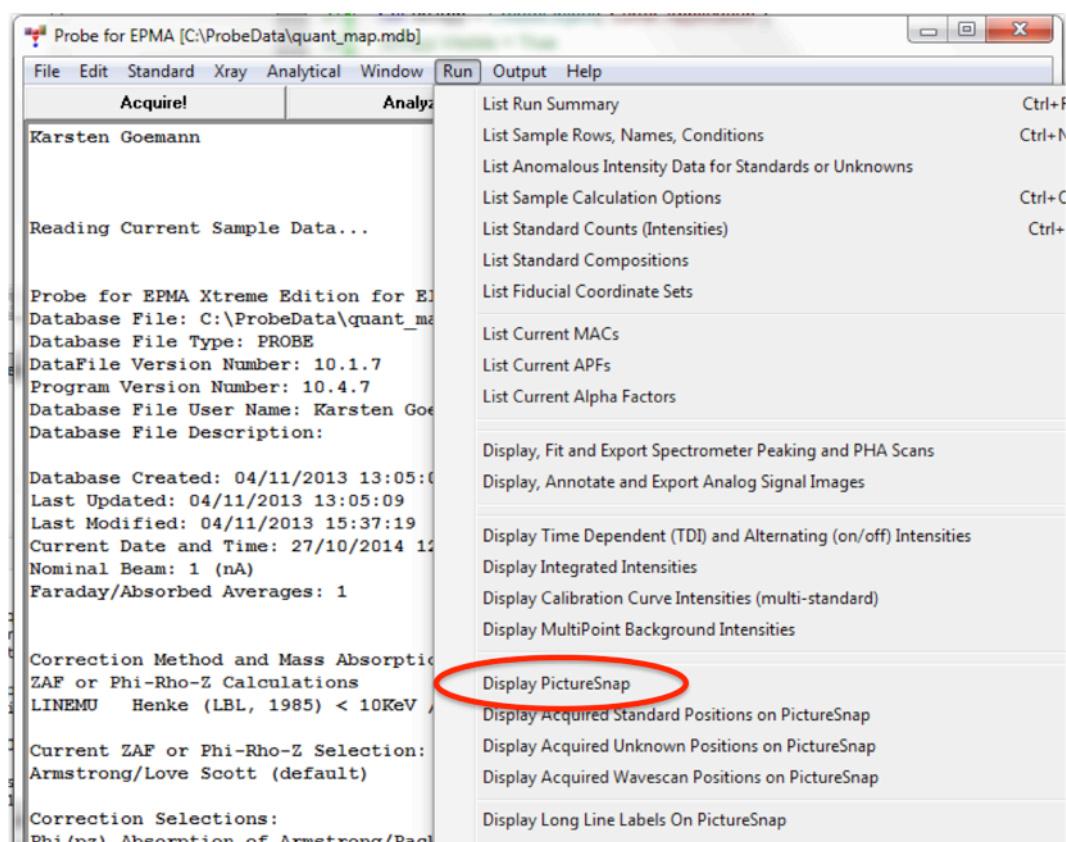


How to register images in PictureSnap for navigation

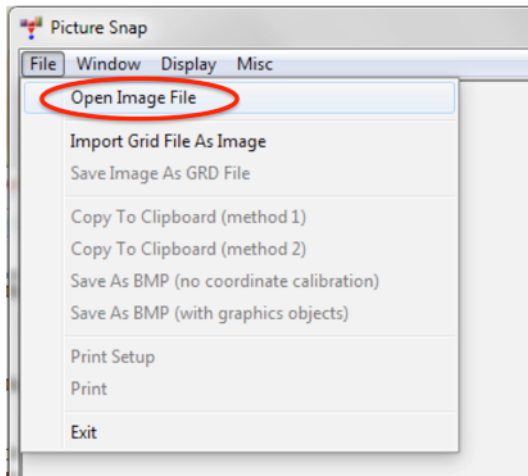
This How-to was put together using Probe For EPMA in demo mode with a Cameca SX100 configuration. Depending on your instrument and configuration some details (e.g. stage positions) might be different.

