Renishaw plc
Spectroscopy Products Division
New Mills, Wotton-under-Edge,
Gloucestershire GL12 8JR
United Kingdom

Tel +44 (0) 1453 524524
Email raman@renishaw.com

www.renishaw.com

RENISHAW
apply innovation™

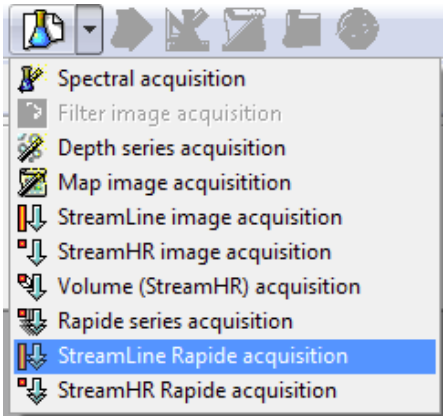
TM029 - StreamHR Rapide imaging WiRE™ 5

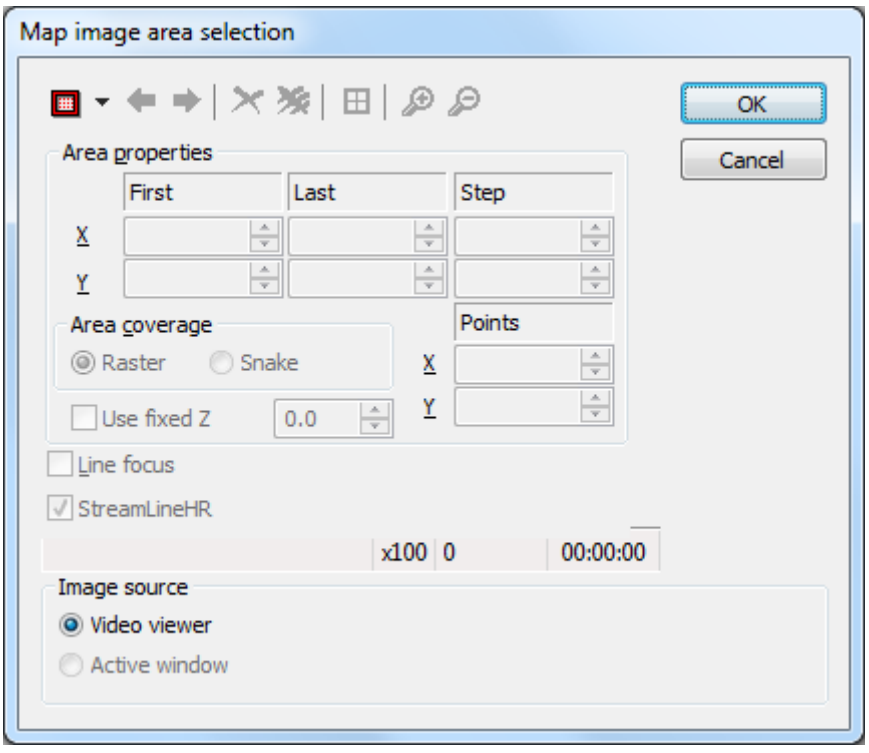
This document aims to show the WiRE™ 5 user how to use the StreamHR Rapide fast imaging mode in conjunction with the Andor EM-CCD detector. It assumes the appropriate password has been entered and that all necessary hardware is present which enables the capability.

