

# DELTA VISION ULTRA WIDEFIELD

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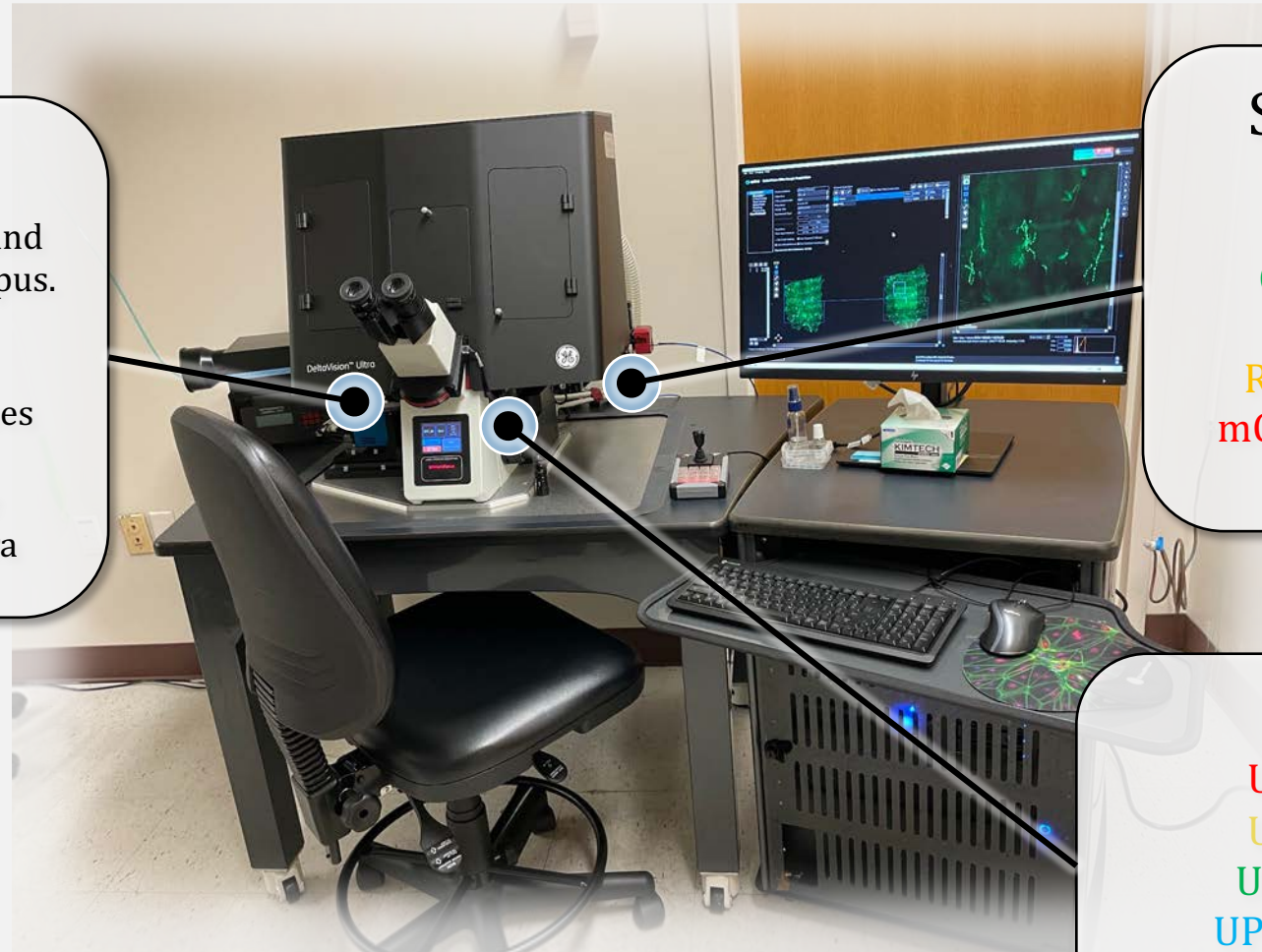
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## Microscope

The DeltaVision is built around an inverted stand from Olympus.

