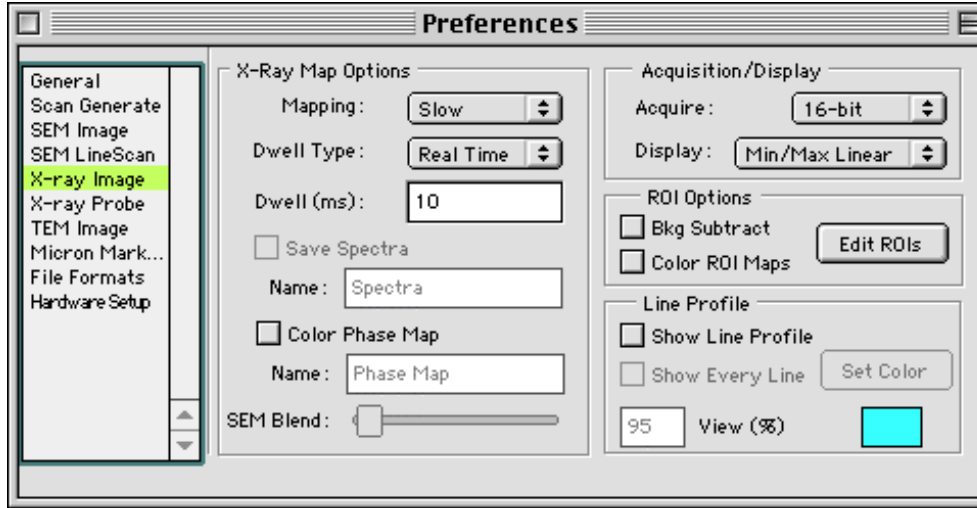


X-ray Imaging Preferences

[\[download as pdf\]](#)

current for: v1.5.6

The X-ray Imaging Preferences panel is shown below:



Other Preferences

[General](#)
[Scan Generate](#)
[SEM Image](#)
[SEM Linescan](#)
• [X-ray Image](#) •
[X-ray Probe](#)
[TEM Image](#)
[Micron Marker](#)
[File Formats](#)
[Hardware Setup](#)

• X-ray Map Options

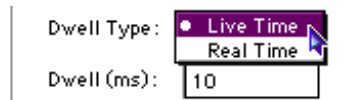
◦ Mapping

- **Fast Mapping.** This feature is unimplemented at this time. However, pseudo Fast Maps can be acquired by setting an image channel to one of the SCAs rather than an ADC input. Any ROIs assigned to that SCA will be mapped in that image. [\[more info\]](#)



- **Slow Mapping.** Slow mapping positions the electron beam on a pixel-by-pixel basis, where it dwells and acquires a spectrum for either the live-time or the real-time interval (set below) before moving to the next pixel.

◦ Dwell Type



- **Live Time.** Defines the dwell as **live**time milliseconds; data will be recorded at each pixel location for [in this example] 10 ms of **live** time. The actual acquire time will be longer than [in this example] 10 ms per pixel (perhaps greatly so), depending on the deadtime accrued.
- **Real Time.** Defines the dwell as **real**time milliseconds; data will be recorded at each pixel location for [in this example] 10 ms, regardless of accrued deadtime.

- **Dwell.** Dwell time in **milliseconds**. The default value is 10 ms; the minimum value is 1 ms. *The user should perform a back-of-the-envelope calculation to determine whether the dwell time, for a given count rate, is enough to see any data!*

- **Save Spectra.** When turned on, a spectrum at each pixel is saved in Xraytor multiple-spectrum format. This checkbox is available only if [Auto Save](#) in General Preferences is turned on. No further documentation is available at this time; contact [4pi support](#) for more information.
- **Color Phase Map.** When turned on, the colors assigned to each active ROI are used to create a composite map including all the active ROIs. Colors for each ROI are selected in the [ROI Options](#).
- **Name(s).** Name assigned to the color phase image or the spectrum files.
- **SEM Blend.** Selects how much of a grey-scale SEM image is included (blended) into a color phase map. This adjustment has an immediate effect on the phase map during active preview and acquisition, but is disabled after acquisition is complete (it cannot be reset after the fact).

