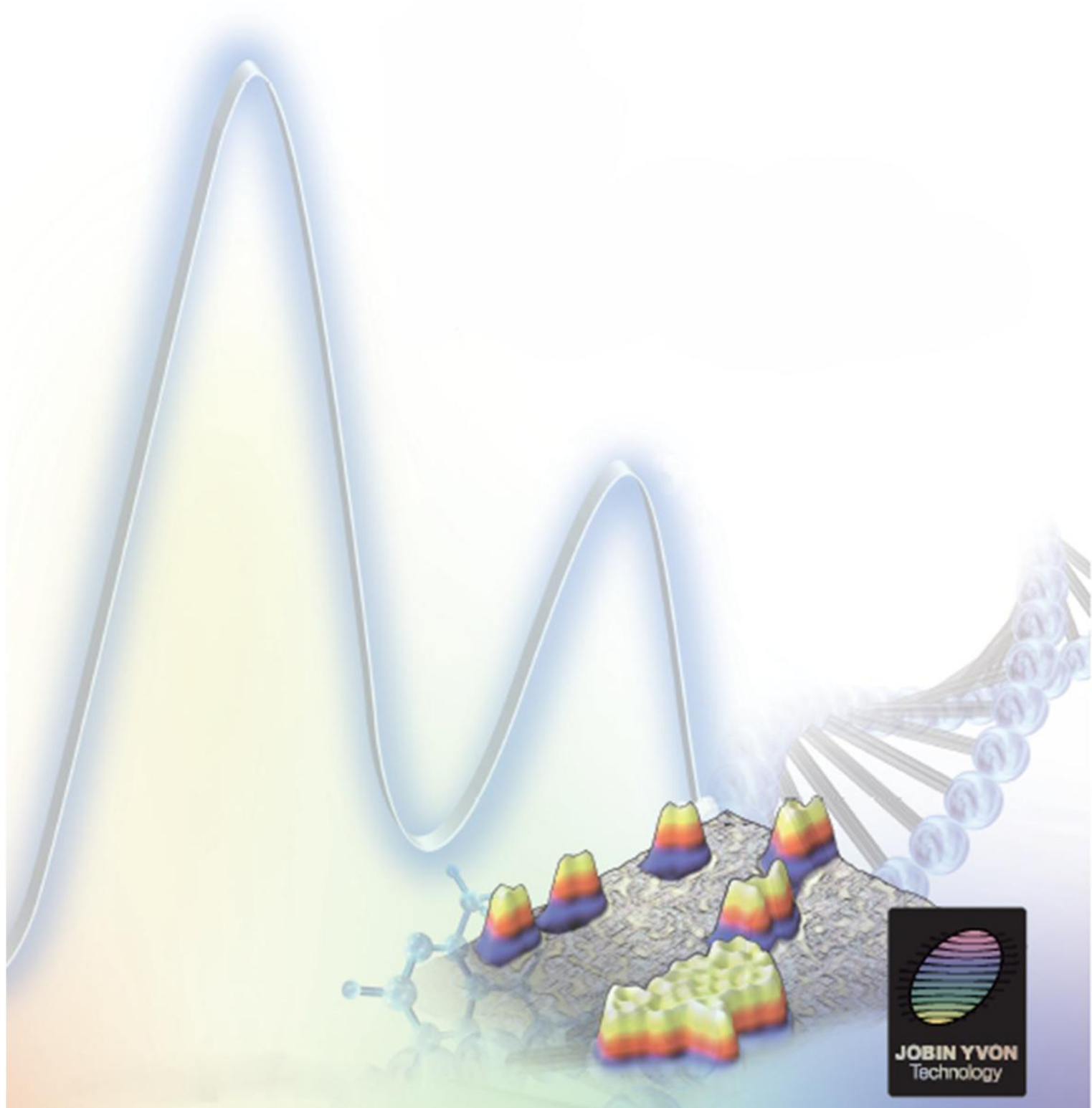




Quick Start Guide

AutoFocus





Quick Start Guide

This Quick Start Guide is intended to provide a basic introductory user guide. It is not exhaustive in content, and should only be used in conjunction with user training and other guidance provided by your HORIBA Scientific service engineer.

Introduction

The Autofocus function in LabSpec 5 automatically finds the optimum focus position for a sample, and ensures that the best quality spectrum with maximum signal level can be easily achieved.