- Motorized XYZ stage
- Ultimate Focus
- Three (3) multi-color cubes
  - DIC optics
- Full Live Cell enclosure
- PCO-Edge sCMOS Camera



## Supported Dyes

DAPI/Hoechst/BFP  
 CFP/Cerulean  
 GFP/FITC/Cy2/AF488  
 YFP/Venus  
 RFP/TRITC/Cy3/AF546  
 mCherry/TexasRed/AF568  
 Cy5/AF647

## Optics

UPlanS Apo 4x/0.16  
 UPlanS Apo 10x/0.4  
 UPlanS Apo 20x/0.75  
 UPlan FLN 40x/1.3 (oil)  
 Plan ApoN 60x/1.42 (oil)  
 UPlanS Apo 100x/1.4 (oil)

## Software Overview

The Deltavision Ultra runs in **Acquire Ultra** software, though post-acquisition viewing, processing, and analysis is performed in **Softworx**. The Acquire Ultra software allows for multi-dimensional experiments, including Multi-channel, Z-stacking, Timelapse imaging, Multi-point visiting, and large region stitching. The interface features a stage overview, live view, and guided experimental setup.

The screenshot displays the Acquire Ultra software interface, which is divided into several key sections:

- Experimental Setup:** This section on the left contains configuration options for the experiment. It includes fields for Protocol Name (Default Protocol), Objective (10x\_ar), Z Touchdown List (Slide), Polychroic (B-G-R-FR), Image Size (2040x2040), Experiment Type (2D), Sample Thickness (0.00), Z Section Spacing (0.20), Total Time (h: 0 m: 0 s: 0.000), and Time-lapse Interval (h: 0 m: 0 s: 0.000). It also features checkboxes for Do Point Visiting, Use Channel Z Offsets, Use UltimateFocus, and Use Contrast Autofocus. A blue callout box labeled "Experimental Setup" is overlaid on this area.
- Channel Selection:** This section on the right allows for selecting and configuring imaging channels. It shows "Green" and "Blue" channels with their respective filter wheel positions (0.050) and exposure times (10%). A blue callout box labeled "Experimental Setup" is overlaid on this area.
- Stage Preview:** This section at the bottom left provides a top-down view of the sample stage. It shows a grid of green fluorescent spots and a white box indicating the current field of view. A blue callout box labeled "Stage preview" is overlaid on this area.
- Live View:** This section on the right shows a real-time image of the sample, which appears as a green fluorescent structure. It includes a vertical Z-axis scale on the right side, ranging from 2.00 to 2.00. A blue callout box labeled "Live View" is overlaid on this area.

At the bottom of the interface, there is a status bar with the text "Contrast AF moved 15.56 microns. Lens changed to: 10x\_ar".

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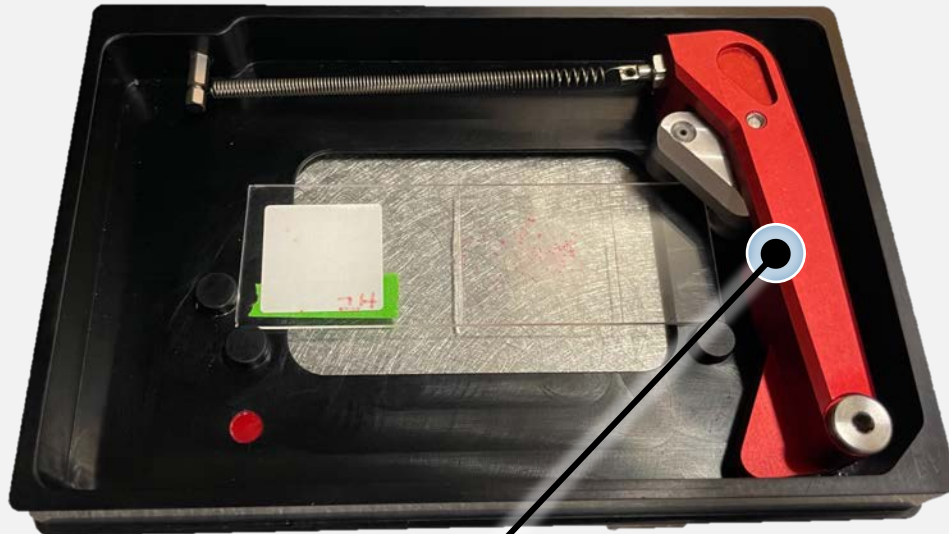
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Sample Finding and Focus

A. Stage Placement

The Universal Stage Adapter can accommodate

- Slides
- 35mm dishes
- Multi-well chambers



Spring-loaded arm

Joystick can control Stage (XY)



