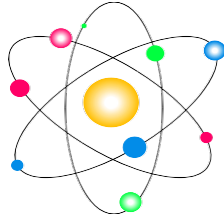
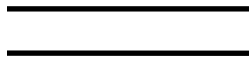


SERVICE



PHYSICS

## Installation of SPI HD video camera on SSL ESCA instruments

### Install camera on vacuum system

1. Remove existing microscope from top hat.
2. Shut valve between main chamber and pump.
3. Turn off main chamber vacuum gauge. Ensure the interlock has shut down all electronics.
4. Place a sample with a straight edge on the rotary sample holder. Move the sample left and right with the sample stage. Adjust rotation so the cross hair in the microscope tracks along a straight edge of the sample
5. Back fill main chamber with N<sub>2</sub>.
6. Remove microscope and glass viewport used by the microscope.
7. The camera is mounted in a tube that has a glass window welded at the end that extends into the vacuum chamber. **HANDEL WITH GREAT CARE!** The 2.75" CFF is attached to the opposite end of the tube. The 2.75" flange is bolted to the top port of the adjustable 4.5" rotatable flange. Do not remove.
8. The 4.5 rotatable flange allows the orientation of the camera to be adjusted so the top of the computer display is the back of the instrument. Left/right are matched to the instrument left/right when you are facing the instrument.
9. To make the above orientation adjustment place all 8 bolts into the 4.5" flange ring, **FINGER TIGHT THEN BACK OUT ¼ turn**. This leave the camera mount free for rotation. Plug the camera into the computer USB port. If using windows 10 select the windows Camera icon. You will see the HD video Camera displayed. Move the stage left and right. Rotate the camera mount to align the camera with the vacuum chamber X axis. Slightly tighten the 8 bolts one at a time moving from bolt to bolt in a star pattern. It should take 5-8 time around the flange. Don't use any more force than you can provide with three fingers.
10. The lighting system is operated form a wall mounted 5volt supply. The brightness control operates a LED light ring at the end of the camera lens. A second light ring is provided for use on any free 2.75" port that has a window.

## Additional Adjustments

### XY Adjustments

1. The XY adjustment wheels are found at the bottom of the camera body. The wheel on the front will tilt the camera lens and detector in the Y direction. The wheel on the side will tilt the camera lens and detector in the X direction. The motions are small, the camera lens runs into the light ring.

### Focus Adjustments

1. The camera's depth of field is a few centimeters. The best sample Z position must be determined by max counts. The Camera provides a cross hair for XY location. The best procedure is to use a phosphor sample. Turn on the flood gun to provide a good signal. Operate with the 600-micron spot at res 4. Collect unscanned signal at 532 eV BE.

Maximize the signal by adjusting the Z axis. In the computer display locate the button to turn on the cross hair. Then move the cursor to the center of the x-ray spot and right mouse click. This will move the cross hair to the location of the cursor.

2. If the camera is clearly out of focus at max counts, adjust the sample height to bring the image into focus. Keep track at the distance you moved. This may be by the number of turns of the stage adjustment or by noting the change in the z readout in the Motion Control Panel read out. One turn of the Stage drive is 0.10 inches. Be sure and note if you moved away from the sample or toward the sample.

3. Camera removal. You can remove the camera from the mount by removing three screws that attach the camera to the 2.75" flange. Lift the camera out of the holder slowly. A pair of wires go from the camera body to the light ring at the bottom of the tube. Use a gloved hand and put your index finger in the center ring of the light ring. The gloved end of your finger will touch the window. By pulling the tip of your finger back to make a small hook you can lift the ring. It will not move fast. Be careful, do not tug on the two electrical wires. Do not use tools.

4. Lens adjustment. The lens is mounted in a small barrel that is threaded. There are two flats on the side of the barrel. The flats fit a 9mm end wrench. If you need to move the focal point away from the camera screw the lens in. If you need to move the focus toward the camera screw the lens out.

1 turn of the lens = 0.5 inch change in focal distance. This is true for the 2.8" design distance between sample and camera lens.

Very small change in lens position is needed to correct for typical differences between instruments.