Karsten Goemann, 30 December 2014

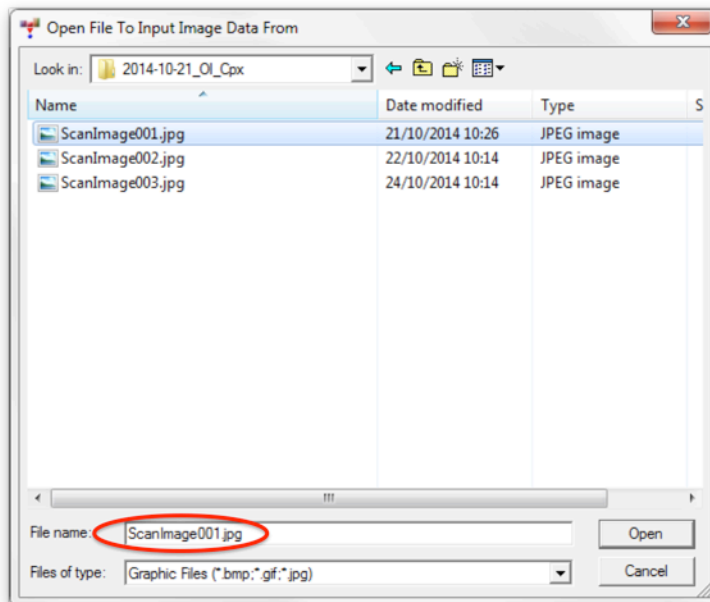
1. Select **Display PictureSnap** from **Run** menu in main **Probe For EPMA** window:



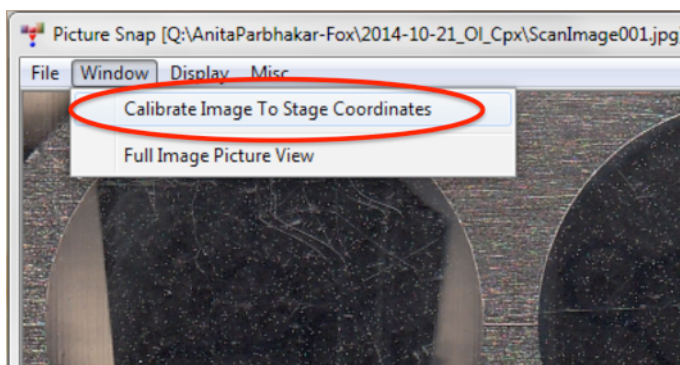
2. In **PictureSnap** window, select **Open Image File** from **File** menu:



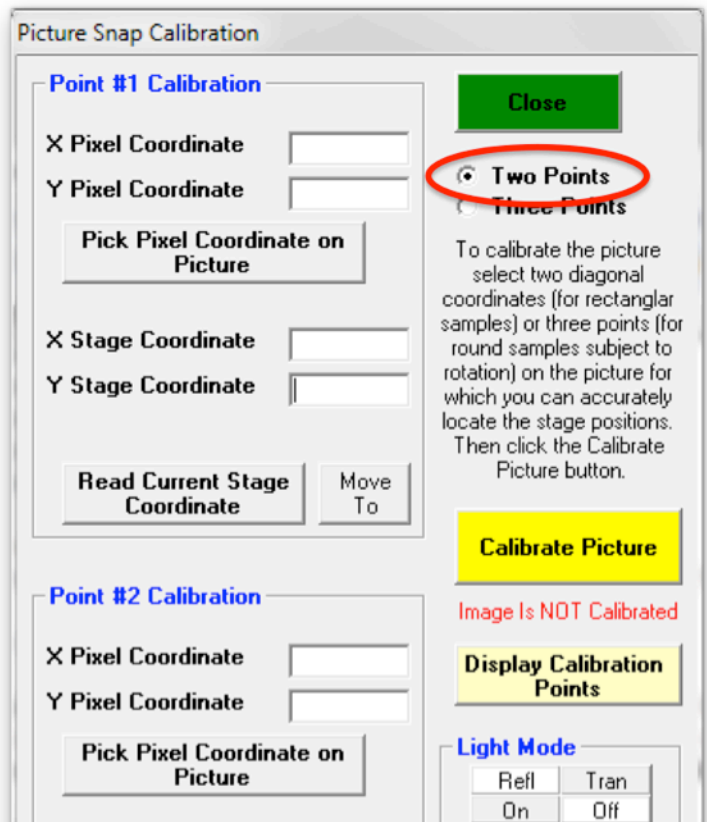
3. **Open File** dialog opens. Choose image file to load. It has to be in .BMP, .JPG, or .GIF format. Click **Open**:



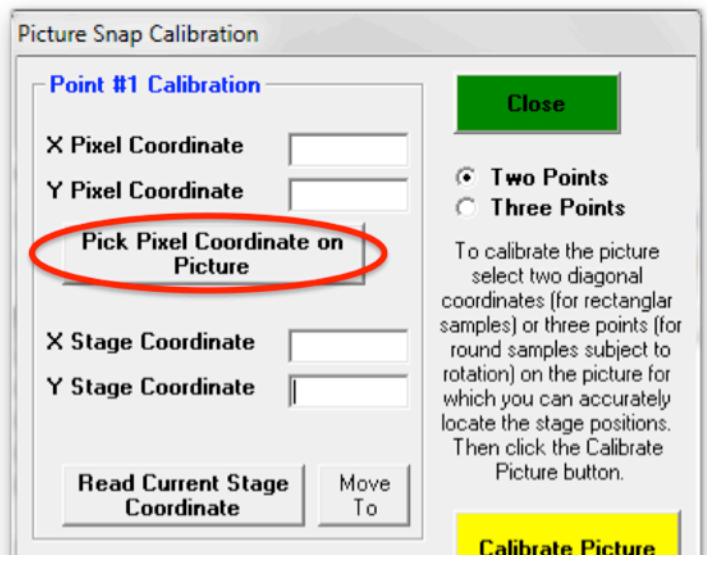
4. Image file is opened in PictureSnap. Select **Calibrate Image to Stage Coordinates** from **Window** menu:



5. The **Picture Snap Calibration** Window opens. All pixel and stage coordinate fields should be empty. To use 2 reference points for calibration, ensure the radio button for **Two Points** is selected:



6. In **Point #1 Calibration** section, click **Pick Pixel Coordinate on Picture**:

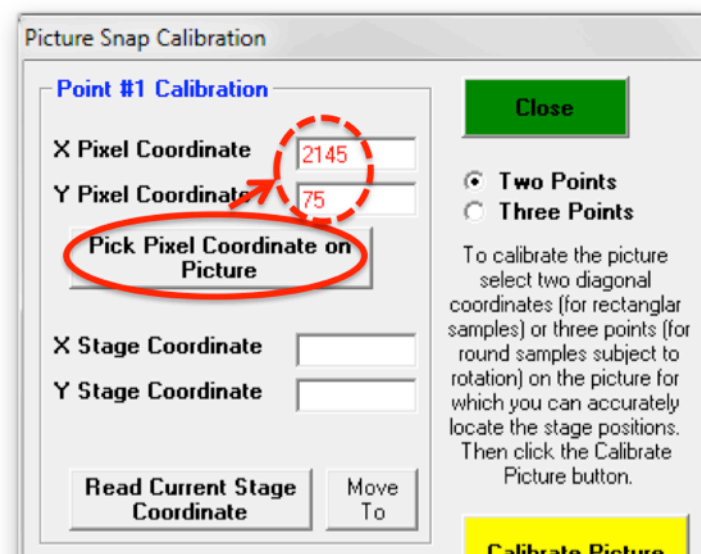


7. Now click onto the feature to be used as first reference point in the picture.
Note: This feature should be close to one corner of the imported image and be easily recognisable in both the imported image as well as the live imaging of the instrument (SE/BSE or built-in light microscope).

