

Changing X-Box Settings

This presentation is designed to provide a step-by-step followthrough. If you have any questions, do not hesitate to contact us.

Make sure you do not overwrite existing energy and preset options associated with calibrations. Only edit settings you are comfortably having changed. Calibrations will not function if you are collecting data with different energy and current than your reference standards.

Changing X-Box Settings

The Tracer series employs a 4 watt bulb. Your energy multiplied by your current will equal the wattage you are using.

NEVER GO ABOVE 4 WATTS - THIS WILL DESTROY YOUR TUBE.

It is strongly recommended that you keep settings below 1.5 watts, this will lengthen the life of your tube.

Changing X-Box Settings

To calculate your wattage, multiply energy by current.

For example, $40 \text{ keV} \times 30 \text{ } \mu\text{A} = 1200 = 1.2 \text{ watts}$

$15 \text{ keV} \times 25 \text{ } \mu\text{A} = 375 = 0.375 \text{ watts}$

Changing X-Box Settings

Finally, before beginning any changes to your X-box settings, record all existing settings - at minimum take a screenshot of the computer screen when you first load your Tracer's settings so that if a mistake is made, you can re-input all of the original factory presets.

Changing X-Box Settings

When you first open up X-Ray Ops, the screen will be blank

Windows 8.1 Pro
Build 9600
10:38 PM
6/10/2014

Changing X-Box Settings

First, enter in the com port number the Tracer is plugged into

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Changing X-Box Settings

The screenshot shows a Windows 8.1 desktop with a yellow-green background. In the foreground, a window titled 'Broker AXS Handheld Inc. Tube Settings / Monitor' is open, displaying various settings like 'Comm Port #', 'High Speed Comms', and 'Version: 1.2.21'. Below it, the 'Devices and Printers' control panel window is open, showing a list of devices. A callout box with a black border and white background contains the text: 'You can find this information in 'Devices and Printers' in the Start Menu or Control Panel'. A black arrow points from the callout box to a device icon labeled 'Prolific USB-to-Serial Comm Port (COM9)'. Other devices visible include 'DUCK', 'Fax', 'Microsoft XPS Document Writer', 'Send To OneNote 2010', and 'Serial Adaptor'. The system tray in the bottom right corner shows 'Windows 8.1 Pro Build 9600', the time '10:38 PM', and the date '6/10/2014'.

Version: 1.2.21

Control Panel > All Control Panel Items > Devices and Printers

Add a device Add a printer Remove device

VITO-TOSHIBA2

Printers (4)

DUCK Fax Microsoft XPS Document Writer Send To OneNote 2010

Unspecified (2)

Prolific USB-to-Serial Comm Port (COM9) Serial Adaptor

Prolific USB-to-Serial Comm Port (COM3) Model: USB-Serial Controller Category: Unknown

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Changing X-Box Settings

Next, select High Speed Communications if you have a Tracer IIIV+ or newer

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	167
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	0
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	0.00
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	206
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	8
	167	206	40 kV	11 μ A	<input checked="" type="checkbox"/>	200	1	4095

Pulse Length 200 Auto Mode Skip reread
Pulse Period 254 Tube Enabled Re-Read Settings Update Settings Start Update Actuals Monitor Actuals

Log Data to File: _____ Start Logging
Script File: _____ Start Script

Firmware to Upload: _____ Upload Firmware

ADC/DAC Version: _____

Actual HVG DAC 167
HVG Current (mA) 0
Anode Current (μ A) 0.00
Actual FG DAC 206
FG Current (mA) 8
Anode diode 4095
Cathode diode 137
Input Voltage 14.4
Input Current 21
Pulse Length 200
Temp. 26.1
Filter 0
Flux 0
IR LED 4095
Vacuum 723

You will see your Tracer's X-box settings

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	167
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	0
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	0.00
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	206
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	8
	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	4095

Pulse Length 200 Auto Mode
Pulse Period 254 Tube Enabled

Log Data to File:
Script File:

Firmware to Upload:

ADC/DAC Version:

Skip reread PC Trigger

Re-Read Settings Update Settings Start Update Actuals Monitor Actuals Start Logging Start Script Upload Firmware

Actual HV (kV) 0.05
Actual HVG DAC 167
HVG Current (mA) 0
Anode Current (μ A) 0.00
Actual FG DAC 206
FG Current (mA) 8
Anode diode 4095
Cathode diode 137
Input Voltage 14.4
Input Current 21
Pulse Length 200
Temp. 26.1
Filter 0
Flux 0
IR LED 4095
Vacuum 723

Take a screen shot or record these settings - if anything goes wrong, you can re-input these factory defaults by hand.