Widefield Shutter

Transmitted Shutter

The stage accepts a multi-well plate format directly

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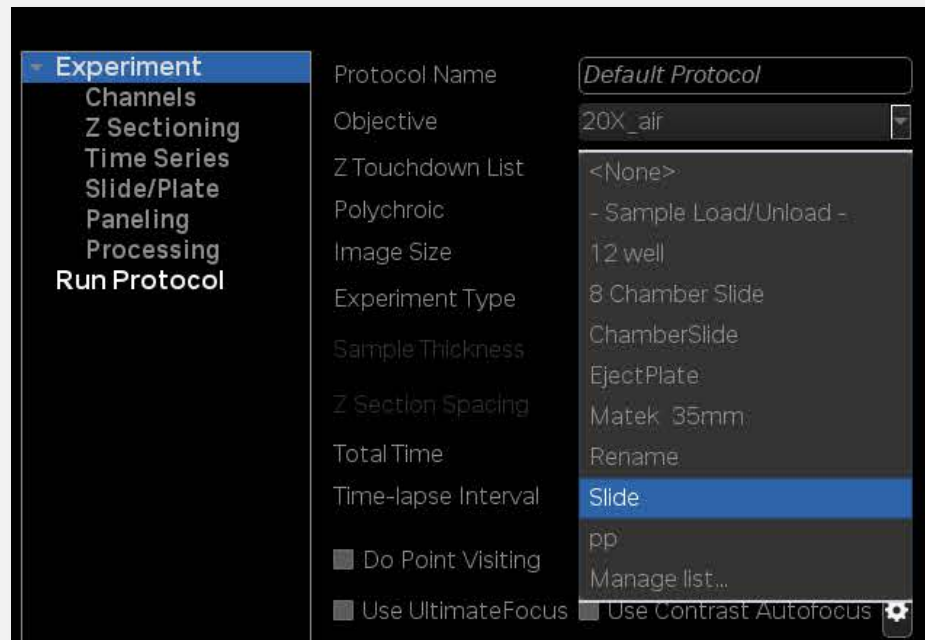
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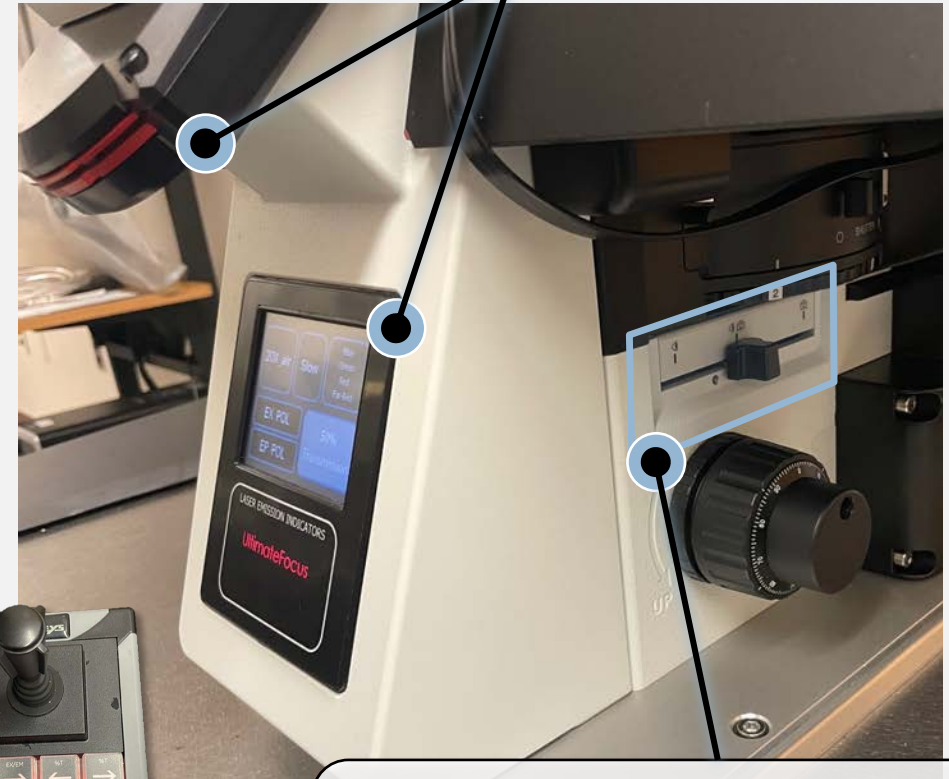
Sample Finding and Focus

B. Eyeport Viewing

Once the sample is on, you must bring it into focus. There are focus presets in the main **Experiment Setup window.**

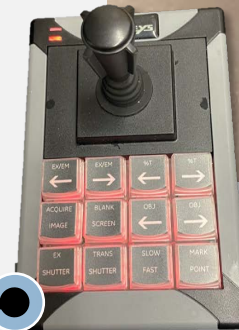


When viewing through the EYEPIECES, select which color you're viewing with the **RED Wheel** under the eyepieces. The current filter set is displayed on the microscope front screen



To view the sample with your eyes AND the camera, be sure the **lightpath slider** is in the middle position