StreamHR Rapide imaging

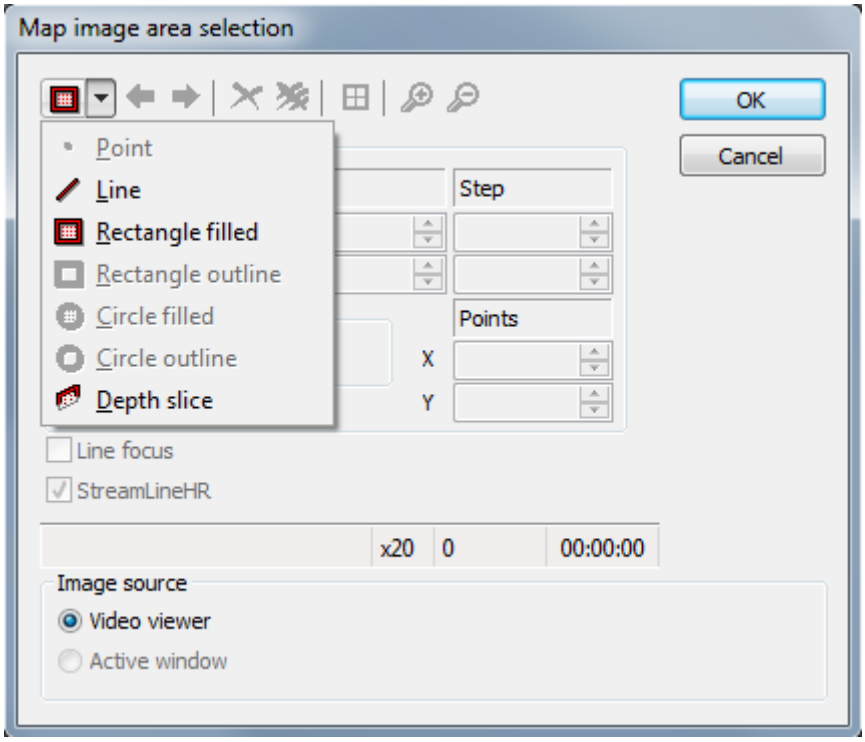
Ensure that a suitable system configuration has been selected from the **Sample Review** toolbar (this must be a spot focus laser with no line focus lens, and the Andor detector). Do not use 'Linefocus' or StreamLine imaging laser types or the RenCam detector type).