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 167
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 0
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 0.00
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 206
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	FG Current (mA) 8
	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	Anode diode 4095

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled Re-Read Settings Update Settings Start Update Actuals Monitor Actuals Start Logging Start Script Upload Firmware

Log Data to File: Script File: Firmware to Upload: ADC/DAC Version: 0.1.1.2

Actual HV (kV) 0.05
Actual HVG DAC 167
HVG Current (mA) 0
Anode Current (μ A) 0.00
Actual FG DAC 206
FG Current (mA) 8
Anode diode 4095
Cathode diode 137
Input Voltage 14.4
Input Current 21
Pulse Length 200
Temp. 26.1
Filter 0
Flux 0
IR LED 4095
Vacuum 723

These are the data stored in your Tracer - editing here will change the internal settings of your Tracer unit

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	167
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	0
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	0.00
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	206
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	8
	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	4095

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled

Re-Read Settings Update Settings Start Update Actuals Monitor Actuals Start Logging Start Script

Log Data to File: Script File: Firmware to Upload: ADC/DAC Version:

Actual HV (kV) 0.05
Actual HVG DAC 167
HVG Current (mA) 0
Anode Current (μ A) 0.00
Actual FG DAC 206
FG Current (mA) 8
Anode diode 4095
Cathode diode 137
Input Voltage 14.4
Input Current 21
Pulse Length 200
Temp. 26.1
Filter 0
Flux 0

Clicking 'ReRead Settings' will re-import these X-box settings if you have problems

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Changing X-Box Settings

The first column to the far left includes your input voltage settings

The screenshot displays the Bruker AXS Handheld software interface. The main window is titled "Read and Set filter layers" and "Bruker AXS Handheld In". It features a table of filter settings and various control buttons. A callout box points to the "High Voltage Settings" column, which includes input voltage values for five filters.

Filter	High Voltage Settings	Filament Current	High Voltage
Light Pipe	107	224	15 kV
Filter #1	198	222	40 kV
Filter #2	198	222	40 kV
Filter #3	223	228	40 kV
Filter #4	103	222	15 kV
Filter #5	167	206	40 kV

Additional settings visible include:

- Comm Port #: 9
- High Speed Comms:
- Open XRay Comm Port:
- HandShake:
- Pulse Length: 200
- Pulse Period: 254
- Auto Mode:
- Tube Enabled:
- Re-Read Settings:
- Update Settings:
- Start:
- Update Actuals:
- Monitor Actuals:
- Log Data to File:
- Script File:
- Start Logging:
- Start Script:
- Firmware to Upload:
- Upload Firmware:

Actual values on the right side of the interface:

- Actual FG DAC: 206
- FG Current (mA): 8
- Anode diode: 4095
- Cathode diode: 137
- Input Voltage: 14.4
- Input Current: 21
- Pulse Length: 200
- Temp.: 26.1
- Filter: 0
- Flux: 0
- IR LED: 4095
- Vacuum: 723

The desktop background shows a green fern leaf. The taskbar at the bottom includes icons for Internet Explorer, File Explorer, and the Bruker AXS software. The system tray shows the time as 10:40 PM on 6/10/2014 and the system version as Windows 8.1 Pro, Build 9600.

Changing X-Box Settings

The second column to the right includes the filament current settings

The screenshot displays the Bruker AXS Handheld Inc. Tube Settings software interface. The window title is "Read and Set filter layers" and "Bruker AXS Handheld Inc. Tube Settings". The interface includes a table for filter settings with columns for High Voltage Settings, Filament Current Settings, and High Voltage Settings. A callout box points to the Filament Current Settings column. The interface also includes various input fields, checkboxes, and buttons for configuration and monitoring.

Filter	High Voltage Settings	Filament Current Settings	High Voltage Settings
Filter #1	198	222	40 kV
Filter #2	198	222	40 kV
Filter #3	223	228	40 kV
Filter #4	103	222	15 kV
Filter #5	167	206	40 kV

ADC/DAC Version: 0.1.1.2

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Changing X-Box Settings

The third column to the left includes the voltage preset - this is your target energy

The screenshot displays the 'Bruker AXS Handheld Inc. Tube Settings / Monitor' application. The interface is divided into several sections:

- High Voltage Settings:** Includes a table with columns for High Voltage (kV) and Filament Current (µA).
- Filament Current Settings:** Includes a table with columns for Filament Current (µA) and High Voltage (kV).
- High Voltage ADC Presets:** A table with columns for High Voltage (kV), Filament Current (µA), and a numerical value (likely the target energy). A callout box points to this column.
- Actuals:** A table showing real-time measurements for parameters like Actual FG DAC, FG Current (mA), Anode diode, Cathode diode, Input Voltage, Input Current, Pulse Length, Temp., Filter, Flux, IR LED, and Vacuum.