Widefield Shutter



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Single Point View



Mark Location

Autofocus

Set Stack Limits

Stack Navigation

Manual Focus Steps

Focus Position

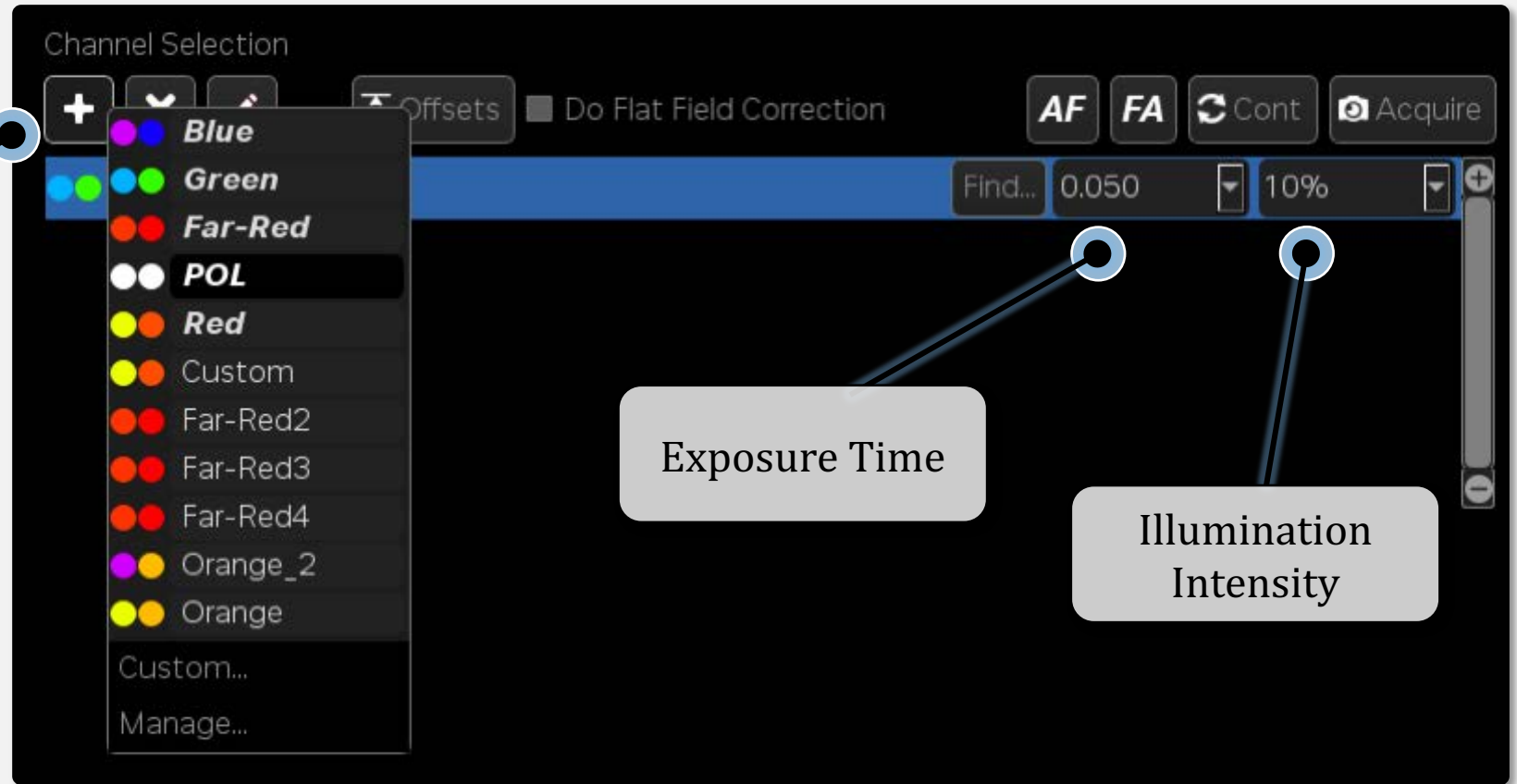
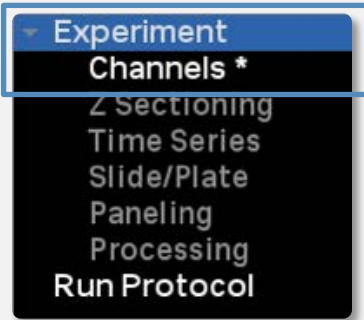
Single View Display Rescaling

# Channel Settings

Adding channels to an acquisition is done through either the **Main Experiment Setup** or the **Channel Setup** windows.

