

Technical Solutions

Shamrock Wavelength Calibration

Products Affected – All Shamrock Spectrographs
Software Affected – All Solis

Description or Error: Spectra appear offset (shifted) from where the peak is expected. Generally this can happen after re-attaching a camera or changing the grating turret. When this happens, the wavelength drive requires re-calibration using the following method.

The Offset Adjustment Control (*Figure 1*) allows the user to adjust the position of the wavelength motor drive to correct for any shift in the spectra. Detector or grating offset adjustment is selected via the tabs on the Offset Adjustment Control (this can be added to the Shamrock panel from *Display >> Offset Adjustment*).

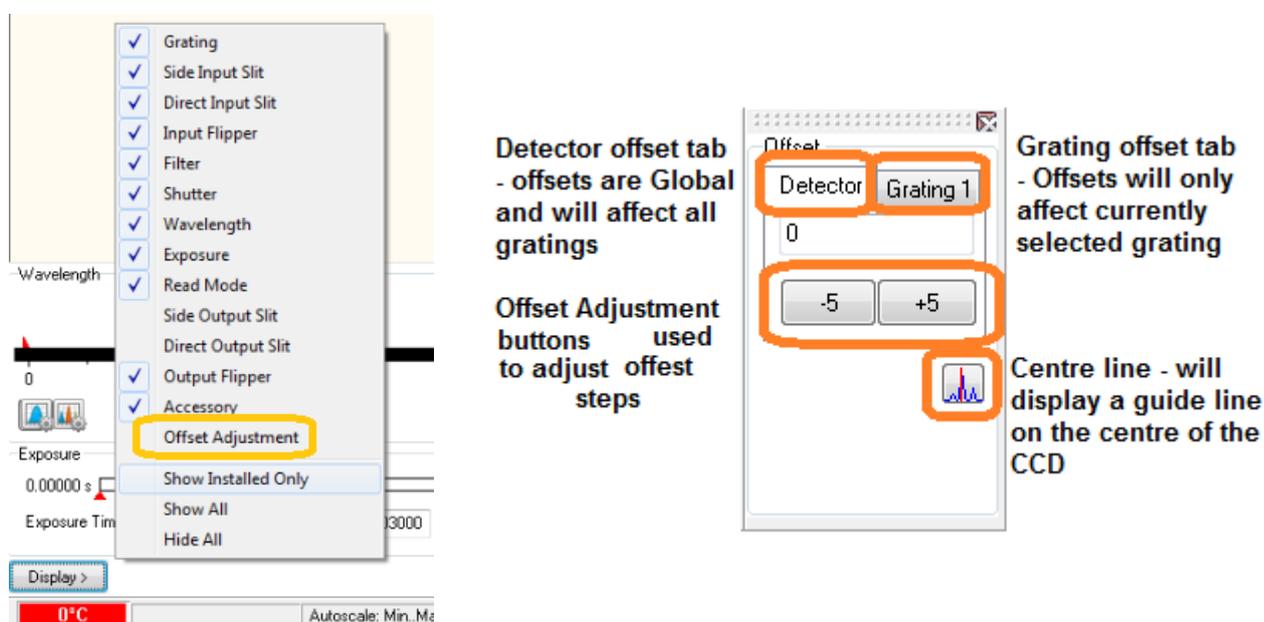


Figure 1: Detector and Grating Offset Adjustment Control

The *Detector offset* value can be adjusted to correct for any mechanical change that shifts (offsets) the displayed spectrum from the expected calibrated position. For example, if a camera is removed and refitted, or a grating turret is removed and refitted there will most likely be a small mechanical change in the exact re-positioning of the component. Any Detector offset introduced will be 'global', i.e. any offset will be independent of the grating being used and will apply to all gratings.

The *Grating offset* values are used to correct for any shift between the displayed spectra from the expected calibrated position and will only apply to the currently selected grating. The grating offsets are normally only adjusted when a new grating turret is installed or upon initial setup.

Adjustment Procedure

The following describes the procedure for the detector offset adjustment but the grating offset adjustments are performed in the same manner.