The software is running on a Windows 8.1 Pro desktop. The taskbar shows the Start button, Internet Explorer, File Explorer, and the Bruker logo. The system tray in the bottom right corner displays the date and time: 10:40 PM, 6/10/2014.

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Comm Port # 9 High Speed Comms Times 2 Extended Actuals Vers

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current	Actual HVG	HVG Current
Filter #1	107	224	15 kV	29 µA	200	2	
Filter #2	198	222	40 kV	30 µA	200	1	
Filter #3	198	222	40 kV	30 µA	200	3	
Filter #4	223	228	40 kV	43 µA	200	4	
Filter #5	103	222	15 kV	25 µA	200	2	

Pulse Length 200 Auto Mode Re-Read Settings Update Settings Start Update Actuals Monitor Actuals

Pulse Period 254 Tube Enabled

Log Data to File: Start Logging

Script File: Start Script

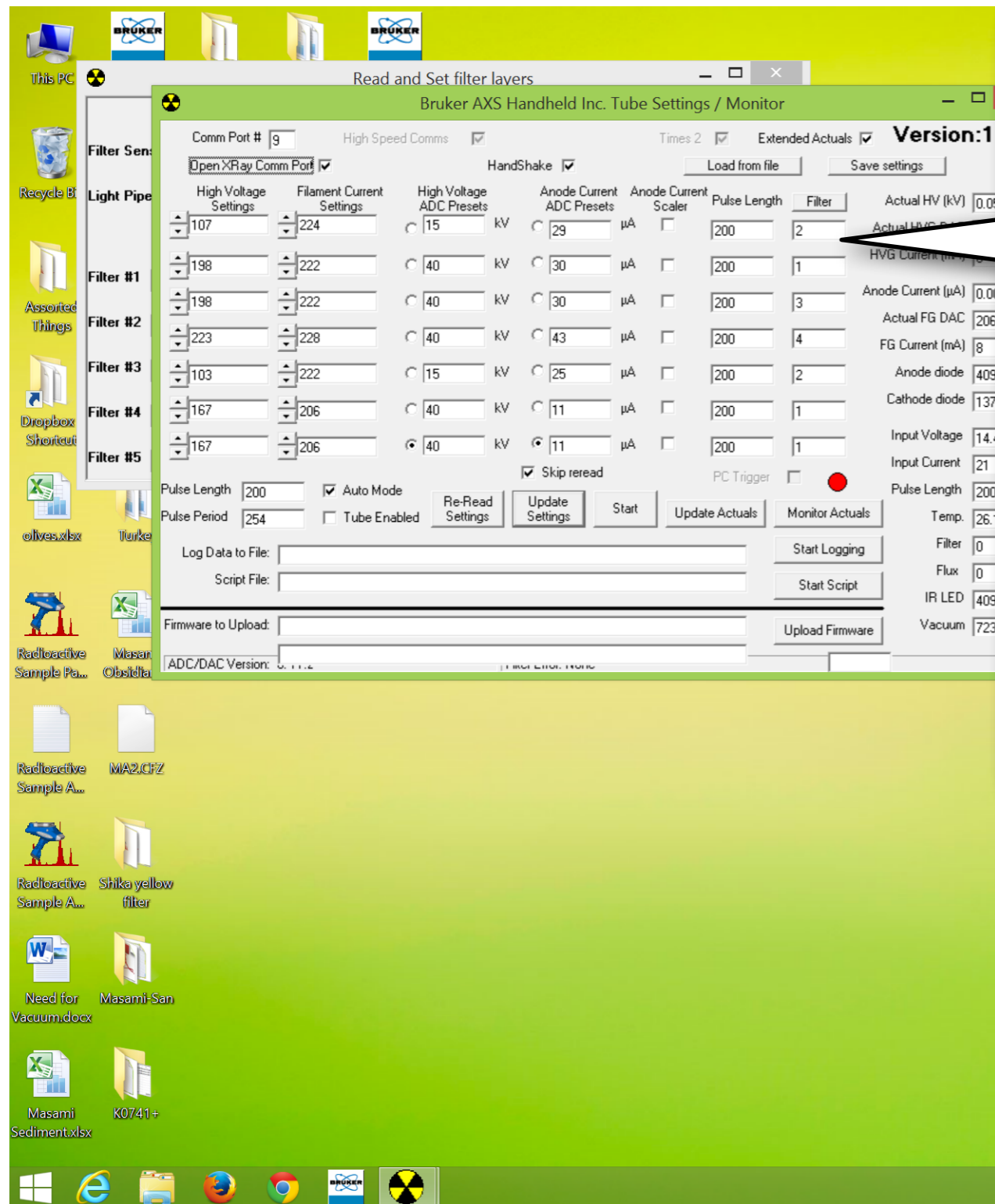
Firmware to Upload: Upload Firmware

ADC/DAC Version: 0.1.1.2

Actual HVG 206
Actual FG DAC 206
FG Current (mA) 8
Anode diode 4095
Cathode diode 137
Input Voltage 14.4
Input Current 21
Pulse Length 200
Temp. 26.1
Filter 0
Flux 0
IR LED 4095
Vacuum 723

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Changing X-Box Settings



The final column includes your filters. If you manually use filters, you may not want to change these. If, however, you have a Tracer IV or a model which has a filter wheel, these will be important to specify

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.2

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Filter #1	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	
Filter #3	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	
Filter #4	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	
Filter #5	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	
Filter #6	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	
Filter #7	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled

Log Data to File: Start Logging

Script File: Start Script

Firmware to Upload: Upload Firmware

ADC/DAC Version:

Actual HV (kV) 0.05

HVG Current (mA) 0

Anode Current (μ A) 0.00

Actual FG DAC 206

FG Current (mA) 8

Anode diode 4095

Cathode diode 137

Input Voltage 14.4

Input Current 21

Pulse Length 200

Temp. 26.1

Filter 0

Flux 0

IR LED 4095

Vacuum 723

1. 1 mil Ti/12 mil Al (Yellow)

2. No Filter

3. 1 mil Cu/1 mil Ti/12 mil Al (Red)

4. 6 mil Cu/1 mil Ti/12 mil Al (Green)

5. 1 mil Ti (Blue)

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Changing X-Box Settings

Read and Set filter layers

High Speed Comms Times 2 Extended Actuals Version: 1.2.21