The specific combination of channels needs to match the filter set currently in place:

- BLUE, GREEN, ORANGE, FAR RED
- BLUE, GREEN, RED, FAR RED
- CFP, YFP, mCHERRY



Add Channel

Exposure Time

Illumination Intensity





## Region Tiling

## A. Stage Area Preview

The **Stage Preview Window** allows you to generate a **multi-field stitch** in one color at a time with the  icon.

## Set number of fields

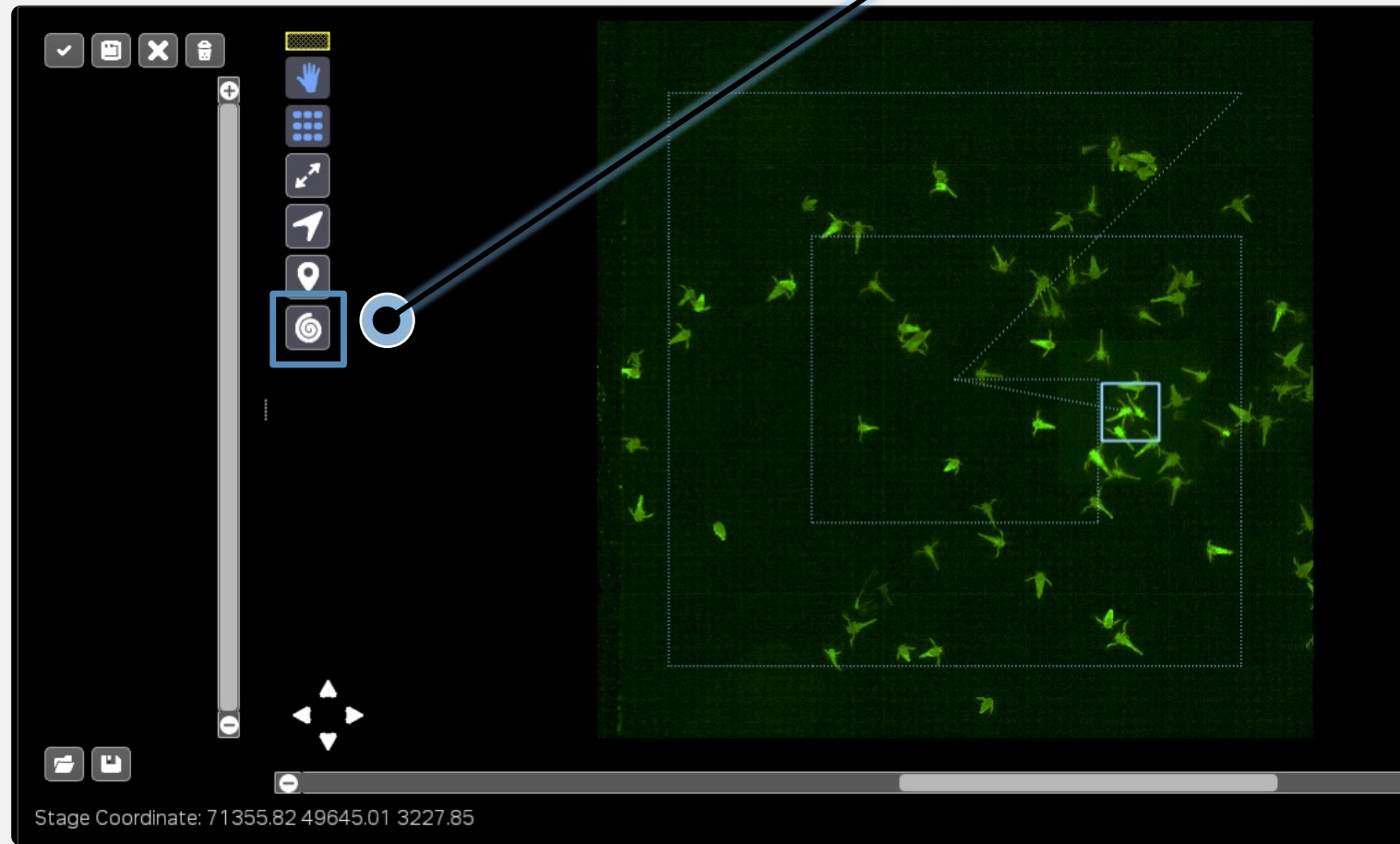
3x3

5x5

7x7

9x9

## Run Preview Spiral Scan



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# Region Tiling

