

# temDM

## temDM scan2D

**Installation:** The plugins temDM scan2D.gtk“ and „temDM ExtFrames.gt3“ should be placed in some plugins folder of DigitalMicrograph.

The script „find plugins folders.s“ included in the distribution package will help you to localize such folders. Open „find plugins folders.s“ in DigitalMicrograph and run it by pressing „execute“ or by pressing **ENTER** with holding the **CNTR** key. Read the list of available plugins folders. The first folder in the list is most appropriated for placing the temDM plugins.

Some folders can be hidden in Windows. If you do not see all folders, make them visible in Windows explorer:

**Windows 7:** „Organize“ tab – „Folders and search options“ – „View“ tab – click „show hidden files, folders and drivers“ checkbox.

**Window 10:** „View“ tab – click „hidden items“ checkbox.

Drop the plugins into the chosen Plugins folder.

Restart DigitalMicrograph.

To update the version, just overwrite the plugin of the previous version in the Plugins folder. This is needed to avoid confusion of DigitalMicrograph with loading ambiguous commands.

**Alternatively**, you can install the script manually in DigitalMicrograph.

Having „extended frames classes.s“ frontmost click: **“File” – “Install script”- “Library”-“OK”**

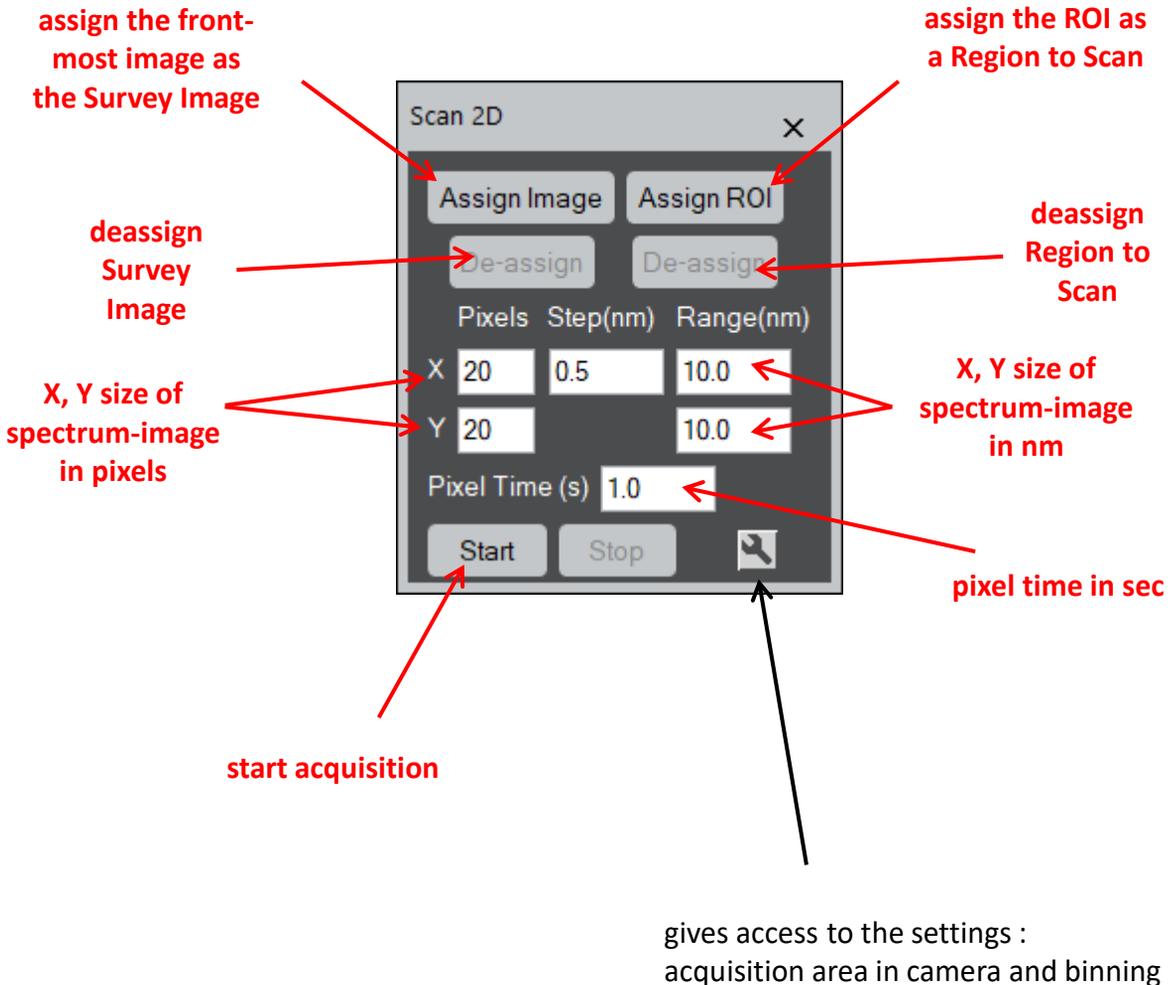
Having „scanning2D interface.s“ frontmost click: **“File” – “Install script”- “Library”-“OK”**