1. Select **Measurement….New…StreamHR image acquisition** to initiate the Map Image window.



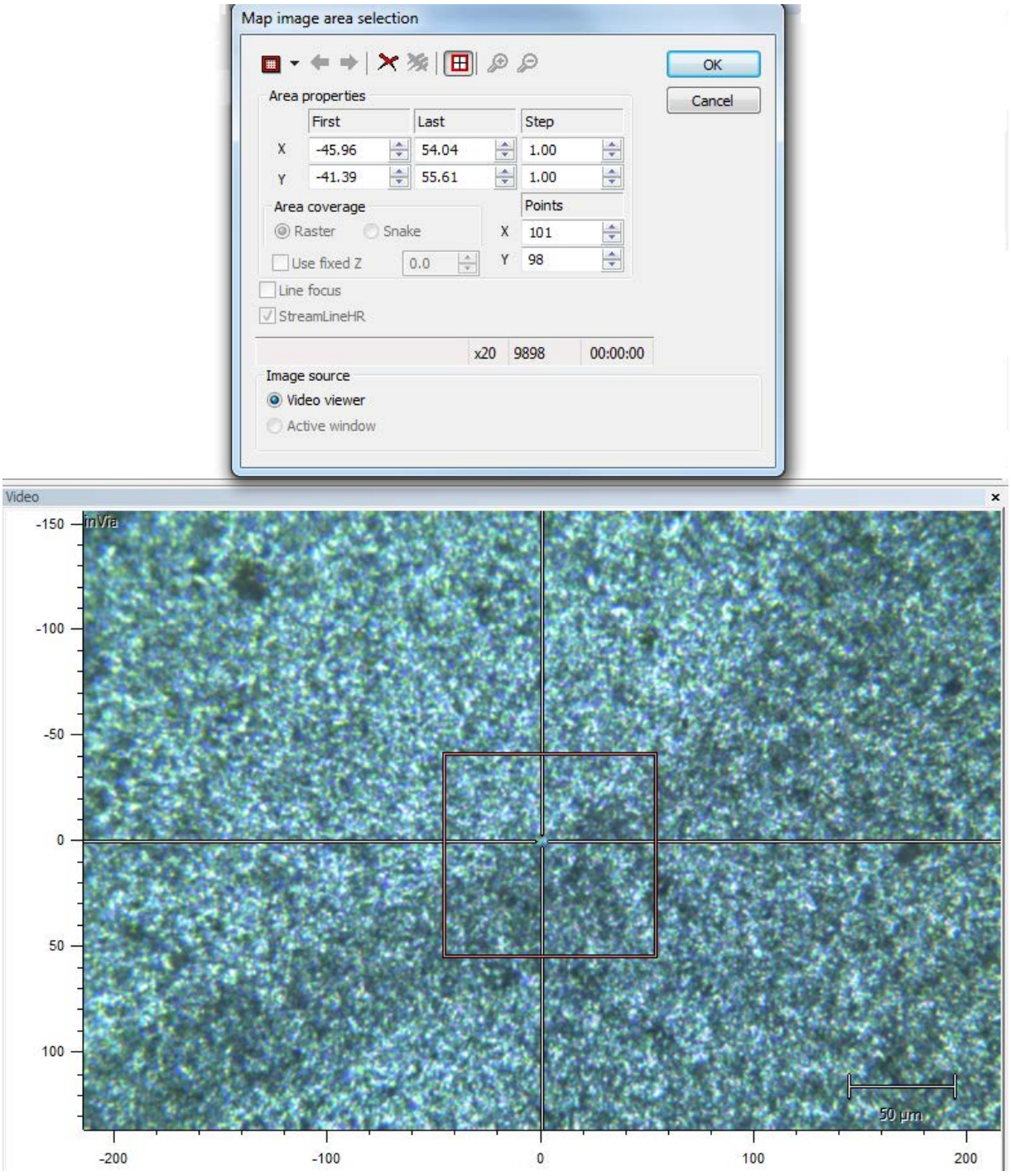


2. Use the **filled rectangle only (**do not use any other area selection type) to define the mapping area on the live video image (displayed within the video viewer), or snap / montage image (displayed within the still image viewer):



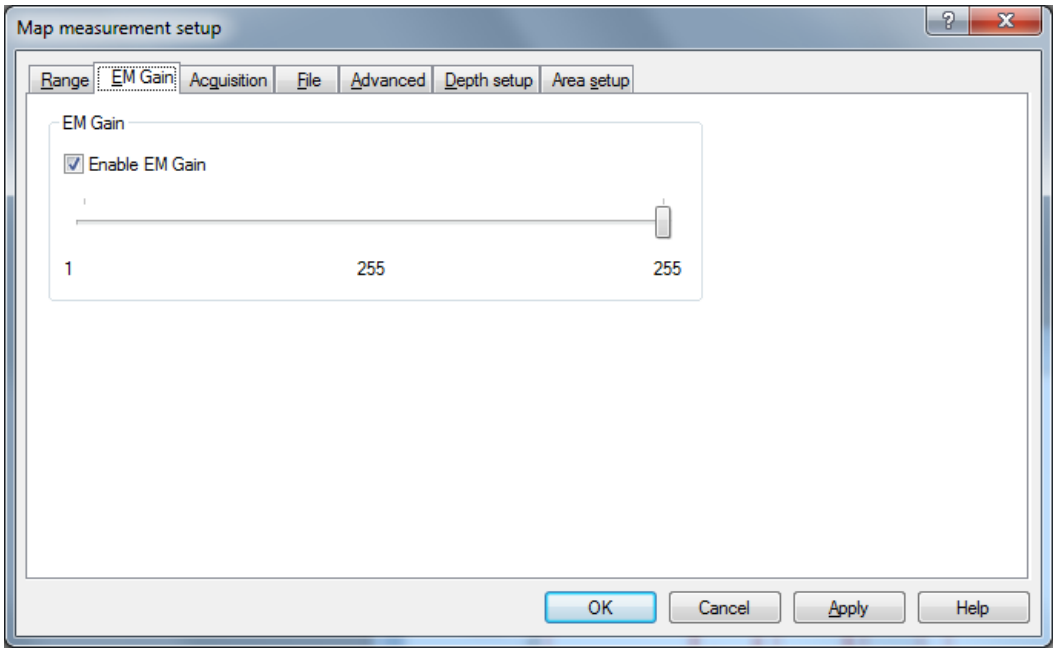
The first and last XY co-ordinates can be adjusted by typing directly into the boxes. The XY step sizes can be altered in the Map Image window. The default XY step size is 1 µm. However, a minimum step size of 0.1 µm (100 nm) can be used in conjunction with the Renishaw High Speed Encoded Stage (HSES).

StreamHR only supports the Raster direction pattern for map data acquisition.