## B. Tiled Acquisition

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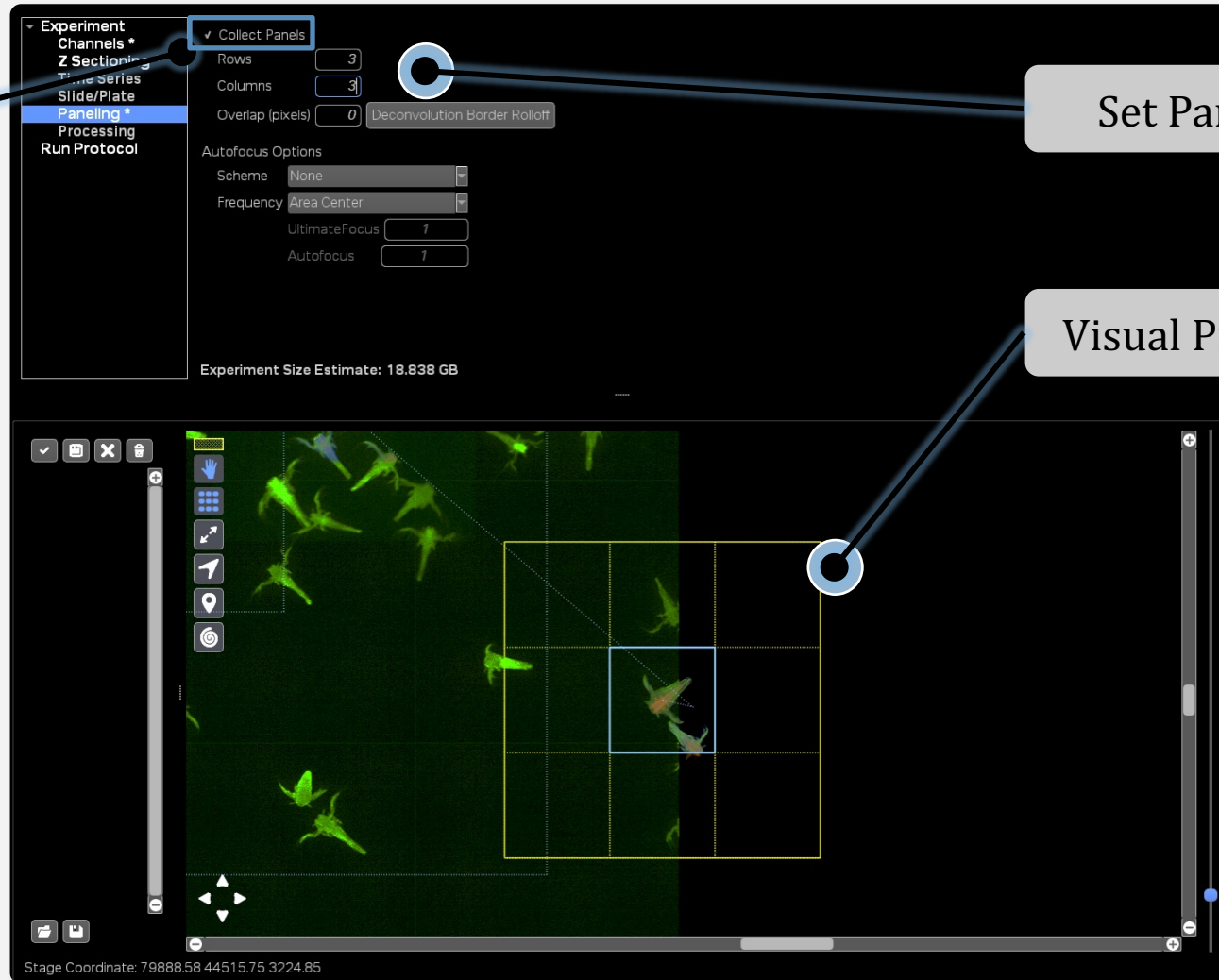
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Enable Paneling Option



Set Paneling Dimensions

Visual Preview of Tiled Area

# Z-Stacking

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**1 Setting the Range**


Navigate to the Top and **ASSIGN TOP** 

Navigate to the Bottom and **ASSIGN BOTTOM** 

*Once assign, the TOP and BOTTOM limits will be shown as **YELLOW** marks on the manual focus bar*

**2 Stack Parameters**

Select "**Do Z Stacking**"


Click  to import the defined range

Adjust settings as needed.

