the measurement.

- The file name will be "test001_00 (measurement position)_d0 (translation position)_00000 (number of measurements).tif" or "test001_00 (measurement position)_d0 (translation position)_00000 (number of measurements).cbf".

- The file name will be "test001_00 (measurement position)_d0 (translation position)_00000 (number of measurements).tif" or "test001_00 (measurement position)_d0 (translation position)_00000 (number of measurements).cbf".

6. Measurement while changing the wavelength.

- Normally, the wavelength or energy values of the Monochromator Scan Software and the measurement software are matched.

- When performing measurements while changing the wavelength, please click on "Change" in the measurement software.

PILATUS Measurement Control Software at Photon Factory		— — X
File Option		
Detector		nformation eV) 8265 *
Pilatus 1 Directory Z¥user¥Noda¥20171129¥ScAtg11C-MBP File prefix MBPScAtg11C File prefix MBPScAtg11C File type tif Monochrometer Energy control 1.5 Å auto tune No, images 225 Exp. time [sec] 20 Exp. delay [sec] 0 Start wait [sec] 0 A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle 1 Detector position Fix Change Stage control @ Auto Relative to Current Manual Pos. 1 Ver Pos. 2 Ver Hor	Optional Settings Gain Image: Plot environment profiles to 1 file. Counter Output Counter Output Individual	ergy update
● Internal mode Single trigger mode Multi trigger mode External enable mode Pilatus 2 Directory Z¥user¥Nakagawa¥20171115¥rawWAXD_2¥PTE-200HS_1 Directory Z¥user¥Nakagawa¥20171115¥rawWAXD_2¥PTE-200HS_1 File prefix f File type No, images 360 ⊕ Exp. time [sec] 14 Exp. period [sec] 15 Exp. delay [sec] 0 Start wait [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle 1		

- Check the "Enable range scan" option in the Monochromator control range input, and input the desired values for changing the wavelength or energy.

🖶 Monocrh	ometer	control range	input				<u>x</u>
🔽 Enable ra	inge scan						
🔘 Energy		() Wavelength					
	1.5 -	1.55 4	🔾 / Step	0.01	Å	📃 auto tune	
		Ok		Car	ncel		
Input ok. 'R	ange inp	out' enabled. Cl	ick 'Ok' if ch	ange the	valu	Jes.	:

- Selecting "auto tune" will perform a dTheta scan.

7.Restart procedure.

- If an error occurs during measurement with PILATUS and image data recording is no longer functioning, please follow the steps below to restart.

- Please click on the "PILATUS manager" that is running on the taskbar of the measurement



- When the Command Prompt window opens, please click the "X" in the upper right corner to close it.

🕎 PILATUS Manager
[2017-07-10 15:38:51,033][starsbridge] stbrpilatus>ct081mac @IsBusy Er: ct081 is A
down. [2017-07-10 15:38:58.755][starsbridge] stbr.System>System_alive [2017-07-10 15:38:58.755][starsbridge] stbrpilatus.System>System_alive [2017-07-10 15:39:01,610][starsbridge] [stbrpilatus] ct081mac>stbrpilatus.ct081 bello
nerio [2017-07-10 15:39:01,610][starsbridge] [stbr] stbr.ct081mac>ct081 hello [2017-07-10 15:39:01,610][starsbridge] stbr.ct081mac>ct081 hello [2017-07-10 15:39:01,610][starsbridge] [stbr] System>stbr.ct081mac @hello Er: ct 081 is down.
[2017-07-10 15:39:01,610][starsbridge] [stbrpilatus] stbrpilatus>ct081mac @hello
Er: ct081 is down. [2017-07-10 15:39:01,610][starsbridge] stbrpilatus>ct081mac @hello Er: ct081 is
down. [2017-07-10 15:39:01,610][starsbridge] [stbrpilatus] ct081mac>stbrpilatus.ct081
IsBusy [2017-07-10 15:39:01,610][starsbridge] [stbr] stbr.ct081mac>ct081 IsBusy [2017-07-10 15:39:01,610][starsbridge] stbr.ct081mac>ct081 IsBusy [2017-07-10 15:39:01,626][starsbridge] [stbr] System>stbr.ct081mac @IsBusy Er: c
t081 is down. [2017-07-10 15:39:01,626][starsbridge] [stbrpilatus] stbrpilatus>ct081mac @IsBus
y Er: ct081 is down. [2017-07-10 15:39:01,626][starsbridge] stbrpilatus>ct081mac @IsBusy Er: ct081 is down.

- Please click the "VNC" icon from the taskbar or desktop to launch it.



- In the case of SAXS, in the "VNC Server" field, enter either "172.16.0.4@BL-6A",

"172.16.0.71@BL-10C", or "172.16.0.2@BL-15A2". For WAXD, enter either

"172.16.0.6:1@BL-6A", "172.16.0.73@BL-10C", or "172.16.0.3@BL-15A2". Then, click "Connect".

- The window "det@datXXX-VNC Viewer" will be launched. On the screen, you will see the Display Window to show PILATUS images, along with two terminals for "camserver" and "tvx," and an additional terminal running in the background.

PC.



- There is an error message displayed in the "camserver" terminal's log. (The "camserver" terminal itself might have crashed due to an error.)

- Please click the "X" in the upper right corner of the "camserver" and "tvx" terminals to close them. Also, close the Display Window for "image_000XX.tif".

- There is only one terminal remaining on the screen.

- To check the current directory, please type "ls" and press Enter.

- If the directory is not "p2_det," please type "cd p2_det" and press Enter to navigate to the "p2_det" directory.

- The last line in the terminal.

det@detXXX:~/p2_det>

So, type "runtvx" on the keyboard and press Enter to execute it.

- When you execute "runtvx," two terminals for "camserver" and "tvx" will be launched. Eventually, the Display Window for PILATUS showing "image_000XX.tif" will also be displayed. Additionally, in the "tvx" terminal, you will see:

disconnect

*

- The restart of the server program is now complete.

- Please click on "PILATUS Manager" located on the desktop of the measurement PC to launch it. Upon launching, an icon will appear on the taskbar.



- Please confirm that you can successfully perform measurements in the PIRATUS Monitor Software by testing in Live mode with Exp.time set to 1 second and 10 seconds, among other settings.



An example of BL-6A.