1. If the offset adjustment control is not already displayed press the Display button and select the offset adjustment control. Click the Detector tab on the offset adjustment control.
2. Set a low-pressure mercury (Hg) pen-ray, or Neon (Ne) lamp (or similar calibrated light source) at the entrance slit of the system.
3. Set the entrance slit width to 10um and select the centre wavelength as a known spectral peak. Eg, the Hg 546.07 or 435.83nm line or the Ne 703.24nm line.
4. Acquire data. The target line should appear close to the centre of the display. Pressing the centre line button on the offset adjustment control will draw a red line on the centre CCD column of the display and serves as a useful aid to offset adjustment (see figure 2 below).
5. If the spectral line is positioned on the centre line then an adjustment to the detector offset value is not required. If there is a discrepancy between the displayed centre wavelength and the actual wavelength position of the spectral line the offset should be adjusted.
6. Press the appropriate + or - offset adjustment buttons to bring the centre of the spectral line onto the red centre line. The adjustment step size may be selected from a drop down list (right-click either of the keys).

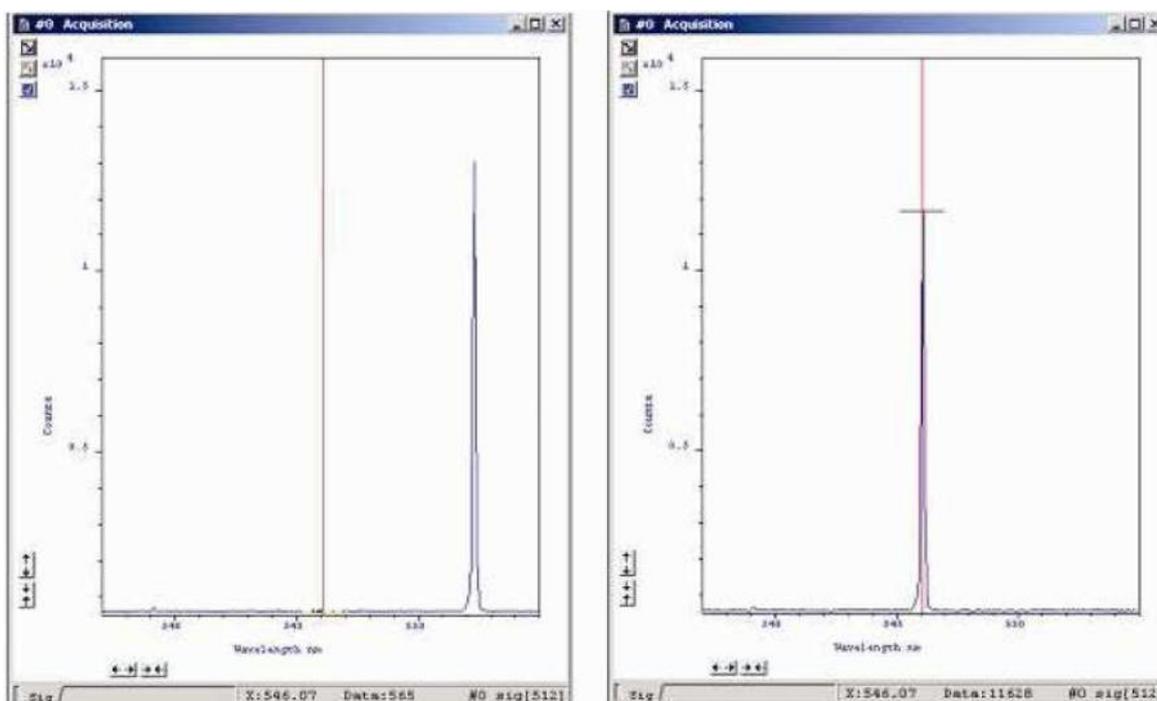


Figure 2: Spectra acquired before (left) & after (right) Detector Offset Adjustment

When complete, the Shamrock EEPROM is automatically updated with the new Offset values and will be applied each time the spectrograph powers on.