**Experiment Channels \***

- Z Sectioning \*
- Time Series
- Slide/Plate
- Paneling
- Processing
- Run Protocol

Do Z Scanning

Sample Thickness:  

Z Section Spacing:   $\mu\text{m}$

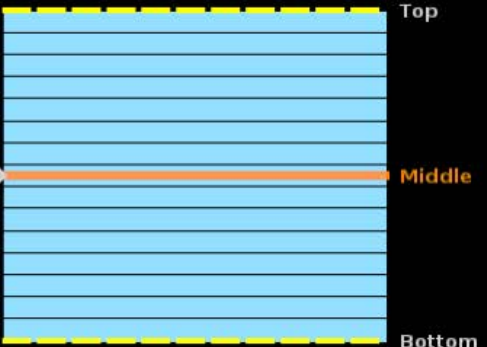
Number of Sections:

Focus Point When Scan Starts:

Image Scan Sequence:

Open Shutter for Each:

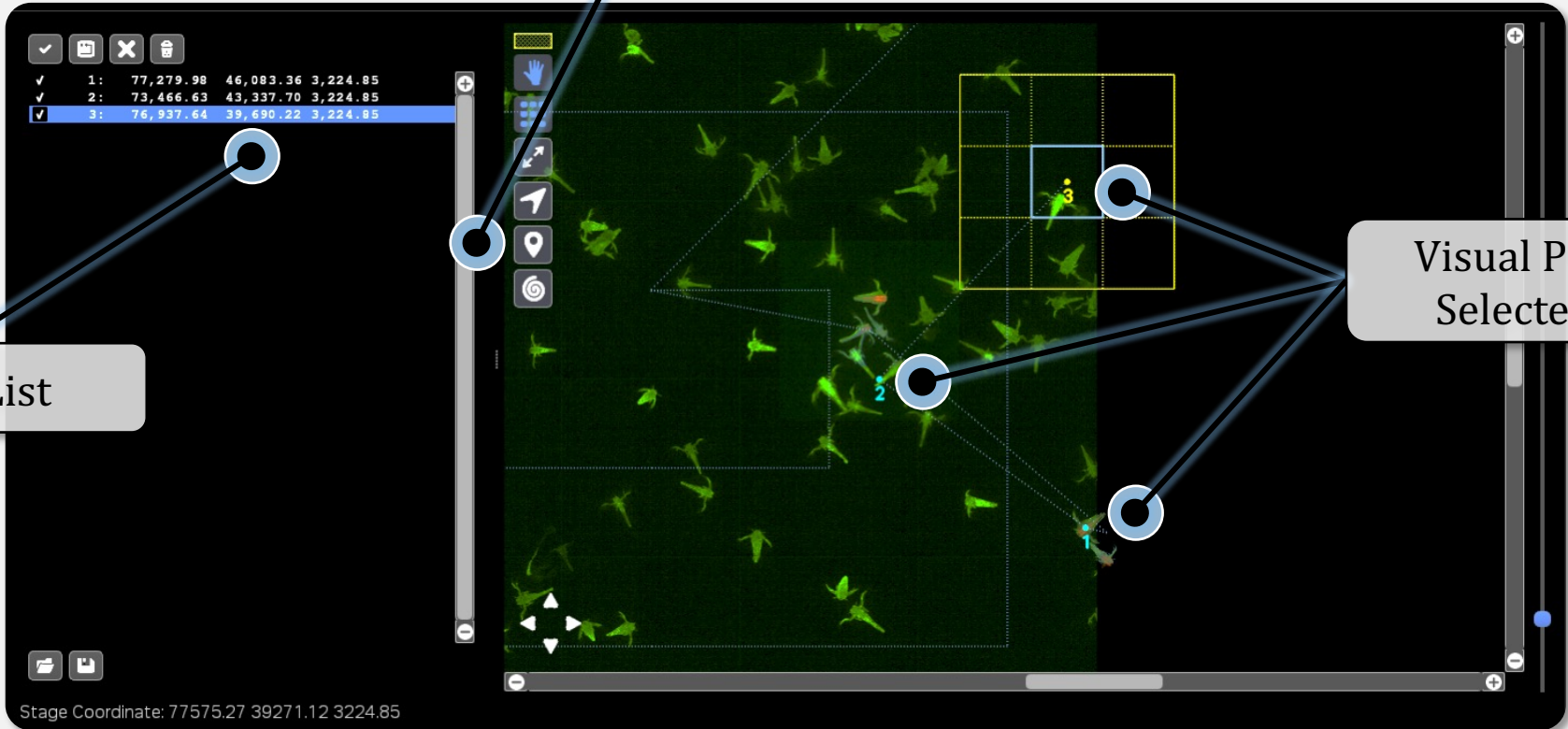
Enable OAI Scan



## Multi-XY

To enable **Multi-point acquisitions**, select  Do Point Visiting from the **Experiment Setup Window**

CLICK  to add points to the list



The screenshot displays the software interface with a point list on the left and a microscopy image on the right. The point list contains three entries, with the third entry selected. The microscopy image shows a field of green fluorescent spots, with three points marked and numbered 1, 2, and 3. A yellow box highlights the area around point 3. A callout box labeled 'Visual Preview of Selected Points' points to the three marked points on the image.

Point List

✓	1:	77,279.98	46,083.36	3,224.85
✓	2:	73,466.63	43,337.70	3,224.85
✓	3:	76,937.64	39,690.22	3,224.85

Visual Preview of Selected Points

Stage Coordinate: 77575.27 39271.12 3224.85

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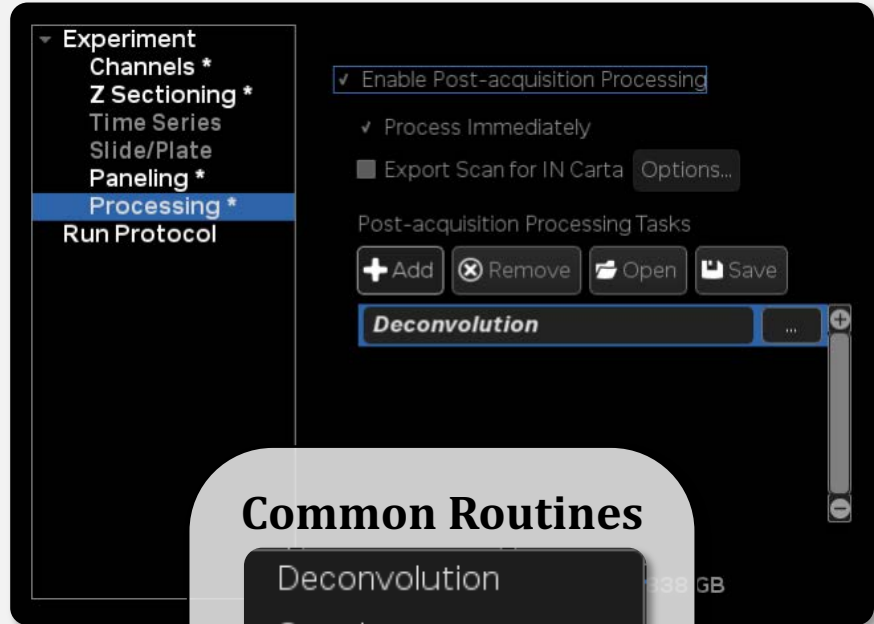
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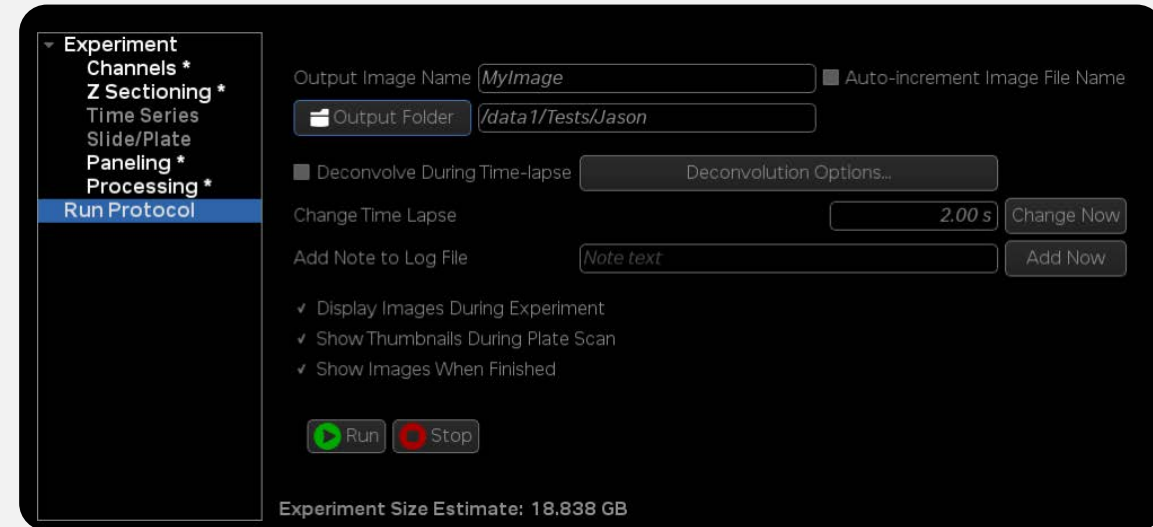
## Post-Acquisition Routines

To automatically run **Post-acquisition Processing**, select the specific process you wish to run and set its parameters.

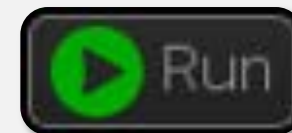


### Common Routines

- Deconvolution
- Crop Image
- Quick Projection
- Volume Rendering
- Stitch
- Export as TIFF
- Custom



To **run your experiment**, define the saving path and click:



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