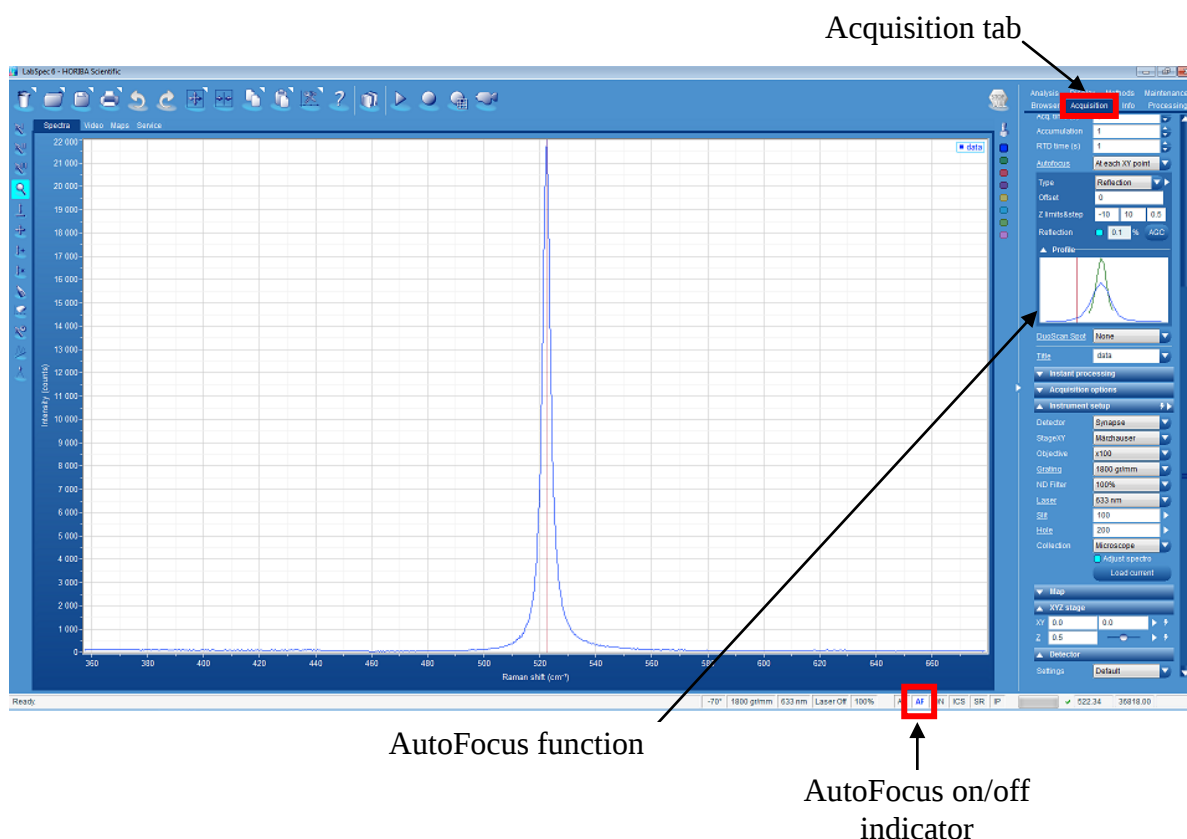
It is a useful tool for samples where manual focusing is difficult (such as highly polished, clean surfaces). So long as the sample is relatively close to focus the Autofocus procedure will find the correct focus position and give a good quality spectrum.

Autofocus also is invaluable when acquiring XY surface maps of samples which have significant surface roughness. Without autofocus whenever the measurement position in the map is out of focus the signal level will be reduced, and analysis of the map data will be difficult. With the autofocus running, the focus position will be adjusted at each measurement position in the map, ensuring that good quality data is acquired across the full mapping area, despite the sample's inherent roughness.

The Autofocus procedure uses a software controlled motor to control the microscope focus. The focus position is adjusted in small increments whilst monitoring a signal from the sample. The sample signal is maximum at the focus position, and thus the focus adjustment is made iteratively until the maximum signal is observed. At this point, the Raman measurement is made.

