

## Adjusting the Compact AFM side view camera (09750-00)

### Introduction

Although current production of Compact AFMs should have their focus adjusted for operation with the optional camera, this may not be the case for early Compact AFMs (Serial number below 15) or the adjustment may change during transport. There are two things to adjust:

1. Focus of the lens in the lens cover
2. Focus, rotation and alignment of the camera

To be able to adjust these settings, the tip must be brought close to the sample surface:

- 1> Set up the system as described in the manual (fig 1), and mount the microstructure sample.

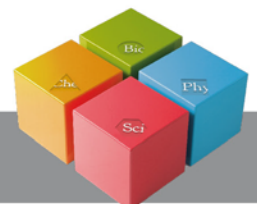


*Fig. 1 Initial AFM setup.*

- 2> Approach the microstructure surface

If it is not possible to get a good side-view with the camera, remove the camera and judge the distance by eye.

- 3> Align the sample stage until top- and side-view images are as in figure 2.



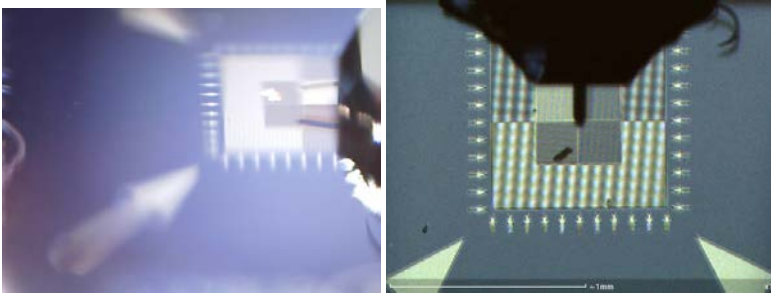


Fig. 2 Left: Side view of cantilever close to surface. Right: Top view of cantilever centered over the sample (the image may differ from the image of the microstructure).

## 1. Focusing the lens in the lens cover

If the focus of the side view is not correct:

- 1> Remove the camera
- 2> Unlock the AFM
- 3> Put back the camera
- 4> Press the AFM down by hand as would be done by the scan head lock

The top and side view images are now the same as they were in the locked position

- 5> Compare the camera image to the pictures in figure 8 to determine if the focus is too high or too low. The arrow markings on the calibration sample help to judge the focus position

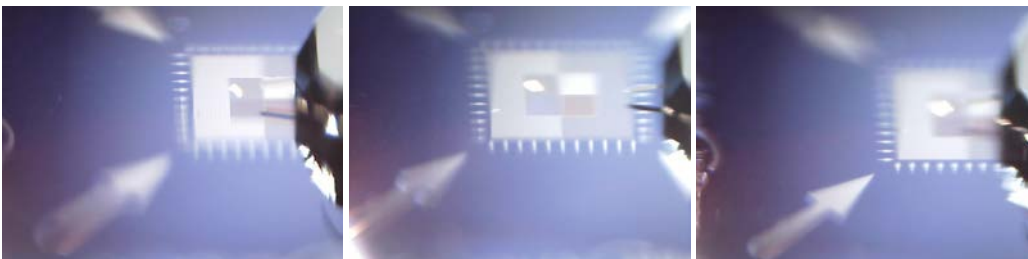


Fig. 8 Side view image of cantilever close to the sample surface. The focus is too far behind (left), good (middle) and too far in front (right).

To see the camera image while adjusting focus:

- 1> Lift up the scan head

The position of the cantilever in the camera image now shifts (Fig. 5).

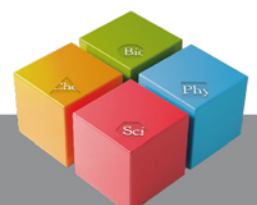




Fig. 5 Scan head not pushed against the scan head cover

- 2> Use your thumb and index finger to press the scan head toward the lid (Fig. 4) until cantilever is again in the normal camera position (Fig ...)

### CAUTION !

Do not press on the lens cover and the cantilever mount.