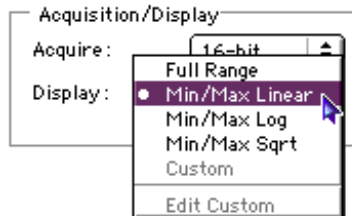
• Acquisition/Display

- **8/16 bit**



Specifies whether the maps will be saved to disk or displayed with 8-bit or 16-bits at each pixel. For x-ray maps, data are always acquired with a resolution of **32 bits**. When **8-bit (16-bit)** is selected, the lower **8 (16)** bits of the 32-bit word is retained.

- **Display Mode**

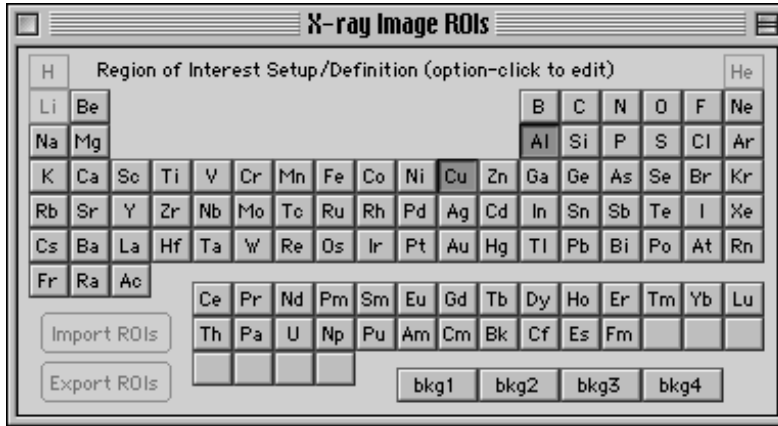


Operates the same as the [Display](#) menu in the SEM Image Preferences.

• ROI Options

- **Color ROI Maps.** When turned on, the color assigned to a particular ROI is used when it appears in a map. Colors are selected in the Edit ROIs dialog window (below). The color created in the map is "shaded" by the actual grayscale data. For example, an 8-bit grayscale pixel of value x , when colored **magenta**, will be displayed as the color $(x, 0, x)$, and when colored **blue**, will be displayed as the color $(0, 0, x)$. See important discussion regarding color ROI maps in the [File Formats Prefs](#).
- **Bkg Subtract.** Performs elementary background subtraction on the spectrum before evaluating counts within the ROIs.
- **Edit ROIs.** The **Edit ROI** button presents a window (below) showing each element for which a mapping ROI can be defined. Elements that are generally inaccessible by EDX methods are not available (H, He, Li). Copper (Cu) and Aluminum (Al) are turned on by default, since they are

commonly used for initial calibration.



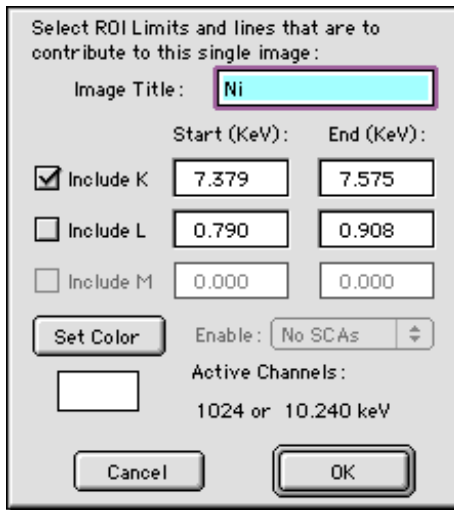
To turn on a ROI, single click its button (the button will highlight).

To turn off a ROI, single click again (the highlight will disappear).