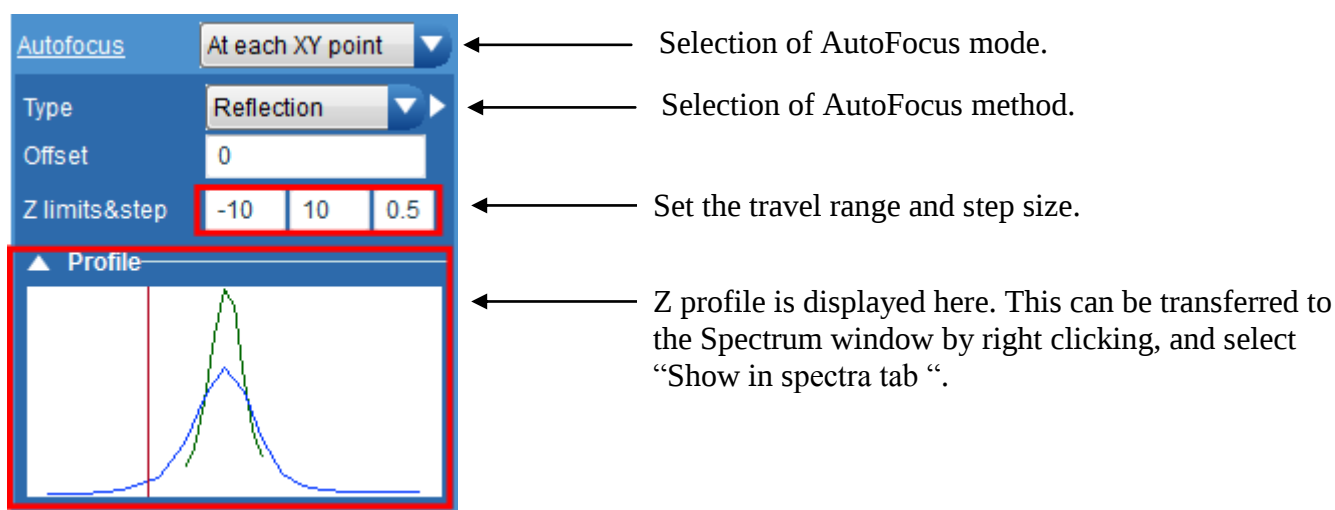


How to use AutoFocus



AutoFocus control and configuration is located in the Acquisition Parameters section of the Acquisition right hand tab.

Left click on the Autofocus title to open up the configuration window.





1, Sample setting

- Position the sample on the microscope sample stage.
- Focus the sample as well as possible.

2, Selection of Autofocus mode

There are four modes available. Choose the desired method.

- **Off** : AutoFocus is not used.
- **At each XY point**: AutoFocus is used at every XY point in a Raman map.
- **At start**: AutoFocus is used at the starting position of the measurement only. For a Raman map this means that a single AutoFocus procedure will take place at the first point of the map.
- **Tilt**: This is for mapping smooth samples which are tilted. AutoFocus reference positions are calculated at the four corners of the map area, and the tilt is calculated. The sample focus position is adjusted throughout the map acquisition to ensure good focus.

3, Selection of AutoFocus method

There are two methods available.. Choose the desired method.

- **Reflection**: this method monitors the Raman laser beam with a reflection detector; the optics are set up so that maximum signal is detected when the sample surface is at focus.
- **Spectral**: this method directly monitors the Raman spectrum intensity detected in the normal way. The focus point is chosen to be where the Raman spectrum intensity is greatest.

4, Input the travel range and step size.

The travel range is set with “From” and “To” values. The range should cover the expected focusing distance required for the sample. The larger the range the longer the AutoFocus procedure will take.

- Negative (-) values are above the current position (i.e., the distance between sample and objective is increased).
- Positive (+) values are below the current position (i.e., the distance between sample and objective is decreased).

※Be careful. If the positive (+) part of the travel range is set larger than the working distance of the objective the sample and objective will come into contact. This could cause damage to the objective and the sample.

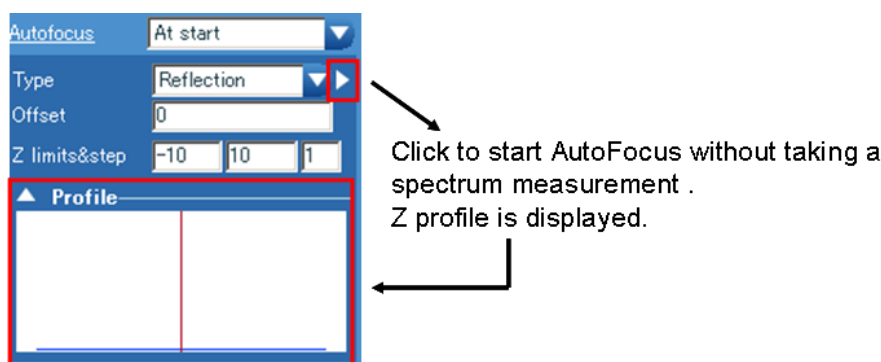


The step size should be chosen with consideration of the precision required for AutoFocus. The smaller the step the longer the AutoFocus procedure will take.

5, Start the measurement

In order to start the measurement using AutoFocus, just click  (Acquire Spectrum) or  (Acquire Map) after setting 1~4.

It is possible to run AutoFocus without taking a spectrum measurement using  in the AutoFocus section.



[Troubleshooting]

If AutoFocus doesn't work properly, check the following points.

- Confirm the Z stage is working correctly.
- The input travel range (step 4) must be large enough to reach the focus point. If the sample focus point is not within the travel range then AutoFocus will not succeed.
- If using the Spectral method check the spectrum acquisition conditions (spectral position, laser wavelength etc) are suitable to acquire a good spectrum.
- If using the Reflection method check that the reflection diode is switched on and connected.