Comm Port # 9 Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	167
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	0
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	0.00
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	206
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	8
	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	4095

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled Re-Read Settings Update Settings Start Update Actuals Monitor Actuals

Log Data to File: Start Logging

Script File: Start Script

Firmware to Upload: Upload Firmware

ADC/DAC Version: 0.1.1.2

Actual HV (kV) 0.05
Actual HVG DAC 167
HVG Current (mA) 0
Anode Current (μ A) 0.00
Actual FG DAC 206
FG Current (mA) 8
Anode diode 4095
Cathode diode 137
Input Voltage 14.4
Input Current 21
Pulse Length 200
Temp. 26.1
Filter 0
Flux 0
IR LED 4095
Vacuum 723

The last column features the actual settings when you test your parameters

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings

Comm Port # 9 High Speed Comms Times

Open XRay Comm Port HandShake

	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>
Filter #2	198	222	40 kV	30 μ A	<input type="checkbox"/>
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>
Filter #6	167	206	40 kV	11 μ A	<input type="checkbox"/>

Pulse Length 200 Auto Mode Skip reread

Pulse Period 254 Tube Enabled

Re-Read Settings Update Settings Start Upd

Log Data to File: _____

Script File: _____

Firmware to Upload: _____ Upload Firmware

IR LED 4095

Vacuum 723

ADC/DAC Version: _____

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Comm Port # 9 High Speed Comms Times 2 Extended Actuals Version: 1.2.21

Open XRay Comm Port HandShake Load from file Save settings

High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	0.05
198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 167
198	222	40 kV	30 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 0
223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 0.00
103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 206
167	206	40 kV					FG Current (mA) 8
167	206	40 kV					Anode diode 4095

Pulse Length 200 Auto Mode Re-Read Settings
Pulse Period 254 Tube Enabled

Log Data to File: _____
Script File: _____

Firmware to Upload: _____
ADC/DAC Version: _____

Here, I am selecting parameters not used in any calibration, check with Bruker Elemental to find out what parameters your calibrations are based on

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Comm Port # 9 High Speed Comms Times 2 Extended Actuals Version: 1.2.21