Having „scanning2D.s“ frontmost click: **“File” – “Install script”- “Menu command”-“OK”**

In this way, you can modify the text of the script.

**This plugin is primarily aimed for an in-line DigitalMicrograph directly connected with a TEM microscope. However, it is fully functional in an off-line DigitalMicrograph where the plugin „temDM VirtualTEM.gtk “ is installed.**

## Short description



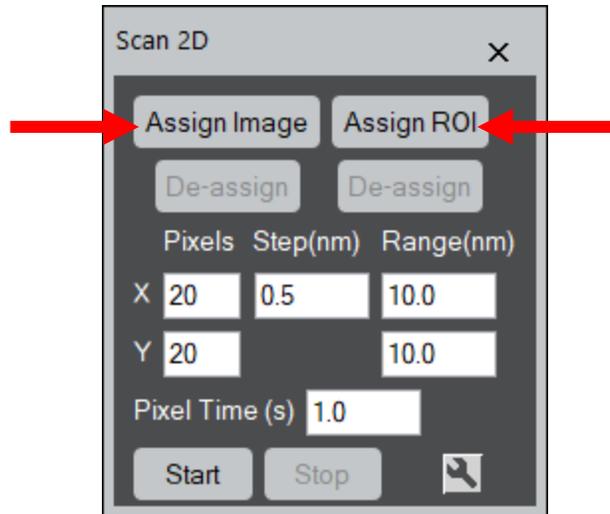
This tool mimics the spectrum-imaging tool of DigitalMicrograph with the only difference that it outputs 2D spectra instead of 1D. Thus, you can collect, e.g. a spectrum-image of q-E (momentum transfer on vertical axis, energy on horizontal axis) EELS map. Or, you can make an image where each pixel is equipped with a diffraction pattern (4D STEM).

**Thus, if you have experience with Gatan spectrum-imaging tool, you automatically know how the temDM scan2D tool works.**

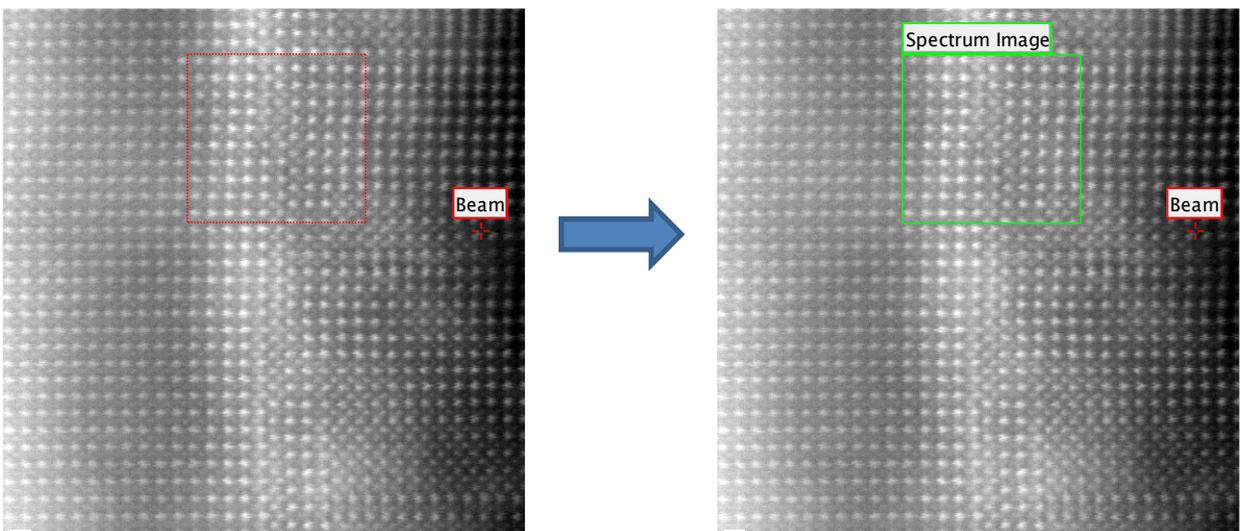
In case you never operated Gatan Gatan spectrum-imaging tool, read the instruction below