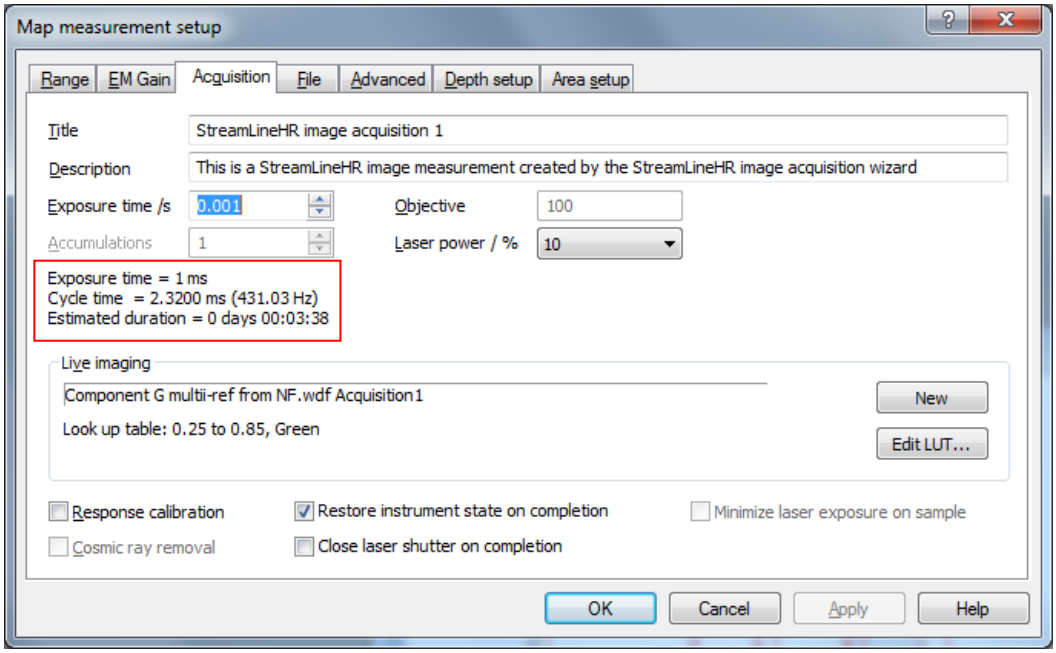


3. When the collection area is defined, and **OK** is pressed, the Map Measurement Setup window is activated. The **Range**, **File**, and **Advanced** tabs will be familiar to the user as they are identical to those that appear in the general Spectral Acquisition setup. A new **EM** tab is displayed which enables the user to use the electron multiplication functionality of the detector, and select the EM gain value.

   EM gain is controlled manually. Setting the gain level too high may result in saturation of signal and associated artefacts. The gain control has a non-linear scale. Refer to the detector manual for further information.



The **Acquisition** provides additional information regarding the data collection rate during StreamHR Rapide.



Exposure time is the amount of time signal is acquired from that specific point of the sample.

Cycle time is the rate at which the signal is being collected by the detector.
(Note this may not be the same as the rate at which data is shown in the WIRE software).

The **Area setup** tab allows the user to review the map area settings i.e. co-ordinates, and XY step sizes.

4. Use the ‘Range’ tab to set the centre position of the scan (the spectral range and spectral resolution will depend on the laser wavelength, grating groove density and detector type).

5. Use the ‘Acquisition’ tab to select the exposure time and laser power to be used. StreamHR Rapide has a minimum exposure time of 0.001 s (1 ms).

   (Note a value of 0 s can be entered which will provide a sub-ms exposure time which is not
   accurately quantified or recorded.)

6. Select the 'close laser shutter on completion' option.

7. Go to the 'File' tab and define the filename and location (ensure the file is saved only to the local hard drive). Select the 'Auto increment' option to ensure the data cannot be overwritten.

8. Once **OK** is pressed, the mapping measurement can be started using the  button.

   A new viewer opens with the base image on the left, and the spectrum acquired at each point on the right hand side. The lower portion of the window gives information on the current acquisition and time remaining for the measurement to complete.

9. Once map data collection has finished, a Map Review window opens showing the base white light image and the spectrum corresponding to the current cursor position.
   (Tip: On loading a saved map dataset, this view can be regained by selecting **View…View map data**).

It is possible to recover files which have not been saved for a period of up to 7 days (see module TM18).