If X-ray Imaging is running, the map for that ROI will be added to the list of images to be acquired.

If an active preview is in progress, the map for that ROI will immediately appear on screen.

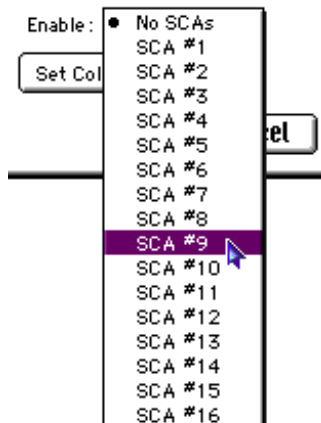
To see or change individual ROI settings, option-click (Mac) or alt-click (PC) on the element of choice. The following window will appear (Nickel shown here):



The **Image Title** is the name that will appear in the titlebar of the window that contains the data for this element. It is also the name of the file that will be saved to disk for that image.

The **Include** checkboxes determine whether the ROI consists of K, L, or M lines (if applicable). The energy limits of each ROI (min/max) can be edited to suit the user. Default values are supplied for most elements.

The **Set Color** button accesses the operating system's color-picking services, and allows you to select the ROI color used to create individual x-ray maps or color phase maps.



The **Enable SCA** menu allow a user to select a Single Channel Analyzer output. This feature is an option on certain 4pi hardware and provides up to **16 (4)** such outputs on version 2.2 (2.3) SEII cards. While in a ROI dialog, choose the ROI information to be echoed on any one of the SCA outputs simply by selecting a menu item (left).

For example, if SCA #9 is selected (above), whenever an x-ray pulse is deemed to fall within the selected ROI, a single TTL pulse will be sent through SCA port #9. The SCAs are OR-ed together, so multiple ROIs can be assigned to the same SCA. Up to 48 different ROIs can be mapped to the SCAs (in other words, overlap is allowed). The actual connection method varies. The SEII 2.3 card has 4 SMB (mini-BNC) connectors on board, one for each SCA; the cable may be a set of coax lines which connect to a special computer rear-panel connector not unlike the standard SEII 37-pin rear-panel D-connector.

signal pins	ground pins
SCA1 = pin 1	2
SCA2 = pin 3	4
.	.
[odd pins]	[even pins]
.	.
SCA16 = pin 31	32
pin 33 = unused	34

The SEII 2.2 card has an on-board 34-pin header with the pinout shown to the left (SCA outputs are the odd pins); the cable may be a ribbon cable which connects the header to a special computer rear-panel connector not unlike the standard SEII 37-pin rear-panel D-connector.

The polarity of the TTL SCA signal is set via a jumper (JMP1) on the SEII board. When the jumper is present, the TTL pulses are positive-going. The polarity of all the SCA outputs is set collectively by the jumper. The SCA pulse is currently fixed at 10 microseconds.

• *Line Profile Options*

- **Show Line Profile.** Checking this box overlays a real-time graph of sequential line profiles on the map, useful for feedback on the scan and mapping operation. Since this graph is updated in real-time, it may jump around quite a bit because of the sample morphology or x-ray activity.

Coincident with the centerline zero level is a draggable reference line. Click your mouse within the vicinity of this line and drag. A new line will appear that can be positioned anywhere within the map. This marks the line in the map which is used for the real-time line profile overlay.

In acquired maps, the line profile can be displayed or hidden, regardless of the setting of the checkbox before acquisition, using the menu item **Options > Show Line Plot** or **Options > Hide Line Plot**.

- **Show Every Line.** Checking this causes a tick mark indicating the current scan-line to run on the left side of the map, giving real-time feedback on the scan position.
- **Set Color.** This button accesses the operating system's color-picking services, and allows the line-profile color to be set.
- **View %.** Enter a number between 0 and 100 to set the physical size of the line profile within the image window as a percentage of the half-height image window size. The default is 95%.