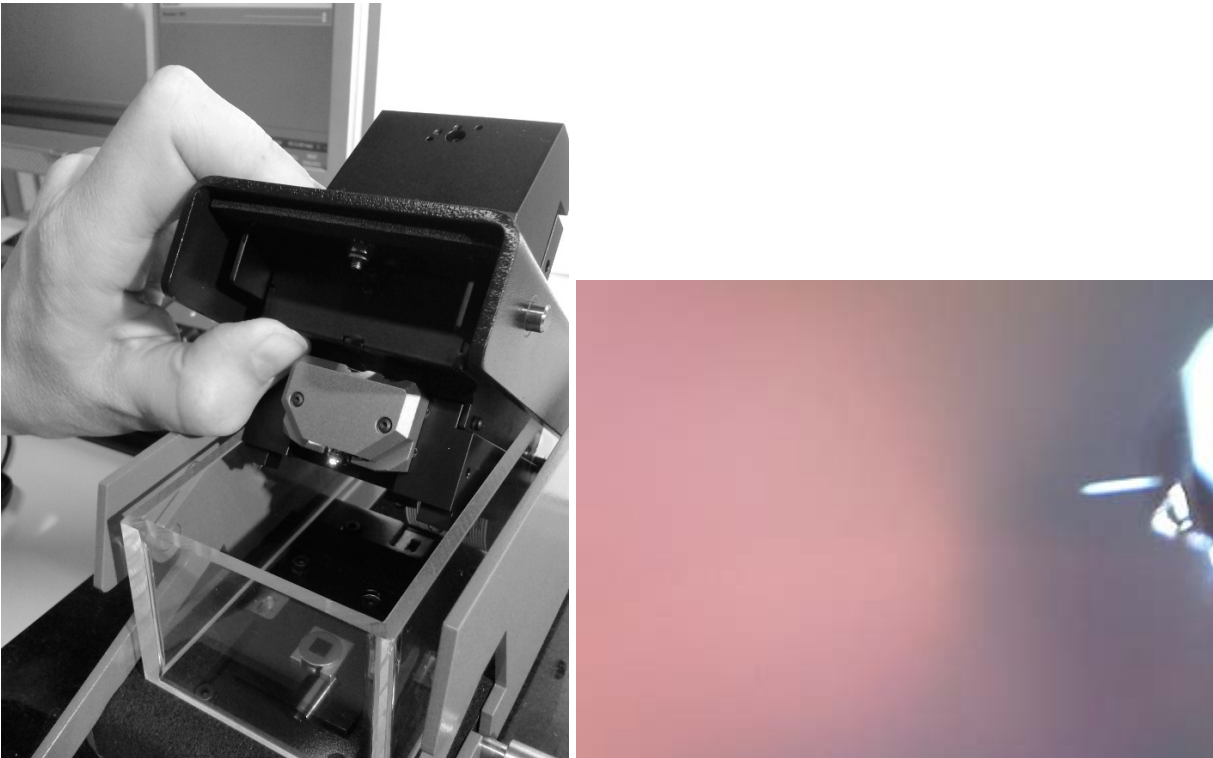
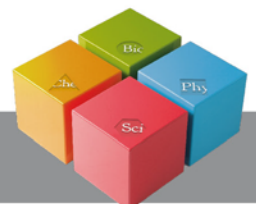


Fig. 6, left: Use thumb and index finger to push the scan head unit against the scan head cover, right: cantilever image with scan head gently pushed against the scan head cover

- 3> Use the special octagon socket tool supplied with the compact AFM camera to adjust focus position of the lens by turning the right lens/screw with the other hand (Fig. 8, encircled)



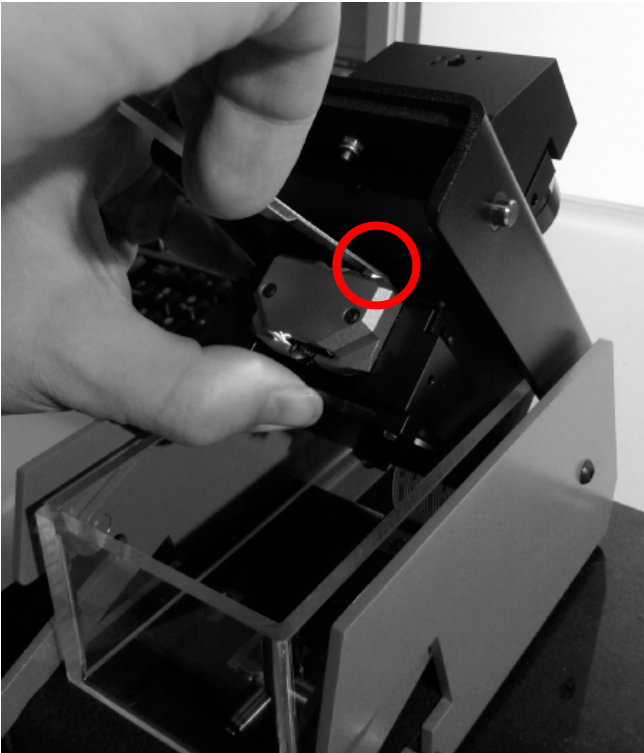


Fig. 7 Adjusting the focus position with the provided tool.

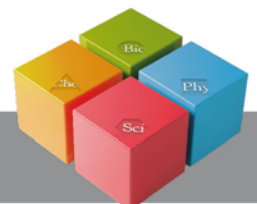
- 4> If the focus is too high, screw the lens into the lens cover (clockwise rotation) If the focus is too low, screw the lens out of the lens cover (counter clockwise rotation).
- 5> Press the scan head back into the lock position and check if the cantilever is in focus.
- 6> If necessary, lift the scan head and repeat the adjustment step.

## 2. Adjusting Focus, rotation and alignment of the camera

### Adjusting focus and rotation

When the focus of the lens cover is approximately correct, the focus of the camera can more easily be adjusted by moving the camera sensor unit back and forth on its mount. To adjust the focus with the camera:

- 1> Loosen the screw on the side of the camera (Fig. 9)





*Fig. 9 Loosening of the camera sensor unit.*

- 2> Move the sensor unit of the camera back and forth to adjust the focus.

If it is not possible to move the camera further inwards to focus the image, adjust the focus of the lens cover up by at least half a turn.

- 3> If necessary, adjust the camera rotation so that the short axis of the camera image is parallel to the cantilever.

### Adjusting the image position

The visualized area of the sample can be shifted by adjusting a mirror. To adjust the mirror, you need a 0.89 mm Allen key. In current deliveries of the camera, this Allen key is included. In early deliveries of the camera, it may not be. To adjust the camera:

- 1> Turn the two screws indicated in Fig. 10 to get the desired view of the sample.

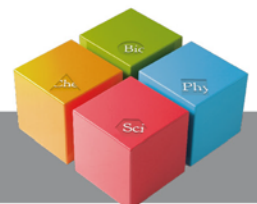




Fig. 10 Adjustment of the visible area.