## How it works:

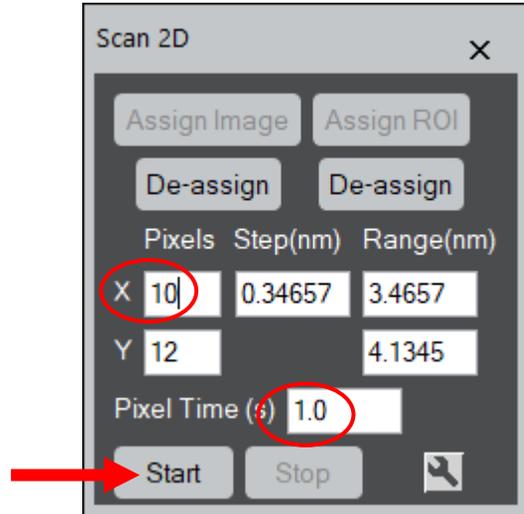
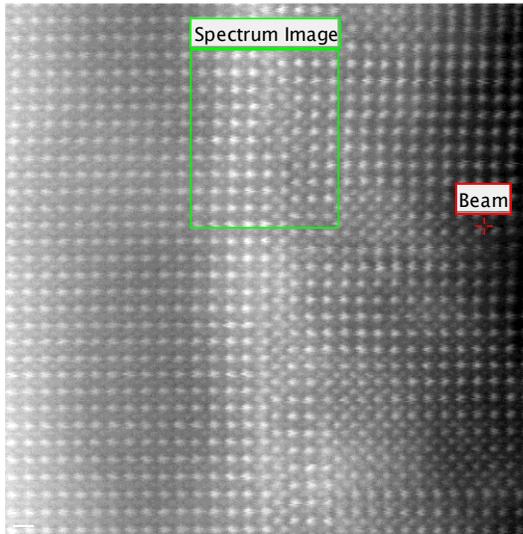
*First of all: the temDM scan2D tool requires Gatan DigiScan installed.*



- Click **assign image** button to assign the front-most image as the Survey Image. The image should be a STEM image collected with DigiScan. The script will generate an error message if it is not the case. You can always click **de-assign** button to de-assign the current image and choose another one.
- Draw a ROI in the Survey Image and click **assign ROI** button. The ROI color will change for green.



- Change the position and size of your ROI such as it covers the region you want to scan.
- Set the number of desired pixel along the X axis. The number of Y-pixels will be live changed according the proportions of your ROI. You can also note how the range (in nm) and step size change live when you are changing your ROI.



- Type the desired acquisition time in Pixel Time (s) field.
- Press Start button..You can anytime stop scanning by pressing Stop.
- Scanning is proceed. The current live image will be continuously updated.
- At the end, you get a kind of data cube.

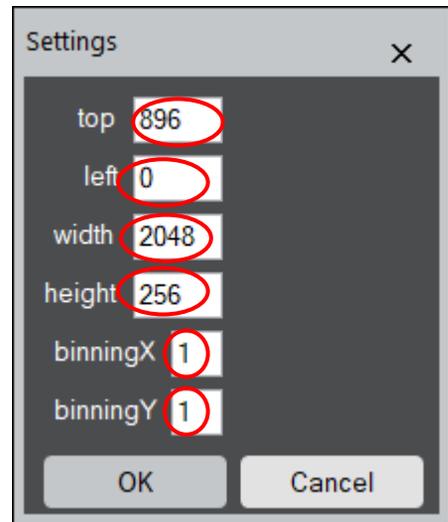
**ATTENTION:**

The format of this datacube is different from what you are used in the Gatan spectrum-image tool. The X,Y corresponds to the coordinates in the camera while the pixel index is changing along the Z-axis.

You finally may convert this data cube to the 4D hyper cube by running “convert 4Dcube” script included into the distribution package.

## Settings:

- Set the acquisition region at your camera.
- As the data size can be dramatically large, it is sometimes good to apply binning



### **WARNING:**

This acquisition coordinates (top, left, bottom, right) indicate exactly the acquisition area in the camera. The corresponding setting in DigitalMicrograph can be different as the different versions use different conventions. Always check the acquisition region before scanning.

### **WARNING:**

This tool uses scripting, therefore the communication with hardware is slow compared to the generic Gatan tools. It works with the significant overhead among pixels.