Open XRay Comm Port HandShake Load from file Save settings

High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
107	224	<input type="radio"/> 15 kV	<input type="radio"/> 29 μ A	<input type="checkbox"/>	200	2	0.05
198	222	<input type="radio"/> 40 kV	<input type="radio"/> 30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 167
198	222	<input type="radio"/> 40 kV	<input type="radio"/> 30 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 0
223	228	<input type="radio"/> 40 kV	<input type="radio"/> 43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 0.00
103	222	<input type="radio"/> 15 kV	<input type="radio"/> 25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 206
167	206	<input type="radio"/> 40 kV					FG Current (mA) 8
167	206	<input checked="" type="radio"/> 40 kV					Anode diode 4095

Pulse Length 200 Auto Mode Re-Read Settings
Pulse Period 254 Tube Enabled

Log Data to File: _____
Script File: _____

Firmware to Upload: _____ Upload Firmware

ADC/DAC Version: _____

Right now, this calibration is using 40 keV as a target energy

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
107	224	15	29		200	2	0.05
198	222	40	30		200	1	167
198	222	45	30		200	3	0
223	228	40	43		200	4	0.00
103	222	15	25		200	2	206
167	206	40					8
167	206	40					4095

Pulse Length: 200, Pulse Period: 254, Auto Mode: Tube Enabled:

Log Data to File: _____
Script File: _____

Firmware to Upload: _____

ADC/DAC Version: _____

Actual HV (kV): 0.05
Actual HVG DAC: 167
HVG Current (mA): 0
Anode Current (μA): 0.00
Actual FG DAC: 206
FG Current (mA): 8
Anode diode: 4095

If I want to change the target energy to 45, I replace 40 with 45.

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Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
107	224	15 kV	29 µA		200	2	0.05
198	222	40 kV	30 µA		200	1	Actual HVG DAC 167
198	222	45 kV	31 µA		200	3	HVG Current (mA) 0
223	228	40 kV	43 µA		200	4	Anode Current (µA) 0.00
103	222	15 kV	25 µA		200	2	Actual FG DAC 206
167	206	40 kV	11 µA				FG Current (mA) 8
167	206	40 kV	11 µA				Anode diode 4095

Pulse Length 200 Auto Mode
Pulse Period 254 Tube Enabled

Log Data to File: _____
Script File: _____

Firmware to Upload: _____

ADC/DAC Version: _____

Re-Read Settings Update Settings

Skip reread

Load from file Save settings

I can do the same to the target current, I change 30 µA to 31 µA

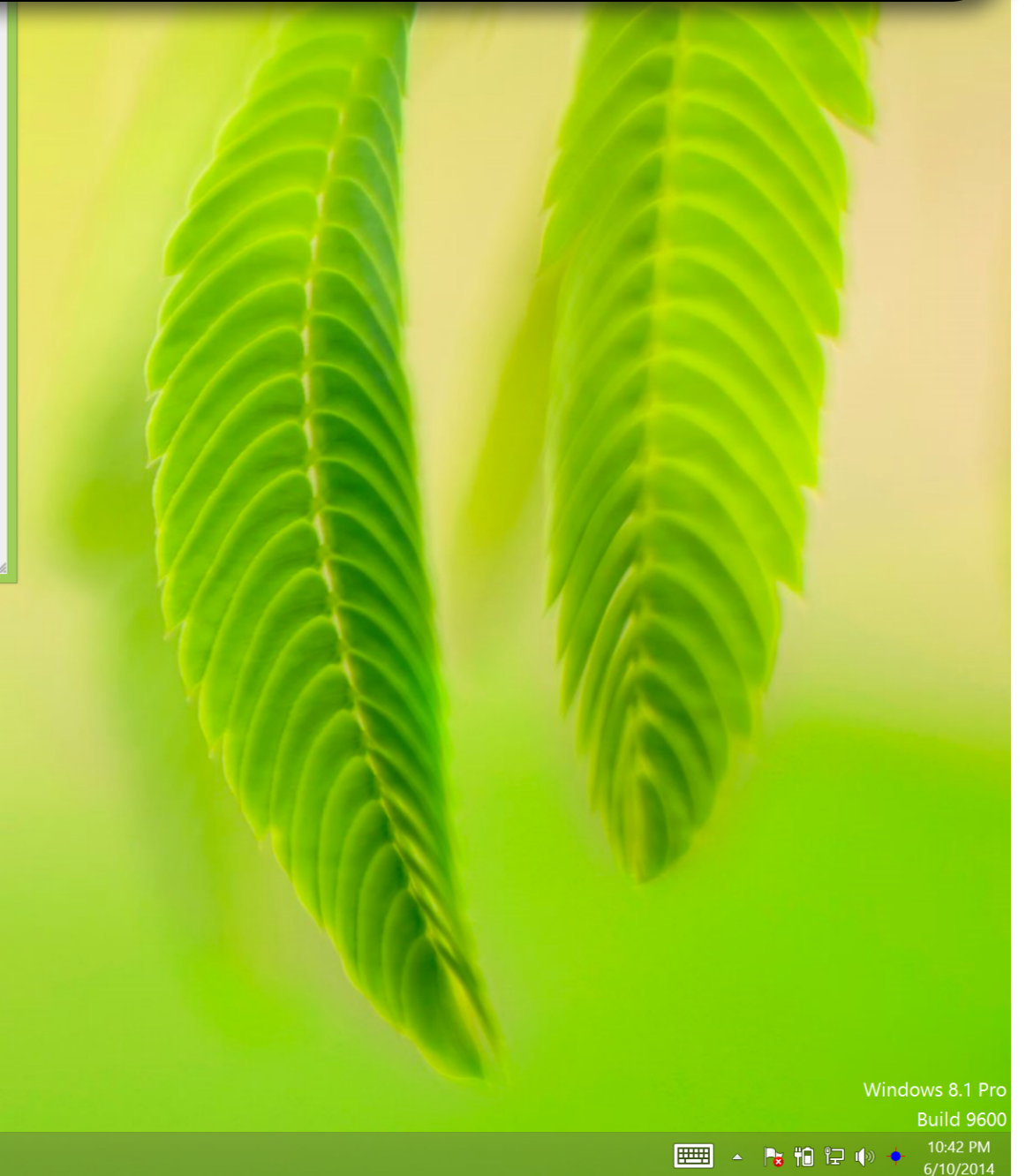
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Build 9600
10:42 PM
6/10/2014