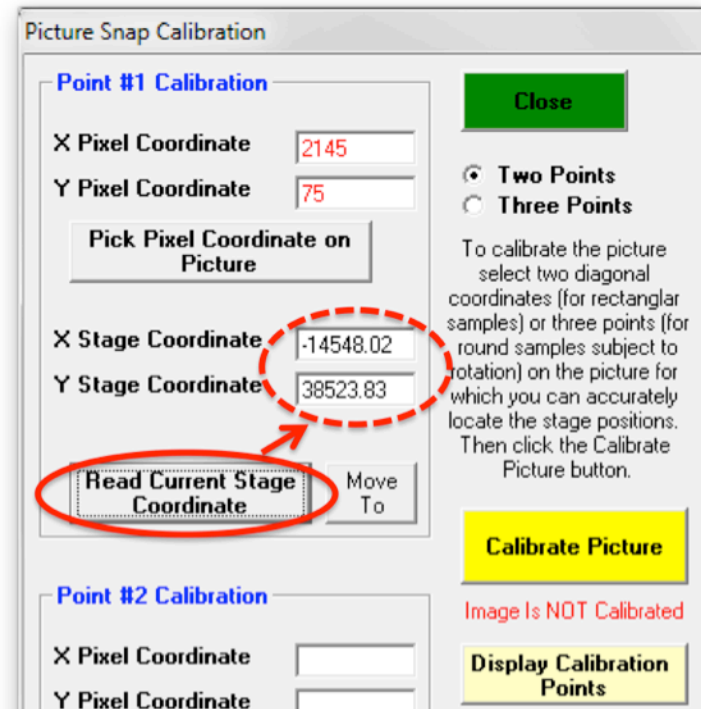
Here we will use the arrow marker of the top left sample:



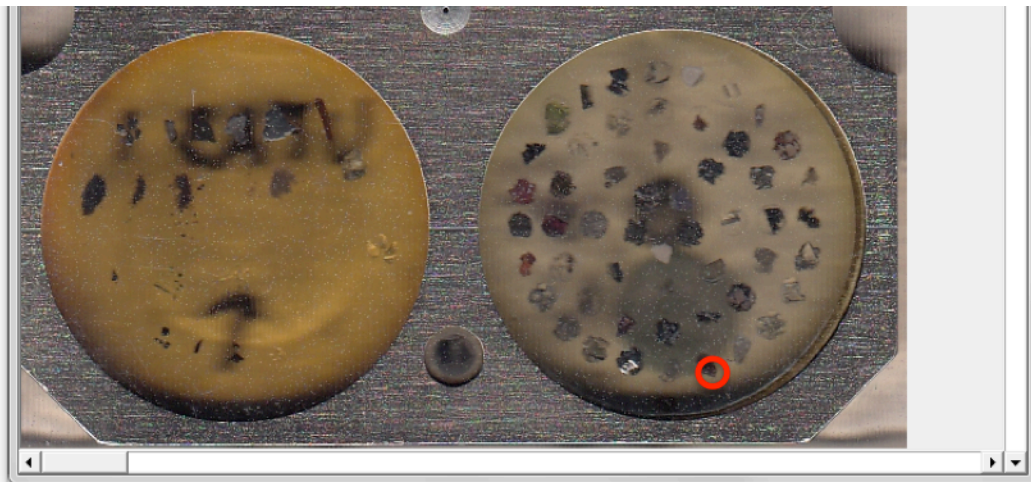
8. The corresponding pixel coordinate is now displayed:



9. Drive stage to the actual position of this feature, for example using joystick, trackball or similar. Click **Read Current Stage Coordinate**:



10. Repeat steps 6 to 9 for **Point #2** in the respective section, using a feature in the bottom right area of the image, for example a sharp corner of a grain:

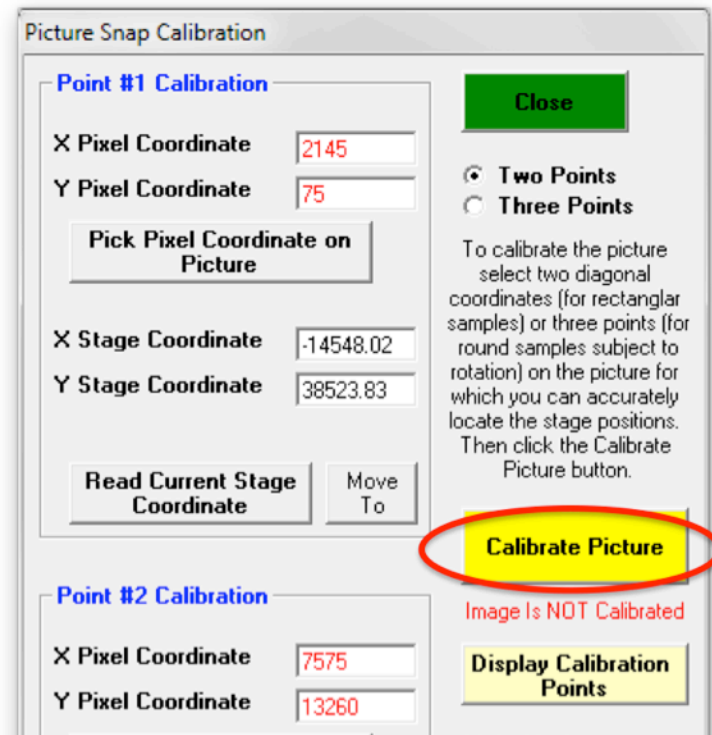


11. The **Picture Snap Calibration** window should now look similar to this, with values in all coordinate fields:

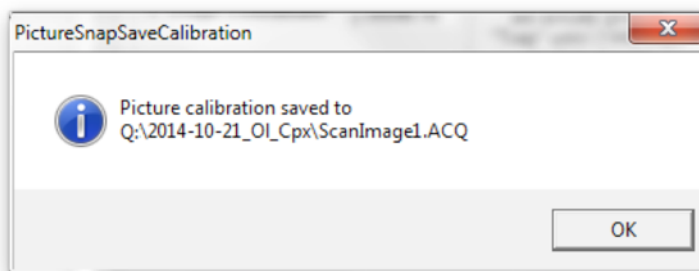
The screenshot shows the 'Picture Snap Calibration' window with two calibration points. Each point has input fields for X and Y Pixel Coordinates and X and Y Stage Coordinates. There are also buttons for 'Pick Pixel Coordinate on Picture', 'Read Current Stage Coordinate', and 'Move To'. The window includes a 'Close' button, radio buttons for 'Two Points' (selected) and 'Three Points', a 'Calibrate Picture' button, a 'Display Calibration Points' button, and a 'Light Mode' section with 'Refl', 'Tran', 'On', and 'Off' buttons. A status message reads 'Image Is NOT Calibrated'. A note at the bottom explains that X and Y Pixel Coordinates are in 'Twip' units (1440 twips per logical inch).

Point	X Pixel Coordinate	Y Pixel Coordinate	X Stage Coordinate	Y Stage Coordinate
Point #1	2145	75	-14548.02	38523.83
Point #2	7575	13260	-16091.24	-35596.16

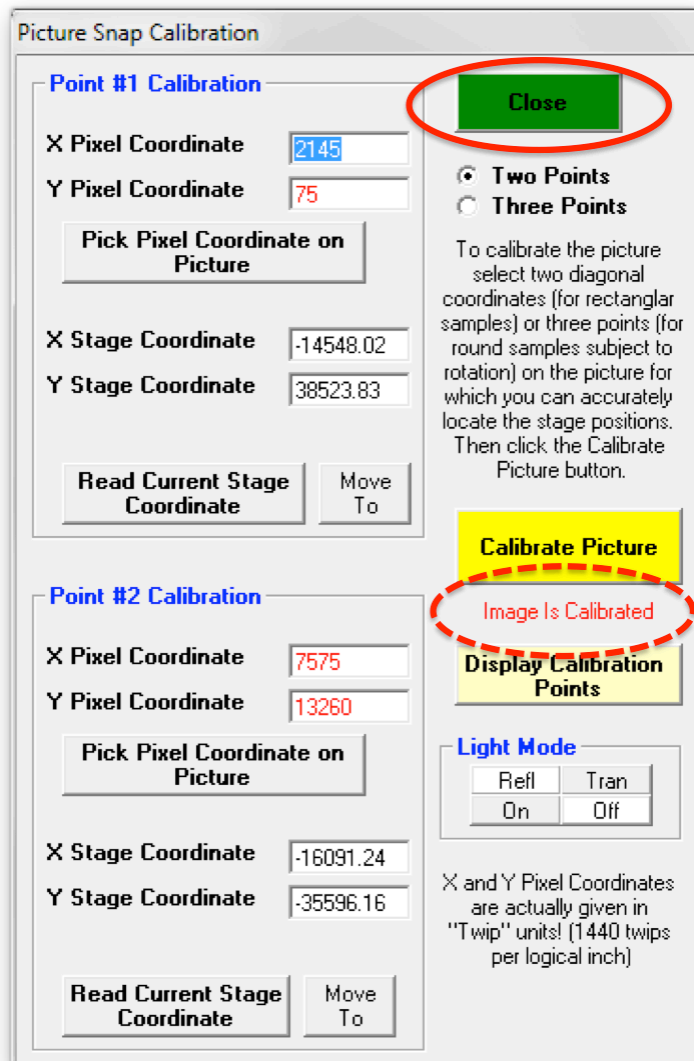
12. Click **Calibrate Picture**:



13. The calibration will be saved into a separate small ASCII text file with .ACQ extension. As long as the .ACQ file is kept together with the image file, PictureSnap will reload the calibration when the image is reopened. Click **OK**:



14. The **Picture Snap Calibration** window now states that the image is calibrated. Click **Close** to close the window:



15. The image window now displays the current stage position (purple crosshairs). Double-click into the image to move to a different position.



The following steps are optional to improve registration of the image in terms of rotation and orthogonality by using a third fiducial point:

16. Drive the stage to a third fiducial marker by clicking into the image. This point should be distant from the first two points and at a high angle to the connecting line of the first two points, for example the engraved line in the top right corner of the holder:



17. In the **Picture Snap Calibration** window, click the **Three Points** radio button, which causes the image to become **Uncalibrated** again and the window to expand with an additional section for **Point #3**:

Picture Snap Calibration

Point #1 Calibration

X Pixel Coordinate

Y Pixel Coordinate

X Stage Coordinate

Y Stage Coordinate

Z Stage Coordinate

Point #2 Calibration

X Pixel Coordinate

Y Pixel Coordinate

X Stage Coordinate

Y Stage Coordinate

Z Stage Coordinate

Point #3 Calibration

X Pixel Coordinate

Y Pixel Coordinate

X Stage Coordinate

Y Stage Coordinate

Z Stage Coordinate

Two Points

Three Points

To calibrate the picture select two diagonal coordinates (for rectangular samples) or three points (for round samples subject to rotation) on the picture for which you can accurately locate the stage positions. Then click the Calibrate Picture button.

Image Is NOT Calibrated

Light Mode

<input type="checkbox"/> Refl	<input type="checkbox"/> Tran
<input type="checkbox"/> On	<input type="checkbox"/> Off

X and Y Pixel Coordinates are actually given in "Twip" units! (1440 twips per logical inch)

When using a three point calibration, the program automatically includes a Z correction for stage sample tilt!

18. Record *Pixel* and *Stage Coordinate* in the same way as for *Points #1* and *#2*:

Picture Snap Calibration

Point #1 Calibration

X Pixel Coordinate: 2130
Y Pixel Coordinate: 90
Pick Pixel Coordinate on Picture
X Stage Coordinate: -14548
Y Stage Coordinate: 38524
Z Stage Coordinate:
Read Current Stage Coordinate Move To

Point #2 Calibration

X Pixel Coordinate: 7575
Y Pixel Coordinate: 13290
Pick Pixel Coordinate on Picture
X Stage Coordinate: 16091
Y Stage Coordinate: -35598
Z Stage Coordinate:
Read Current Stage Coordinate Move To

Point #3 Calibration

X Pixel Coordinate: 9240
Y Pixel Coordinate: 2220
Pick Pixel Coordinate on Picture
X Stage Coordinate: 25375
Y Stage Coordinate: 26479
Z Stage Coordinate: 310
Read Current Stage Coordinate Move To

Close

Two Points
 Three Points

To calibrate the picture select two diagonal coordinates (for rectangular samples) or three points (for round samples subject to rotation) on the picture for which you can accurately locate the stage positions. Then click the Calibrate Picture button.

Calibrate Picture

Image Is NOT Calibrated

Display Calibration Points

Light Mode

Refl	Tran
On	Off

X and Y Pixel Coordinates are actually given in "Twip" units! (1440 twips per logical inch)

When using a three point calibration, the program automatically includes a Z correction for stage sample tilt!

19. Click **Calibrate Picture** again and click **OK** in the message box to save the new 3-point calibration. The "Image Is Calibrated" message in the **Picture Snap Calibration** window indicates that the new calibration can now be used for navigation:

