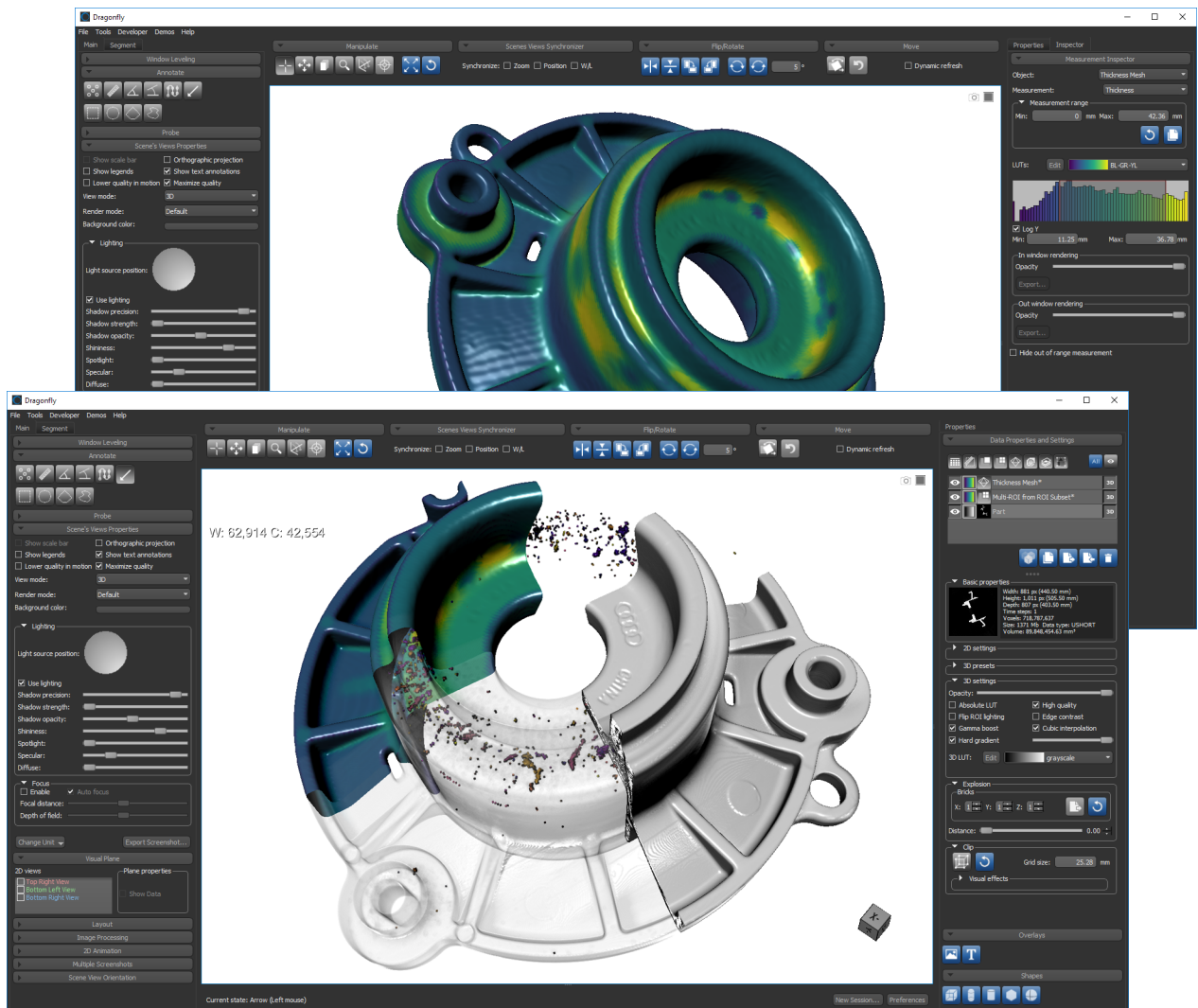




DRAGONFLY RELEASE NOTES



VERSION 3.6

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Title	Dragonfly Release Notes
Release date	2018.06.08
Reference number	TM021-A-04

Release Notes

Version 3.6

This document describes the new features, product enhancements, and other improvements implemented in the Dragonfly and Dragonfly Pro 3.6 software release. You should read these release notes carefully before you install this new version.

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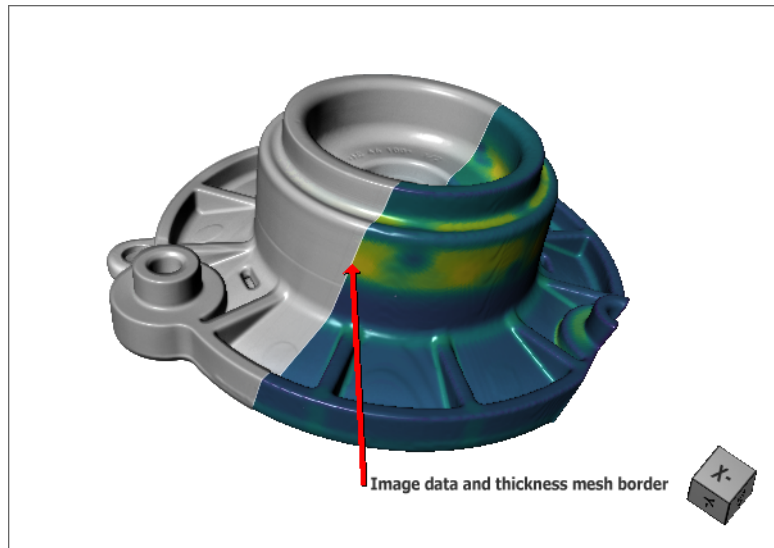
New Features

The 3.6 software release for Dragonfly and Dragonfly Pro provides the following new features. For information about product enhancements and other changes, such as improved TXM file import, additional options for exporting screenshots, and a list of Macro player updates, see [Product Enhancements and Other Changes](#) on page 15.

Arrow Annotation

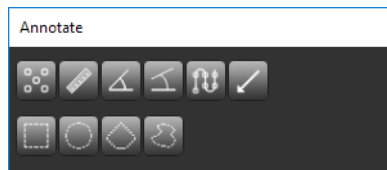
You can use the new Arrow annotation as a pointer to call attention to a certain specimen feature or to indicate a particular area of interest on 2D and 3D views. Arrow annotations can be included in animated sequences and will appear in exported screenshots. You should note that by default, captions are not added to arrow pointers. However, you can add text manually after you create the annotation.

Arrow annotation



The Arrow annotation is available on the Annotate panel, shown below.

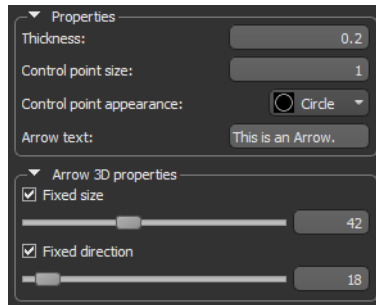
Annotate panel



The properties available on the Data Properties and Settings for modifying the appearance of an Arrow annotation include its thickness and the style of its control points, as well as the text that will appear with the annotation. In 3D views, you can choose to set the size of the annotation and its direction. If these options are not set, then the size or orientation of the annotation will be adjusted automatically for the best fit as the view is zoomed and rotated.

The properties for a selected Arrow annotation are available in the Properties box, as shown below.

Arrow properties



NOTE The color applied to an Arrow annotation is selectable in the object list. In addition, a pop-up menu is available for exporting and looking at the annotation.

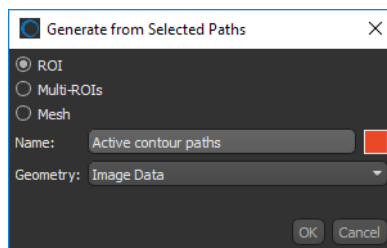
New Options for Active Contours

A number of new options are available in Dragonfly 3.6 for working with Active Contour paths and sets. You can now export Active Contour sets directly to an ROI or multi-ROI, generate a new set of Active Contour paths from an ROI or multi-ROI, as well as limit a cut to selected Active Contour paths.

Export Active Contour Sets

Active Contours sets can be exported directly to ROIs and multi-ROIs, either as outlines that are one pixel wide or as a completely filled object. In addition, the options in the Generate from Selected Paths dialog, shown below, lets you assign a unique name, color, and shape to an generated ROI, multi-ROI, or mesh.

Generate from Selected Paths dialog

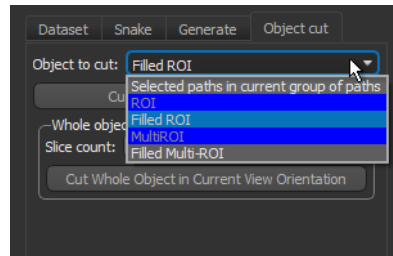


Generate Active Contour Paths

In previous editions of Dragonfly, you could cut a mesh in the current view orientation to generate a new set of Active Contour paths. This functionality is updated to include regions of interest and multi-ROI to the list of objects you can cut.

You can choose the object to cut in the drop-down menu shown in the following screen capture.

Object to cut options



Cut Selected Active Contour Paths

This new option lets you limit a cut to a set of the selected paths.

Additional Image Filters

The following new filters are available in this software release for processing image data and for creating classifiers for trainable segmentation.

Denoising Filters... The newly added **Tv_bregman** filter performs total-variation denoising using split-Bregman optimization, while the newly added **Tv_chambolle** performs total-variation denoising on n-dimensional images.

The principle of total-variation denoising is to minimize the total variation of the image, which can be roughly described as the integral of the norm of the image gradient. Total variation denoising tends to produce “cartoon-like” images, that is, piecewise-constant images. Refer to http://en.wikipedia.org/wiki/Total_variation_denoising for more information about the principle of total-variation denoising.

NOTE The code for the **Tv_chambolle** filter is an implementation of the algorithm of Rudin, Fatemi and Osher that was proposed by Chambolle in *An algorithm for total variation minimization and applications*, Journal of Mathematical Imaging and Vision, Springer, 2004, 20, 89-97.

Hessian Filter... This software release adds a **Hessian** filter for finding continuous edges in an image. Almost equal to Frangi filter, this filter is implemented with an alternative method for smoothing.

Thresholding Filters... Available for thresholding operations, the Niblack, Sauvola, and Triangle filters are designed to output an image composed of two basic classes — foreground and background. The **Niblack** filter applies a Niblack local threshold to an array, while the **Sauvola** filter uses a modification of the Niblack technique. The **Triangle** filter returns a threshold value based on the triangle algorithm.

New Options for Image Data

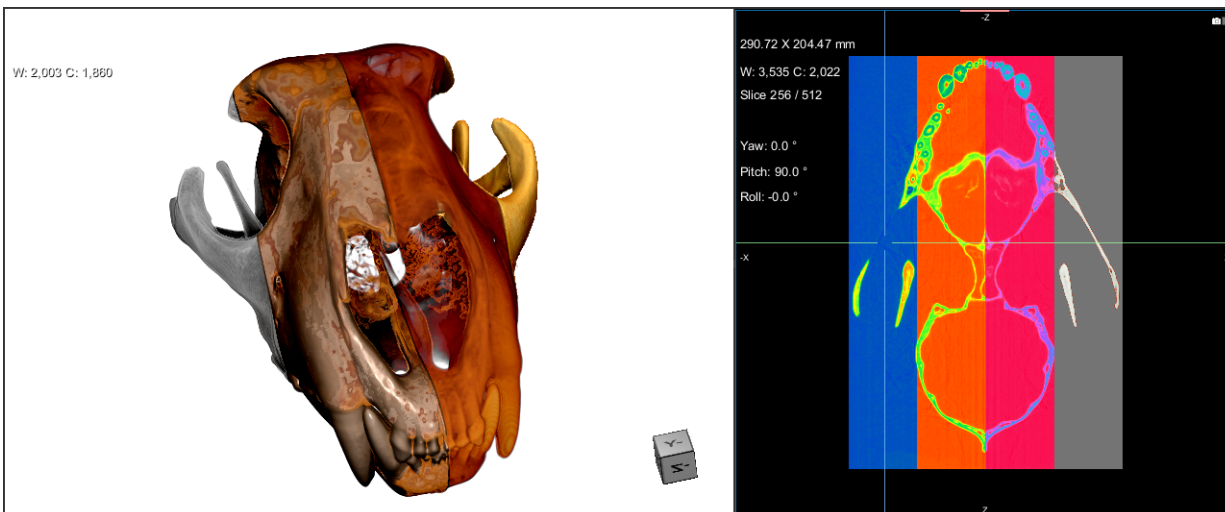
This software release includes an **Export** button on the Explosion panel for exporting the image bricks of an exploded dataset as individual datasets.

Explosion panel



The selectable parameters include the number of bricks in the X, Y, and/or Z direction. You should note that the position in space of each exported brick will be calculated so that the constituent parts can be reassembled coherently. In the example below, the original image data that was exploded into four bricks was reassembled in a 3D and 2D view.

Datasets exported from the Explosion panel and then displayed in the same views

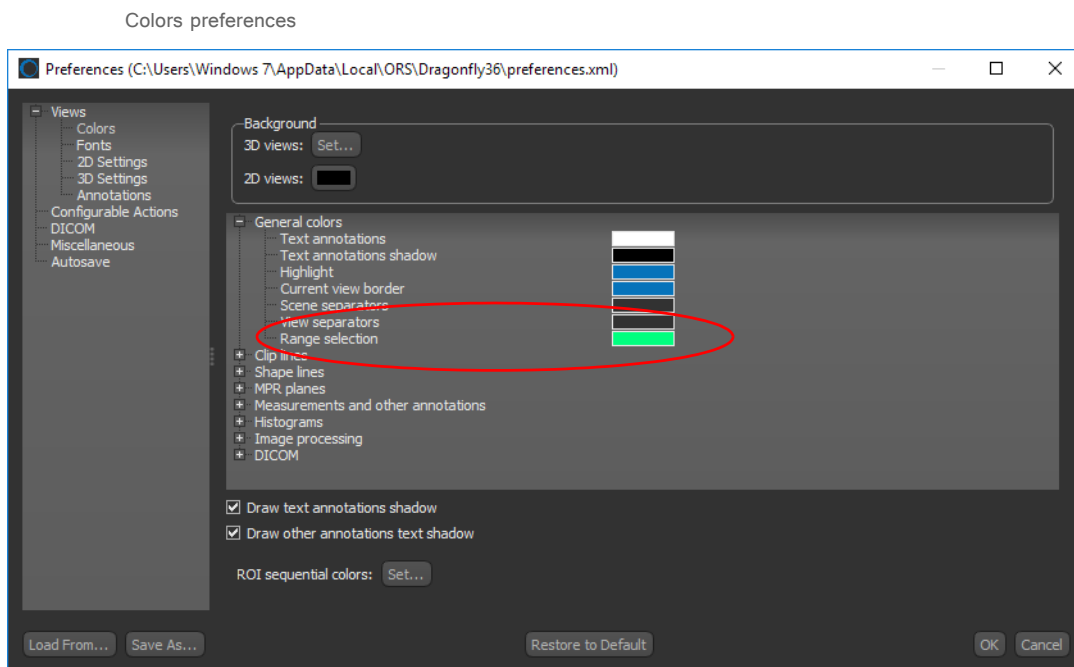


New Options for Regions of Interest

A number of new options are available in Dragonfly 3.6 for working with regions of interest.

Selectable Color for Range Selections

In previous versions of Dragonfly, intensity range selections made in the Range box on the ROI Tools panel were highlighted a constant red. In this software release, the highlight color denoting the selected intensity range is selectable in the Colors preferences. This preference is circled on the following screen capture of the Preferences dialog.

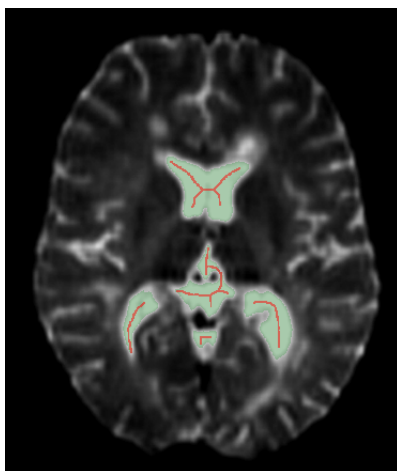


You should note that a defined intensity domain of image data values can be used to create new regions of interest and are also applicable to the ROI Painter tools, morphological operators, and clipping tools. In this context, only voxels that correspond to a value within the range will be affected by any applied operation.

Skeletonize ROI

This new feature for Dragonfly 3.6 lets you reduce each connected component in a region of interest to a single-voxel wide skeleton. Right-click an ROI and then choose **Get Skeleton of ROI** to create a skeleton of the selected region of interest, as shown below.

Original ROI (green) and skeletonized ROI (red)



NOTE Refer to http://scikit-image.org/docs/dev/api/skimage.morphology.html?highlight=skeleton%20d#skimage.morphology.skeletonize_3d for information about the implementation of this feature.

New Options for Multi-ROIs

A number of new options are available in Dragonfly 3.6 for working with multi-ROIs. These new features are described in the following topics.

Cyclical LUT Colors for Labels

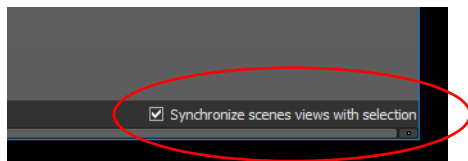
Whenever "Label" is displayed as the scalar measurement for a multi-ROI, the selected LUT will now be applied as a periodic or cyclical color map. This means that when labels are mapped to a color map of k discrete colors, labels 1 through k are mapped to those colors. Labels $k+1$ through $2*k$ are mapped to the same colors, while labels $2*k+1$ through $3*k$ are mapped to those same colors and so on.

This periodic (or cyclical) color map should make it easier to visually resolve different labels in a multi-ROI.

Synchronize Scenes Views with Selection

In order to let you quickly find objects in a multi-ROI, you can now synchronize selections made in the Object Analysis dialog with the MPR views shown in the workspace. This setting, circled below, is available on the lower right corner of the Object Analysis dialog.

Object Analysis dialog



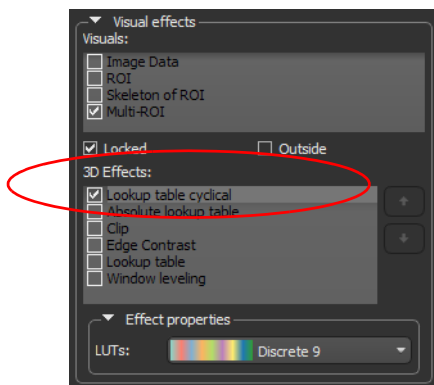
This default synchronization option does the following:

- When a row in the Object Analysis table is selected, the MPR views are re-centered on the unweighted center-of-mass of the selected item.
- When an object is selected in an MPR view, the list is focused on the selected item.

Additional Visual Effects

In this Dragonfly release, the options for the visual effects that can be applied to shapes, regions of interest, and clipped regions now include a cyclical lookup table (LUT) function. This option is circled below.

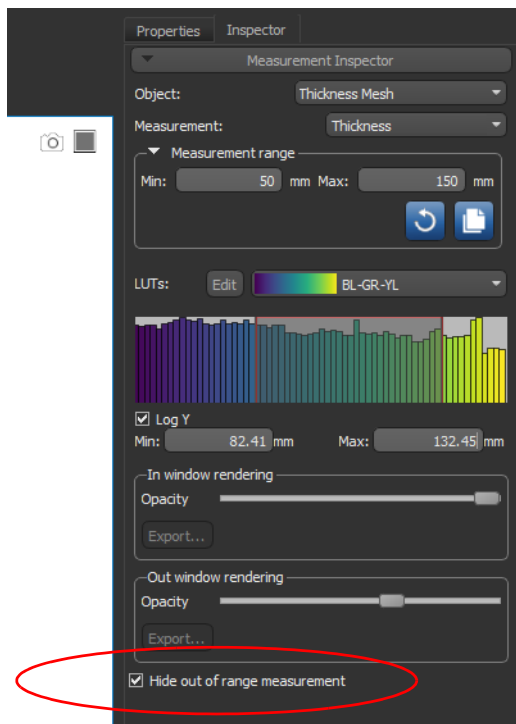
Visual effects options



New Options for the Measurement Inspector

Whenever you work with selected measurement ranges, you can now choose to show or hide measurements that fall outside the In window rendering range. This new option for the Measurement Inspector is circled below.

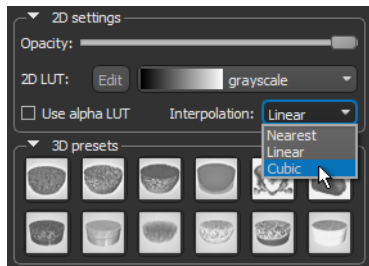
Measurement Inspector



2D Settings

This Dragonfly release includes the option to apply tricubic interpolation to image data that is shown in 2D views. As shown below, the 2D interpolation options — Nearest, Linear, and Cubic — are available in the 2D settings box on the Data Properties and Settings panel.

Interpolation options for 2D views

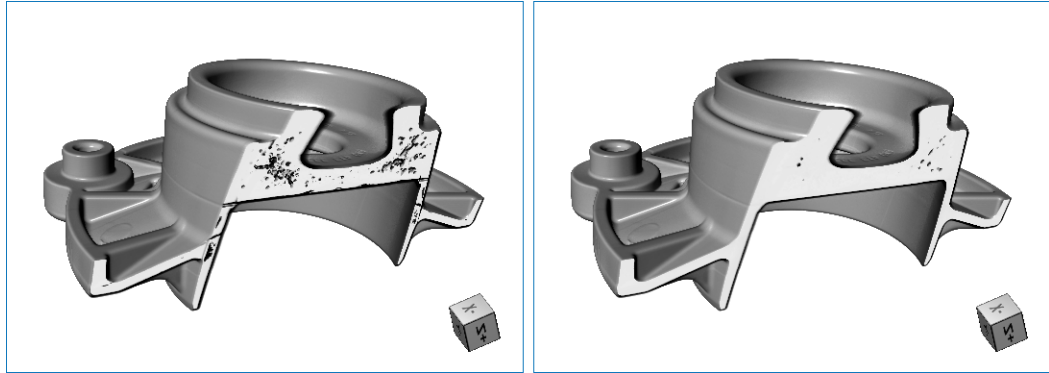


TM021-A-04

3D Settings

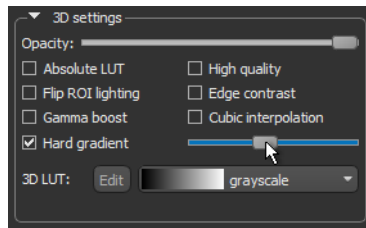
This Dragonfly release adds the option to adjust the hard gradient setting that is available for image data shown in 3D views. As shown below, adjustments with the slider can help you clean-up visualizations that are affected by noise.

Progressive hard gradient adjustments



As shown below, the Hard gradient setting and adjustment slider are available in the 3D settings box on the Data Properties and Settings panel.

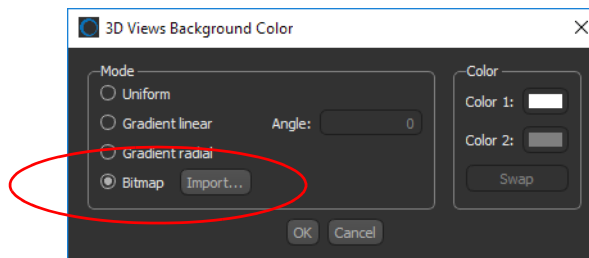
Slider for Hard gradient setting



3D Views

You can now choose to apply an image as the background of 3D views. This option is available in the 3D Views Background Color dialog, as shown below.

3D View Background Color dialog



NOTE A background image for 3D views can be set as a preference or changed temporarily in the Scene's Views Properties panel.

New Options for Selected Objects

The following new options — **Create a Box from Current Bounding Box** and **Create a Box from Current Box** — are available for image data, regions of interest, multi-ROIs, and meshes in the Data Properties and Settings panel pop-up menus. These new options can help maintain consistency between different objects.

Additional Support for CZI Files

For Dragonfly Pro users, this software release provides the option to export image data in the CZI file format from the Data Properties and Settings panel. CZI is a proprietary format used by ZEISS microscopes to save data, such as image stacks and time lapse series. Contact Object Research Systems for information about the availability of Dragonfly Pro.

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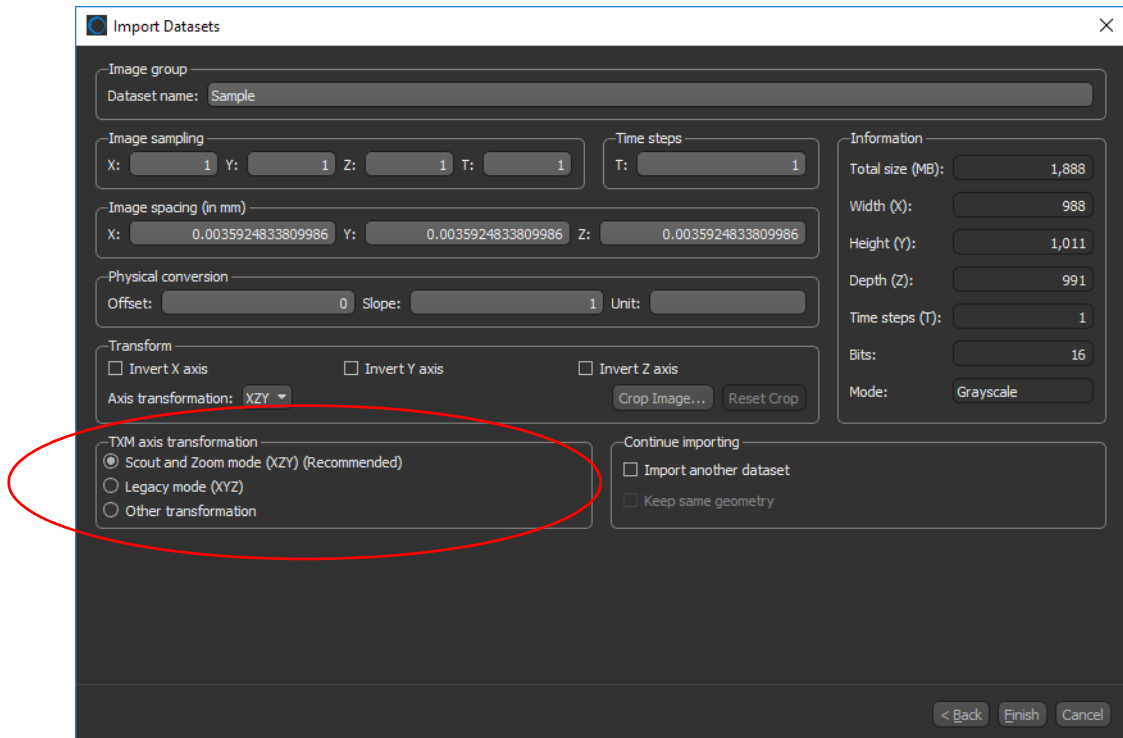
Product Enhancements and Other Changes

This release provides the following product enhancements for Dragonfly and Dragonfly Pro. For information about new features, such as the Arrow annotation, additional filters for image processing and the Segmentation Trainer, as well newly implemented options for image data, regions of interest, and multi-ROIs, see [New Features](#) on page 5.

Improved TXM File Import

TXM files are encoded with the ZEISS Xradia stage coordinates and they use a XZY matrix encoding. In order insure that TXM files automatically appear in the orientation consistent with the ZEISS Xradia stage, Dragonfly Pro users can now choose **Scout and Zoom mode (XZY)** during a file import operation. This option is available in the TXM axis transformation box, circled below.

Import Datasets dialog



Other options in the TXM axis transformation box include the following:

Legacy Mode (XYZ)... Will import your TXM file with standard XYZ matrix decoding. This was the default behavior for all releases of Dragonfly Pro prior to version 3.6.

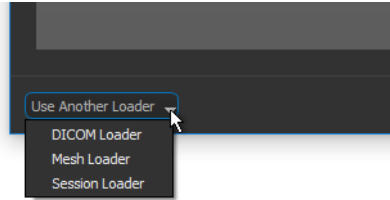
Other Transform... If selected, then a ZYX axis transformation will be applied. You should note that you can also make your adjustments in the Axis transformation dropdown menu in the Transform box that is available for all file formats.

NOTE This option is available for Dragonfly Pro only. Contact Object Research Systems for information about the availability of Dragonfly Pro.

Switching Loaders

This software release adds the option to choose a different loader — DICOM Loader, Mesh Loader, or Session Loader — in the Import Datasets dialog.

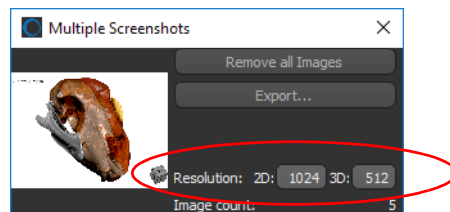
Import Datasets dialog



Updates for Exporting Multiple Screenshots

The Dragonfly 3.6 release includes the option to select different resolutions for exporting images captured from 2D views and from 3D views.

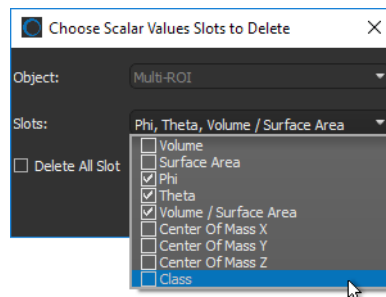
Multiple Screenshots panel



Additional Options for Managing Scalar Information

Whenever you need to manage the scalar information contained in a multi-ROI or mesh, you can now select multiple scalar value slots whenever you need to delete slots, map scalar values from another object, or copy scalar values.

Choose Scalar Value Slots to Delete dialog



Point Set Export for JSON

You should note that in this software release, the length units of Points annotation data (Scout and Zoom tags) that are exported in the JSON file format are automatically encoded in micrometers with a precision of two decimal points. You should note that this will be applied regardless of the Preferences settings for the default unit or significant digits for measurements.

In this scheme, a measurement of 5.2 mm will be exported as 5200.00 μm , 3.762834 mm as 3762.83 μm , 3.762837 mm as 3762,84 μm , and so on.

Animating Object Movements in the Movie Maker

In this software release, Movie Maker keyframes now encode the position and orientation of objects such as image data, regions of interest, multi-ROIs, and shapes. If values are different between sequential keyframes, then that object will be translated or rotated during that keyframe interval.

With this additional information, it is possible rotate an object regardless of whether the camera is stationary or being animated.

NOTE You should note that support for meshes will be available in a future software release.

Macro Player Updates

A number of updates for the Macro Player are available in this 3.6 product release. These updates include the following:

- The current step being executed is highlighted.
- Steps are fully selectable when playing/editing a macro.
- The progress of the macro is shown during execution.
- The macro path specification was added as the argument of the filename in the compile call instead of 'string'.

Developer Documentation

The developer documentation for Dragonfly has been updated for version 3.6. Choose **Help > Dragonfly Developer Documentation** on the menu bar to open the documentation system.

Menu Item Changes

The following changes and new menu items are implemented for Dragonfly 3.6.

Dataset Pop-Up Menu

A number of new items, listed below, and other changes have been implemented for the dataset pop-up menu. These are listed below.

Dataset pop-up menu changes

	Description
Export as CZI	Lets Dragonfly Pro users export image in the CZI file format. See Additional Support for CZI Files on page 13.
Create a Box from Current Bounding Box	Lets you create a box that corresponds to the dimensions of the current bounding box.
Create a Box from Current Box	Lets you create a box that corresponds to the dimensions of the current box.

Region of Interest Menu

A number of new items, listed below, and other changes have been implemented for the region of interest pop-up menu. These are listed below.

Region of interest pop-up menu changes

	Description
Get Skeleton of ROI	Lets you reduce each connected component in a region of interest to a single-voxel wide skeleton. See Skeletonize ROI on page 9.
Create a Box from Current Bounding Box	Lets you create a box that corresponds to the dimensions of the current bounding box.
Create a Box from Current Box	Lets you create a box that corresponds to the dimensions of the current box.

Multi-ROI Menu

A number of new items, listed below, and other changes have been implemented for the multi-ROI pop-up menu. These are listed below.

Multi-ROI pop-up menu changes

	Description
Create a Box from Current Bounding Box	Lets you create a box that corresponds to the dimensions of the current bounding box.
Create a Box from Current Box	Lets you create a box that corresponds to the dimensions of the current box.

Mesh Pop-Up Menu

A number of new items, listed below, and other changes have been implemented for the pop-up menu for meshes. These are listed below.

Mesh pop-up menu changes

	Description
Create a Box from Current Bounding Box	Lets you create a box that corresponds to the dimensions of the current bounding box.

Preferences Changes

Colors Preferences

Changes for the Colors preferences are indicated in the following table.

Colors preferences

	Description
Background	3D views. Lets you select a bitmap as the background for 3D views.
General colors	Range selection. Lets you select the highlight color for a selected intensity range.

System Requirements Changes

This release supports the base system requirements. Any differences in those requirements are noted below.

System requirements changes

Version	Changes to system requirements
3.0.0	None.
3.1.0	None. NOTE Dragonfly 3.1 includes a new Anaconda distribution for Python. You should note that the current version of Python accessed by Dragonfly will be updated automatically to version 3.6 when you install this new release.
3.5.0	None.
3.6.0	None.

Extending Dragonfly

Dragonfly's Infinite Toolbox, an open exchange platform for the Dragonfly user community, lets you submit, browse, and download extensions that implement new features and workflows for all of your image processing or analysis needs.

Choose **Tools > Infinite Toolbox** on the menu bar to open Dragonfly's Infinite Toolbox.

Getting Help

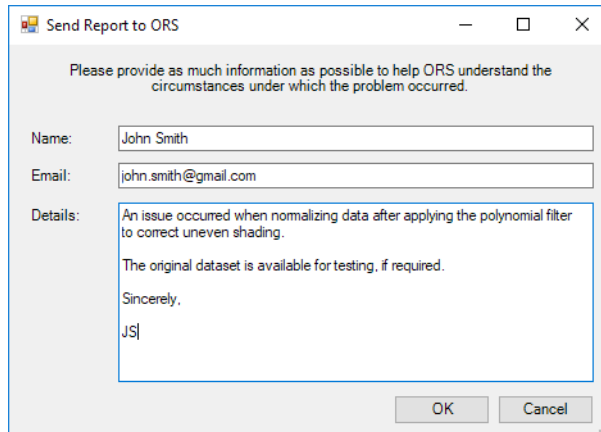
Learning Dragonfly

Just by taking a quick look around www.theobjects.com/dragonfly, you'll find some great free resources, such as our latest instructional videos, recorded webinars, and user forums.

Reporting Issues

Dragonfly includes an integrated reporting module that lets you include comments and other information along with generated DMP and log files whenever you encounter an issue that results in a crash or application freeze.

Send Report to ORS dialog



You should note that you can also report an issue at any time by choosing **Help > Report an Issue** on the menu bar.

Request a New Feature

Let us know if you have a suggestion for a new feature, or an idea for an improvement to an existing workflow.