Changing X-Box Settings

Here, we have the input voltage and current. These must be changed as well

The screenshot displays the Bruker software interface for configuring X-ray parameters. The window title is "Bruker". The interface is divided into several sections:

- High Voltage Settings:** Includes dropdown menus for High Voltage (107, 198, 198, 223, 103, 167, 167 kV) and Filament Current (224, 222, 222, 228, 222, 206, 206 μ A).
- High Voltage ADC Presets:** Radio buttons for 15, 40, 45, 40, 15, 40, 40 kV.
- Anode Current ADC Presets:** Radio buttons for 29, 30, 31, 43, 25, 11, 11 μ A.
- Anode Current Scaler:** Checkboxes for scaling.
- Pulse Length:** Input field set to 200.
- Filter:** Input field set to 2.
- Actuals:** A list of real-time values including Actual HV (0.05 kV), Actual HVG DAC (167), HVG Current (0 mA), Anode Current (0.00 μ A), Actual FG DAC (206), FG Current (8 mA), Anode diode (4095), Cathode diode (137), Input Voltage (14.4), Input Current (21), Pulse Length (200), Temp. (26.1), Filter (0), Flux (0), IR LED (4095), and Vacuum (723).
- Control Buttons:** Includes "Re-Read Settings", "Update Settings", "Start", "Update Actuals", "Monitor Actuals", "Start Logging", "Start Script", and "Upload Firmware".
- Other Settings:** Includes "Comm Port # 9", "Open XRay Comm Port", "Auto Mode", "Skip reread", "PC Trigger", "Log Data to File", "Script File", and "Firmware to Upload".



The desktop environment shows a Windows 8.1 Pro interface with a taskbar at the bottom. The taskbar includes icons for Internet Explorer, File Explorer, Firefox, Chrome, and the Bruker application. The desktop background is a green fern leaf image. The system tray in the bottom right corner displays the time as 10:42 PM on 6/10/2014 and the system status.

Changing X-Box Settings

The current high voltage setting for 40 keV is 198 - it will likely have to be higher to maintain 45 keV

The screenshot displays the Bruker X-ray software interface on a Windows 8.1 desktop. The software window is titled 'Read and...' and contains several sections for configuring X-ray parameters. A callout box highlights the 'High Voltage Settings' section, where the current setting for 40 keV is 198. The software also shows 'Filament Current Settings' and 'Filter Settings' for five different filters. The desktop background is a green leaf image. The taskbar at the bottom shows the Windows logo, Internet Explorer, and other applications. The system tray in the bottom right corner displays 'Windows 8.1 Pro Build 9600', the time '10:42 PM', and the date '6/10/2014'.

Filter	High Voltage (kV)	Filament Current (µA)
Filter #1	198	30
Filter #2	198	31
Filter #3	223	43
Filter #4	103	25
Filter #5	167	11

Changing X-Box Settings

Here, a slightly higher voltage setting of 201 will be tested.

The screenshot displays a software interface for configuring X-ray settings. A callout box highlights the 'Filter #1' voltage setting, which is set to 201. The interface includes various input fields for voltage, current, and pulse length, along with buttons for 'Start', 'Update Settings', and 'Monitor Actuals'. The desktop background is a green leaf pattern.

Filter	High Voltage Settings	Filament Current Settings
Filter #1	201	222
Filter #2	223	228
Filter #3	103	222
Filter #4	167	206
Filter #5	167	206

Other settings visible in the interface include:

- Comm Port #: 9
- High Voltage Settings: 107
- Filament Current Settings: 224
- Pulse Length: 200
- Pulse Period: 254
- Input Voltage: 14.4
- Input Current: 21
- Temp: 26.1
- Filter: 0
- Flux: 0
- IR LED: 4095
- Vacuum: 723

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	<input type="radio"/> 15 kV	<input type="radio"/> 29 μ A	<input type="checkbox"/>	200	2	2.10
Filter #1	198	222	<input type="radio"/> 40 kV	<input type="radio"/> 30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 169
Filter #2	201	222	<input checked="" type="radio"/> 45 kV	<input checked="" type="radio"/> 31 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 2
Filter #3	223	228	<input type="radio"/> 40 kV	<input type="radio"/> 43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 0.00
Filter #4	103	222	<input type="radio"/> 15 kV	<input type="radio"/> 25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 206
Filter #5	167	206	<input type="radio"/> 40 kV	<input type="radio"/> 40 μ A	<input type="checkbox"/>	200	1	FG Current (mA) 9
	167	206	<input type="radio"/> 40 kV	<input type="radio"/> 11 μ A	<input type="checkbox"/>	200	1	Anode diode 4095

Pulse Length 200 Auto Mode Re-Read Settings Update Settings Start

Pulse Period 254 Tube Enabled

Log Data to File: Script File: Firmware to Upload: ADC/DAC Version: 0.1.1.2

Windows 8.1 Pro Build 9600 10:44 PM 6/10/2014

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	2.10
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 169
Filter #2	201	222	45 kV	31 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 2
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 0.00
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 206
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	FG Current (mA) 9
	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	Anode diode 4095

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled Re-Read Settings Update Settings Start Update Actuals Monitoring Actuals

Log Data to File: Start Logging

Script File: Start Script

Firmware to Upload: Upload Firmware

ADC/DAC Version: 0.1.1.2

Input Voltage	14.4
Input Current	23
Pulse Length	201
Temp.	27.0
Filter	0
Flux	0
IR LED	4095
Vacuum	723

Then click 'Monitor Actuals'

Windows 8.1 Pro
Build 9600
10:44 PM
6/10/2014

Changing X-Box Settings

The screenshot shows the Bruker AXS Handheld Inc. Tube Settings / Monitor software interface. The window title is "Bruker AXS Handheld Inc. Tube Settings / Monitor" and the version is "Version: 1.2.21". The interface includes various settings for High Voltage, Filament Current, High Voltage ADC Presets, Anode Current, Anode Current ADC Presets, Anode Current Scaler, Pulse Length, and Filter. A callout box points to the "Actuals" section, which displays the following values:

Parameter	Value
Actual HV (kV)	45.15
Actual HVG DAC	225
Anode Current (mA)	405
Anode Current (µA)	31.05
Actual FG DAC	222
FG Current (mA)	146
Anode diode	8
Cathode diode	4095
Input Voltage	13.8
Input Current	276
Pulse Length	201
Temp.	28.2
Filter	0
Flux	0
IR LED	4095
Vacuum	722

The callout box contains the text: "If your Actuals match your target energy and current, you are good to go".

Windows 8.1 Pro
Build 9600
10:47 PM
6/10/2014

Changing X-Box Settings

If not, you can unselect 'PC Trigger' then turn off 'Monitor Actuals'

The screenshot shows the Bruker AXS Tube Settings / Monitor software interface. The window title is "Bruker AXS Handheld Inc. Tube Settings / Monitor" and the version is "Version: 1.2.21". The interface includes a table of settings for multiple channels, a "PC Trigger" checkbox, and a "Monitor Actuals" button. A callout box points to the "Monitor Actuals" button.

Channel	Pulse Length	Filter	Actual HV (kV)	Actual HVG DAC	HVG Current (mA)	Anode Current (µA)	Actual FG DAC	FG Current (mA)	Anode diode	Cathode diode	Input Voltage	Input Current	Pulse Length	Temp.	Filter	Flux	IR LED	Vacuum	
1	200	2	2.95	225	3	0.00	222	9	4095	139	14.3	23	200	28.2	0	0	4095	723	
2	200	1																	
3	200	3																	
4	200	4																	
5	200	2																	
6	200	1																	
7	200	1																	

Buttons: Load from file, Save settings, Monitor Actuals, Start Logging, Start Script, Upload Firmware.

System tray: Windows 8.1 Pro, Build 9600, 10:46 PM, 6/10/2014.

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Comm Port # 9 High Speed Comms Times 2

Open XRay Comm Port HandShake Load from

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200
Filter #2	230	228	40 kV	43 μ A	<input type="checkbox"/>	200
Filter #3	103	222	15 kV	25 μ A	<input type="checkbox"/>	200
Filter #4	167	206	40 kV	11 μ A	<input type="checkbox"/>	200
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200

Pulse Length 200 Auto Mode Skip reread

Pulse Period 254 Tube Enabled

Log Data to File:

Script File:

Firmware to Upload:

ADC/DAC Version: 0.1.1.2

Start Script

Upload Firmware

Flux 0

IR LED 4095

Vacuum 723

Start

Update Actuals

Windows 8.1 Pro
Build 9600
10:46 PM
6/10/2014

I can then select a new high voltage setting, in this case 230

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

Filter	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
Light Pipe	107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	45.15
Filter #1	198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 225
Filter #2	230	222	45 kV	31 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 405
Filter #3	223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 31.05
Filter #4	103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 222
Filter #5	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	FG Current (mA) 146
	167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	Anode diode 8

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled

Re-Read Settings Update Settings Start Update Actuals Monitoring Actuals

Log Data to File: Start Logging

Script File: Start Script

Firmware to Upload: Load Firmware

ADC/DAC Version: 0.1.1.2

Actual HV (kV) 45.15
Actual HVG DAC 225
HVG Current (mA) 405
Anode Current (μ A) 31.05
Actual FG DAC 222
FG Current (mA) 146
Anode diode 8
Cathode diode 4095
Input Voltage 13.8
Input Current 276
Pulse Length 201
Temp. 28.2
Filter 0
Flux 0
IR LED 4095
Vacuum 722

Windows 8.1 Pro
Build 9600
10:47 PM
6/10/2014

To test this, I can click 'Monitor Actuals' then 'PC Trigger'

Changing X-Box Settings

Read and Set filter layers

Bruker AXS Handheld Inc. Tube Settings / Monitor

Version: 1.2.21

Comm Port # 9 High Speed Comms Times 2 Extended Actuals

Open XRay Comm Port HandShake Load from file Save settings

High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	Anode Current ADC Presets	Anode Current Scaler	Pulse Length	Filter	Actual HV (kV)
107	224	15 kV	29 μ A	<input type="checkbox"/>	200	2	45.15
198	222	40 kV	30 μ A	<input type="checkbox"/>	200	1	Actual HVG DAC 225
230	222	45 kV	31 μ A	<input type="checkbox"/>	200	3	HVG Current (mA) 405
223	228	40 kV	43 μ A	<input type="checkbox"/>	200	4	Anode Current (μ A) 31.05
103	222	15 kV	25 μ A	<input type="checkbox"/>	200	2	Actual FG DAC 222
167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	FG Current (mA) 146
167	206	40 kV	11 μ A	<input type="checkbox"/>	200	1	Anode diode 8

Pulse Length 200 Auto Mode Skip reread PC Trigger

Pulse Period 254 Tube Enabled Re-Read Settings Update Settings Start Update Actuals Monitoring Actuals

Log Data to File: Start Logging

Script File: Start Script

Firmware to Upload: Upload Firmware

ADC/DAC Version: 0.1.1.2

Actuals
Input Voltage 13.8
Input Current 276
Pulse Length 201
Temp. 28.2
Filter 0
Flux 0
IR LED 4095
Vacuum 722

Windows 8.1 Pro
Build 9600
10:47 PM
6/10/2014

When the Actual energy and current match my target energy and current presents, then you have successfully reprogrammed the X-box